THE MONETARY APPROACH TO BALANCE-OF-PAYMENTS

Yoshinori YOKOI

Introduction

The balance-of-payments of a conntry has been an important problem since the days of David Hume. Voluminous literature has been produced on the concepts, the theories, and the policies of the balance-of-payments.

More recently in the 1950s and 1960s, in connection with the "Dollar Shortage" and the "Dollar Glut," various concepts of the balance of payments such as the current account balance, the basic balance, or the net liquidity balance were proposed and widely discussed.(1)

The official settlements balance was chosen by the late Professor Harry G. Johnson as the most appropriate concept for his analysis of the monetary approach to the balance of payments.

He wrote:(2)

> The main characteristic of the monetary approach to the balance of payments can be summarized in the proposition that the balance of payments is essentially a monetary phenomenon. The term, "the

(1) For a succinct discussin of these concepts, see Leland B. Yeager, *International Monetary Relations: Theory, History, and Policy*, 2nd ed., Harper and Row, 1976, pp. 38—56.

(2) Jacob A. Frenkel and Harry G. Johnson, "The Monetary Approach to the Balance of Payments Essential Concepts and Historical Origins," Frenkel and Johnson eds., *The Monetary Approach to the Balance of payments*, George Allen and Unwin, 1976, p. 21.

balance of payments" refers to items that are "below the line" in the overall balance of payments (which must balance exactly, by the principles of double-entry accounting); the items in question constitute the "money account."

Specifically, the "money account" is measured by the following below-the-line items for the United States:

Changes in U. S. reserve assets (gold, convertible foreign currencies, reserve position in the I. M. F., and SDR's)

Changes in U. S. liquid liabilities to foreign official agencies

Changes in U. S. nonliquid but readily marketable liabilities (including long-term liabilities of U. S. banks) to foreign official agencies

Changes in U. S. government nonliquid liabilities to foreign official reserve agencies.

The sum of these changes measurs what happened to the country's international reserves—increased, decreased or remained unchanged. The balance-of-payments figures, however, do not tell us anything about the factors affecting these figures. It is the function of the balance-of-payments theory to discover the laws that regulate important economic variables on the one hand and the balance-of-payments on the other. And the balance-of-payments policies should be based on the "right" theory. If not, the policies will fail. In the following sections, we will critically examine recent development in the theory of the balance-of-payments which is designated as "The Monetary Approach."(3) Throughout

(3) Harry G. Johnson, "Towards a General Theory of the Balance of Payments," and
_____, "The Monetary Approach to Balance-of-Payments Theory," both in Frenkel and Johnson, *op. cit.*, pp. 46—63 and pp. 147—167 respectively.
_____, "The Monetary Approach to the Balance of Payments: A Non-

this article, we shall be concerned with the fixed exchange rate system.

One Good - Two Money Model

I will draw on the work of Professor Alexander K. Swoboda in this section.(4)

Assumptions:

1. The country is so "small" that it can sell and buy whatever quantity of a commodity to and from the rest of the world.
2. The country produces and consumes only one good, i.e., an exportable good.
3. Money is the only asset. (There is no market for bonds or physical capital.)
4. The demand for real balances is a stable function of a few variables, say, real income.
5. All prices including wages are flexible. (Full employment is guaranteed.)
6. Perfect international commodity arbitrage assures the "law of

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technical Guide," *Journal of International Economics*, 7 (1977), pp. 251—268.

Thomas M. Humphery, "A Monetarist Model of World Inflation and the Balance of Payments," *Economic Review: Federal Reserve Bank of Richmond*, (November / December 1976), pp. 13—22.

Donald S. Kemp, "A Monetary View of the Balance of Payments," *Federal Reserve Bank of St. Louis Review*, (April 1975), pp. 14—22.

Alexander K. Swoboda, "Monetary Approaches to Balance-of-Payments Theory" E. Claassen and P. Salin eds., *Recent Issues in International Monetary Economics*, North-Holland Publishing Company, 1976, pp. 3—23.

Marina V. N. Whitman, "Global Monetarism and the Monetary Approach to the Balance of Payments," *Brookings Papers on Economic Activity*, 3, 1975, pp. 491—536.

(4) Alexander K. Swoboda, *op. cit.*, *pp.* 16—19.

one price."

7. The exchange rate is fixed and equal to unity.
8. Net investment does not take place.
9. Population, taste, and technology do not change.

At this point, the reader is advised to ponder what kind of world we shall be considering. What are the major economic decisions that have to be made by the residents of this hypothetical "small" country under these assumptions? Assumptions 1 and 6 in combination determine the commodity price. Both producers and consumers can take this price as exogenously "given." The producers determine what quantity of the commodity shall be produced and sold at the given price so that their profit may be maximized. It should be noted that these producers need not worry about the undesired inventory accumulation. Whatever quantity they may produce, the outlet for the product is assured always by the rest of the world. A discrepancy between ex-ante and ex-post production never arises. The consumers determine how much good to consume so that their utility may be maximized. However, the commodity price may change at any moment depending on the world demand and supply. There is uncertainty about the future course of price. Therefore, people must hold real balances not only for transaction but also for precautionary motives.

What about the government of the small country? The government is assumed to stick strictly to "the balanced budget" principle, and defend the exchange rate.

The working of this economic system can be described by the following equations.[5]

(5) Alexander K. Swoboda, *op. cit.*, pp. 16—18. Notations and numbering of

The Model

$$M^d = kP\bar{Y} \qquad (2-1)$$

$$M^S = D + R \qquad (2-2)$$

$$M^d = M^S, \qquad (2-3)$$

$$B \equiv \bar{Y} - A \qquad (2-4)$$

$$A = \bar{Y} - \alpha\left(\frac{M^d}{P} - \frac{M^s}{P}\right) \qquad (2-5)$$

$$B \equiv \frac{1}{P}\frac{dR}{dt} \equiv \frac{1}{P}\frac{dM}{dt}, \qquad (2-6)$$

where

M^d: nominal quantity of money demanded

k : Cambridge k

P : the price, in home currency, of the good

$\bar{Y}$: physical quantity of the good produced at full employment

M^S: nominal quantity of money supplied

D : domestic assets backing the money supply

R : foreign assets backing the money supply, i.e., nominal quantity of international reserves held by the small country

B : balance-of-payments in real rerms

A: absorption (or desired expenditure) in real terms.

Equation (2-1) states that the demand for real balances is a stable function of real income. If we assume that k is not volatile over time, the nominal demand for money in this case reduces to a simple function of P only since $\bar{Y}$ is fixed at the full employment level of output. Here, we may note that the neutrality postulate must always be satisfied in this model. Equation (2-2) specifies the money supply process under the fixed exchange rate system. The money supply can

the equations are changed for convenience of exposition.

be changed through two channels: one through domestic credit creation (i.e., through change in D component) and the other, through the balance-of-payments (i.e., the change in R component). For simplicity, D is assumed to be kept unchanged. Epuation (2-3) is the equilibrium condition for the domestic money market. Is this market always in equilibrium? Not necessarily. With Assumption 3, international capital movements have been assumed away. Therefore, equation (2-4) defines the balance-of-payments as the excess supply of the domestic good of the small country. As noted earlier, this excess supply does not cause any difficulty to the domestic producers. The rest of the world functions like a large reservoir. Equation (2-5) is the engine, the driving force, of this simple model. It stipulates the expenditure function whose arguments are real income and real balances. With real income fixed, with the nominal quantity of money supply predetermined, with the demand for the nominal quantity of money determined by equation (2-1), and with P which is exogenously "given," the only meaningful determinant of the real absorption (expenditure) is, α, the speed of adjustment. Professor Swoboda says that α has the time dimension, (1/time), to make the equation (2-5) dimensionally consistent. Finally, equation (2-6) states that the balance-of-payments in real terms is equal to the change in the international reserves in real terms which, in turn, is equal to the change in real balances.

To get this model going, we must specify the nominal quantity of money supply—any arbitrary quantity will do. As soon as we are told that P is exogenously given, $\bar{Y}$ is fixed, and k is stable, we know that the desired quantity of money holding is also fixed. It varies beautifully in direct proportion to P. The α in equation (2-5) determines

the level of expenditures. This determines automatically how much of the good can be sold in the domestic market. The leftover or the deficient quantity of the good is immediately taken care of by the rest of the world. As soon as the desired stock of money is satisfied through the balance-of-payments, the whole system of this model reaches a stationary state. The balance-of-payments is determined completely by the size of A—nothing but A.

We may represent the working of this model schematically as follows:

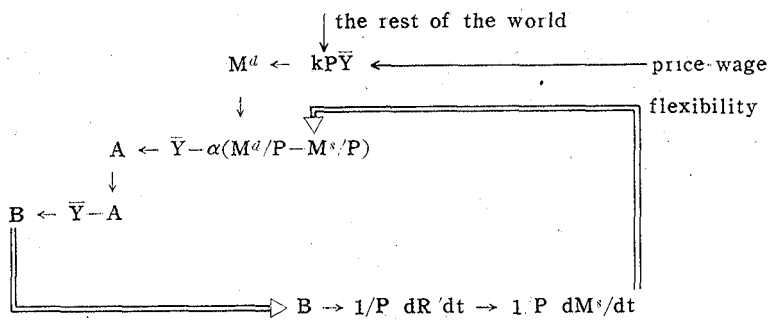

Figure 1. The Mechanism of Automatic Adjustment Process

The question whether this system converges or not depends on the sign of the adjustment speed, α. If α is positive, the dynamic stability of the model is assured.(6) From the kind of model and analysis sketched above, Professor Swoboda drew the following conclusions:(7)

> In spite of its simplicity, this model puts into sharp relief several features of the monetary process of adjustment under fixed exchange rates that were discussed in previous sections of this paper:
>
> (1) Given reasonable behavior parameters, [$\alpha > 0$], stability ("automaticity") of the monetary process of adjustment under fixed exchange rates is insured and money is neutral in equilibrium.

(6) Alexander K. Swoboda, *op. cit.*, pp. 18—19.
(7) *Ibid.*, p. 20.

Two features of the model are crucial in generating this result: the link between excess cash balances and the balance of payments (provided by $\alpha > 0$) and the link between the latter and the money supply in [Swoboda's] equation (10). [Equation (2-6) in this text]

(2) This automaticity implies that a payments deficit or surplus is transitory in nature.

(3) The automaticity of the adjustment mechanism can be broken if money does not matter for real behavior ($\alpha = 0$) or if some mechanism prevents payments imbalances from affecting the money stock (e.g., neutralization policy, open market purchases or sales of goods in the simple model).

(4) This model of adjustment is equally applicable to an individual economic unit or region in a single currency area or to a small country under fixed exchange rates (through the Hicksian composite commodity feature of all monies under fixed rates mentioned above). From a theoretical point of view, this implies that many problems of international adjustment under fixed rates can be studied in a manner similar to distributional problems within a single monetary economy. In fact, the model proposed above is very similar in spirit to that used by Archibald and Lipsey in their discussion of Patinkin's work.[8]

(5) This simple model can be used as a first approach to devaluation and imported inflation considered as "essentially" monetary phenomena. Devaluation is treated as an exogenous cut in real cash balances brought about not by a cut in nominal balances but by a rise in the domestic price level since $P^* = eP_f^*$, where e is the price of foreign in terms of domestic currency and P_f^* is the given foreign price level, under the assumption of goods market arbitrage. The adjustment process is exactly that described above though

(8) G. C. Archibald and R. G. Lipsey, "Monetary and Value Theory: A Critique of Lange and Patinkin," *Review of Economic Studies*, 26 (1958), pp. 1—22.

care must be taken to specify the impact effects on the money supply of the devaluation gain of the monetary authorities on the existing stock of reserves. Similarly, imported inflation can be assimilated to an exogenous rise in the foreign price level, P_f^*.

(6) The very simplicity of the model suggests extensions that may be useful. For instance, introduce non-traded goods in addition to traded ones into the model. The domestic price level can then diverge from the foreign one during the adjustment period. To capture its evolution over time, however, requires careful specification as to which markets clear instantaneously and which do not and as to the exact dynamic postulates that are assumed. Similar remarks apply to variations in employment and the terms of trade and to the introduction of securities, expectation functions and two-country models, to mention but a few relevant extensions.

After this long quotation, we discover that "the king is naked." The beginning sentence of this quotation should read, "Because of its simplicity, ..." This model does not dare to face squarely and honestly the balance-of-payments "problem." The most important balance-of-payments problem confronting to any country of any significance, today, is that the domestic producers are unable to sell their products in the quantity they desire. Yet, this model assumes away the difficulties by the "small" country assumption. Since the producers in this hypothetical country are able to sell "whatever quantity they choose" in the world market, we should realize, the balance-of-payments problem does not even exist.

The only serious economic problem that the people in this deceptively simple model have is choosing the speed of asset accumulation which determines how fast they will arrive at the full stock equilibrium "nirvana." By logical necessity, they must arrive at this happy state sooner

or later—automatically—because the model was built to work that way. It is absurd to try to draw any policy implications from this model.

Two Good-Two Money Model

The simple model of the previous section has been modified in various ways by introducing nontraded good,[10] bonds,[11] and the assumption of less-than-full employment.[12] In this section, we will examine the properties of the two good-two money-two country world by dropping the assumption of the "small" country. Our concern here, as in the previous section, is this question: Can a country attain her balance-of-payments equilibrium *automatically*? If so, why is it possible? What are the key assumptions to derive this result? We will use the celebrated article by Professor Dornbusch as our basis of discussions.[13]

At the outset, let us state the fundamental assumptions on which the model rests.

Assumptions:

1. Prices and wages are flexible.

(10) Rudiger Dornbusch, "Devaluation, Money, and Non-Traded Goods," *American Economic Review*, (December 1973), pp. 871—883. Also reprinted in Frenkel and Johnson, *op. cit.*, 1976, pp. 168—186.
_____, "Currency Depreciation, Hoarding, and Relative Prices," *Journal of Political Economy* (July/August 1973), pp. 893—915.
_____, "Exchange Rates and Fiscal Policy in a Popular Model of International Trade," *American Economic Review*, (December 1975), pp. 859—871.

(11) William H. Branson, "Portfolio Equilibrium and Monetary Policy with Foreign and Non-Traded Assets," E. Claassen and P. Salin eds., *Recent Issues in International Monetary Economics*, North-Holland Publishing Company, 1976, pp. 241—250.
Johan Myherman, "Balance of Payments Adjustments and Portfolio Theory: A Survey," Claassen and Salin eds., *op. cit.*, pp. 203—233.

(12) Carlos A. Rodriguez, "Money and Wealth in an Open Economy: Income-Expenditure Model," Frenkel and Johnson, *op. cit.*, 1976, pp. 222—236.

(13) Rudiger Dornbusch, "Devaluation, Money, and Non-Traded Goods," *American Economic Review*, (December 1973), pp. 871—883.

2. Capital goods as well as labor can move freely from one sector of the economy to the other.
3. Net physical investment does not exist.
4. Money is the only asset. (Bonds do not exist.)
5. There are traded goods and non-traded goods. But each class of goods itself is considered a Hicksian composite commodity.
6. Resources, taste and technology are "given."

The model contains three categories of goods: importables, exportables, and non-tradables.(14) However, if we assume that the relative prices among importables and exportables do not change, we may make a single Hicksian composite commodity out of importables and exportables. We call this composite commodity the traded good. Henceforth, the relative price means the relative price between the traded good and the non-traded good.

It is time to describe the building blocks of the model. We will begin with the production function. The assumptions of price flexibility and free resource mobility guarantee that the production in the two countries can take place, at any point, on the transformation curve (TT′ in Fig. 2, p.63) in each country. Given the usual assumptions about this

(14) Many goods and services that a country produces and consumes can be classified as follows:

- goods and services
  - tradables
    - exportables
      - actual exports
      - close substitutes for exports sold at home
    - importables
      - actual imports
      - import-competing goods and services
  - non-tradables

The tradables are those goods and services whose prices are broadly determined in the world market. Non-tradables are those goods and services the prices of which are determined by the domestic demand and supply.

cruve, it is concave to the origin. The production point, Q, is determined by the relative commodity price alone. The production conditions in the home country may be represented by Figure 2.

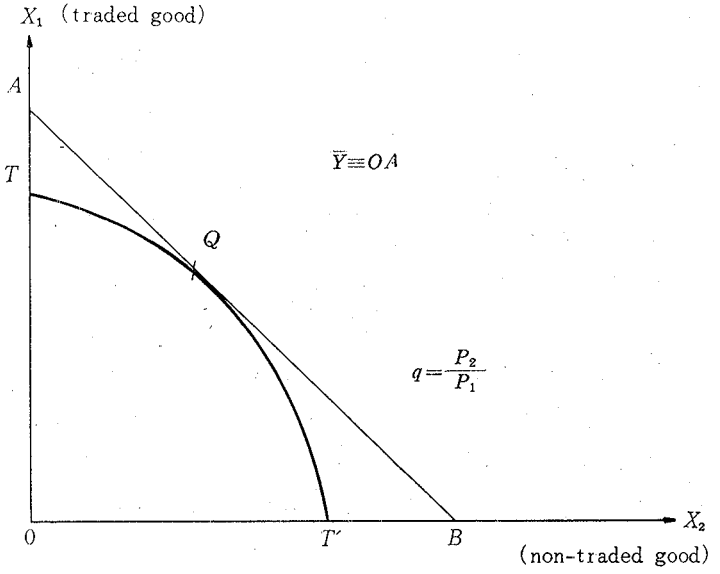

Figure 2. Production in Home Country

Supply of the Goods

$$X_i = X_i(q), \qquad i=1,2 \qquad (3-1)$$

$$X_i^* = X_i^*(q^*),$$

$$q = \frac{P_2}{P_1}, \qquad (3-2)$$

$$q^* = \frac{P_2^*}{P_1^*},$$

$$P_1 = e \cdot P_1^*, \qquad (3-3)$$

where

X_1: the quantity of the traded good

X_2: the quantity of the non-traded good

q : the relative price of the non-traded good in terms of the traded good

P_1: the domestic currency price of the traded good in home country

P_2: the domestic currency price of the non-traded good in home country

e : the exchange rate expressed in units of home currency per unit of foreign currency.

Hereafter, an asterisk refers to the foreign country. Most probably, P_2 differs from $e \cdot P_2^*$ because the non-traded good market in each country is a separate entity. We will take the traded good as the numeraire and the deflator. Any quantity which is deflated by this numeraire has a bar over itself, and is sometimes called a real quantity.

Demand for the Goods

$$C_i = C_i(q, \bar{Z}), \quad i=1, 2 \qquad (3-4)$$

$$C_i^* = C_i^*(q^*, \bar{Z}^*),$$

$$\bar{Z} = \bar{Y} - \bar{H}, \qquad (3-5)$$

$$\bar{Z}^* = \bar{Y}^* - \bar{H}^*,$$

$$\bar{Y} = X_1 + q \cdot X_2 = \bar{Y}(q), \qquad (3-6)$$

$$\bar{Y}^* = X_1^* + q^* \cdot X_2^* = \bar{Y}^*(q^*),$$

where

C_i: the quantity demanded of i-th good[15]

$\bar{Z}$: the expenditures measured in terms of the traded good

$\bar{H}$: the hoarding in home country measured in terms of the traded good

$\bar{Y}$: the total output in terms of the traded good (OA in Fig. 2).

We shall turn to the description of the money markets in the two countries.

Demand for Money

In nominal terms:

$$L=k(P_1X_1+P_2X_2), \qquad (3-7)$$

$$L^*=k^*(P_1^*X_1^*+P_2^*X_2^*),$$

where

L: nominal stock demand for money

k: the Cambridge k.

Assuming that the homogeneity property holds for the equations of (3-7), we may rewrite these as:

$$\bar{L}=\frac{L}{P_1}=k(X_1+qX_2)=k\bar{Y}(q), \qquad (3-7)'$$

$$\bar{L}^*=\frac{L_1^*}{P_1^*}=k^*(X_1^*+q^*X_2^*)=k^*\bar{Y}^*(q^*).$$

Supply of Money

$$\bar{M}=\frac{M}{P_1}, \qquad (3-8)$$

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(15) It is assumed that the demand function for each good in each country is homogeneous of degree zero in P_i (P_i^*) and Z (Z_*), the nominal aggregate expenditures.

$$\bar{M}^* = \frac{M^*}{P_1^*},$$

where M and M* are nominal supply of money. They are assumed to be fixed.

Desired Rate of Hoarding

$$\bar{H} = \pi(\bar{L} - \bar{M}) = \bar{H}(q, \bar{M}), \qquad (3-9)$$

$$\bar{H}^* = \pi^*(\bar{L}^* - \bar{M}^*) = \bar{H}^*(q^*, \bar{M}^*),$$

where π is the speed of adjustment.

Since the existence of bonds, and other stock of assets such as land and physical capital was assumed away at the beginning, the residents of both home and foreign country have only three choices about the disposal of their current income. They can spend it either on the traded good or on the non-traded good, or they can hoard.

Budget Constraint

$$q(X_2 - C_2) + (X_1 - C_1) = \bar{H}, \qquad (3-10)$$

$$q^*(X_2^* - C_2^*) + (X_1^* - C_1^*) = \bar{H}^*.$$

These equations are obtained simply by rewriting (3-5). If the non-traded good market clears, $(X_2 = C_2)$, the excess supply of traded goods is equal to the desired flow demand of money.

Now, let us see the equilibrium conditions.

Short-Run Equilibrium

$$E_i(q, \bar{Z}) + E_i^*(q^*, \bar{Z}^*) = 0, \quad i = 1, 2, \qquad (3-11)$$

$$\bar{H}(q, \bar{M}) + \bar{H}^*(q^*, \bar{M}^*) = 0,$$

where

$$E_i(q, \bar{Z}) \equiv X_i(q) - C_i(q, \bar{Z}), \quad i = 1, 2$$

$$E_i^*(q^*, \bar{Z}^*) \equiv X_i^*(q^*) - C_i^*(q^*, \bar{Z}^*).$$

E_i and E_i^* refer to the excess supply of i-th good.

Invoking Walras' Law and dropping the traded good market, we obtain

$$E_2(q,\bar{Z})+E_2^*(q^*,\ \bar{Z}^*)=0\ , \qquad (3\text{-}12)$$
$$\bar{H}(q,\ \bar{M})+\bar{H}^*(q^*,\ \bar{M}^*)=0\ .$$

It is important to emphasize that the non-traded good market in each country must clear separately because there is no common market for the non-traded good. Therefore, we require that $E_2(q,\ \bar{Z})=0$ and $E_2^*(q^*,\ \bar{Z}^*)=0$.

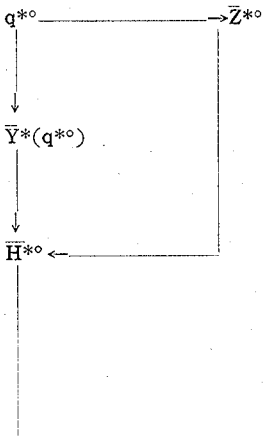
To get an idea how this hypothetical world attains a momentary flow equilibrium, we will experiment with the model. Of course, the system (3-12) is a general equilibrium system in which a unidirectional causation is impossible. However, for the sake of expositional convenience, let us start with the non-traded good market in each country.

Home Country

In equilibrium, the equation,
$X_2(q)-C_2(q,\bar{Z})=0\ ,$
must hold.
By choosing an arbitrary value of q, say q°, we can solve the above equation for $\bar{Z}$, and obtain $\bar{Z}^\circ$.
As soon as q° is known, the producers determine $\bar{Y}(q^\circ)$.
From expenditure functions of (3-5), $\bar{Z}^\circ=\bar{Y}^\circ-\bar{H}$, we know $\bar{H}^\circ$. This is the current hoarding in real terms that is consistent with "given" aggregate expenditures which is required to equilibrate the non-traded good market under "given" real income.
Due to the budget constraint, $\bar{H}^\circ$,

Foreign Country

$X_2^*(q^*)-C_2^*(q^*,\ \bar{Z}^*)=0$



whether it is positive or negative, hoarding must equal the excess supply or the excess demand for the traded good in home country.

$$\bar{H}^{\circ} \equiv [X_1(q^{\circ}) - C_1(q^{\circ}, \bar{Z}^{\circ})] \gtrless 0 \qquad \bar{H}^{*\circ} \equiv [X_1^*(q^{*\circ}) - C_1^*(q^{*\circ}, \bar{Z}^{*\circ})] \gtrless 0$$

The traded-good market must satisfy this condition:

$$[X_1(q^{\circ}) - C_1(q^{\circ}, Z^{\circ})] + [X_1^*(q^{*\circ}) - C_1^*(q^{*\circ}, \bar{Z}^{*\circ})] = 0 .$$

In the single world market for the traded good, the money price, P_1, is freely adjusted so that an excess supply in one country may exactly be offset by an excess demand in the other country, and vice versa. Since the commodity arbitrage is assumed to work perfectly, P_1 determines automatically $e \cdot P_1^*$ under the fixed exchange rate system. As soon as we know the market solution for P_1 and $e \cdot P_1^*$, say P_1° and $e \cdot P_1^{*\circ}$, respectively, we can find the absolute price of the non-traded good in each country because we know q° and $q^{*\circ}$. Thus, we have

$$q^{\circ} = \frac{P_2}{P_1^{\circ}} \rightarrow P_2^{\circ} = q^{\circ} P_1^{\circ}, \text{ and}$$

$$q^{*\circ} = \frac{P_2^*}{P_1^{*\circ}} \rightarrow P_2^{*\circ} = q^{*\circ} \cdot P_1^{\circ}/e$$

making use of $P_1^{*\circ} = P_1^{\circ}/e$.

The nominal quantity of money which was assumed to be given exogenously and the equilibrium money price of the traded good together are sufficient to determine the real quantity of money supply:

$$\bar{M}^{\circ} = \frac{M}{P_1^{\circ}} \text{ and } \bar{M}^{*\circ} = \frac{e \cdot M^*}{P_1^{\circ}} .$$

These values of $\bar{M}^{\circ}$ aud $\bar{M}^{*\circ}$ are fed back into the equations in (3-9).

The processes described above are the channels through which the short-ruu equilibrium is attained. However, this equilibrium solution is truly shortlived. Although the two markets for the good are in equilibrium, the money market is not in stock equilibrium in the short-run. The balance-of-payments, ($\overline{H}$ and $\overline{H}^*$), which is the only way to redistribute the predetermined world nominal quantity of money between these two countries, gives rise to disturbances through changes in the actual stock of money.[16] These changes, in turn, affect the desired rate of hoarding in each country by equations in (3-9). When the desired rate of hoarding changes, it influences the desired flow of expenditures and, as a consequence, q must change. Any change in q triggers a chain of reactions in the whole system. Thus, the economy undergoes the second-run, third-run and an infinite-run of the adjustment processes. The system can never cease until it reaches the long-run equilibrium nirvana which is realized only when these conditions hold: $\overline{H}=0$ and $\overline{H}^*=0$.

Formally, the long-run stationary state is represented by thesee equations:

$$E_2(q,\ \overline{Z})=0 \qquad (3\text{-}13)$$
$$E_2^*(q^*,\ \overline{Z}^*)=0$$
$$\overline{H}(q,\ \overline{M})=-\overline{H}^*(q^*,\ \overline{M}^*)=0\ .$$

Here again, we see that the Two Good-Tow Money-Two Country world can achieve the long-run equilibrium *automatically* and that any deficits

(16) "A terse, but fairly complete." analysis of the monetary redistribution is found in:
Arnold Collery, *International Adjustment, Open Economies, and the Quantity Theory of Money*, Princeton Studies in International Finance, No. 28, June 1971.

in the balance-of-payments of either country can be eliminated *automatically*. A balance-of-payments disequilibrium is merely a transient phenomenon.

So far as we admit the assumptions of this model, there is no escape from this conclusion of automaticity. The effectiveness of the balance-of-payments adjustment depends on the sizes of π and π^* of the equations of (3-9). The key assumption is the wage-price flexibility.

Professor Dornbusch recognizes the limitations of this model and states:[17]

> There are two main shortcomings. The first relates to the costless adjustment in commodity and factor markets that allows instantaneous movements along the transformation curve and thus disregards both the specificity of factors and the existence of contracts fixed in nominal terms .... The second limitation arises from the absence of assets alternative to money. The implication of that restriction is that too much weight of the analysis rests on the effect of a change in real balances on expenditure.

Granted the two conditions, i.e., the wage-price flexibility and the remarkable effectiveness of the Walrasian "tâtonnement" process, the existence of the non-traded good does not present any difficulty to the automatic adjustment of the balance-of-payments. These two conditions, however, are dubious as a realistic description of the world. Besides, the internal balance—the domestic price stability—has been dictated by the need for the external balance.

Be that as it may, we shall examine one more extension of the model into the many assets case in the next section.

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(17) Rudiger Dornbusch, "Currency Depreciation, Hoarding and Relative Prices," *Journal of Political Economy*, (July-August, 1973), p. 915.

Two Good-Many Assets Model

As soon as assets other than money are introduced into the model, the portfolio balance among the diversified assets must be considered. There have been several articles in which an attempt has been made in this direction.[18] Since all of the literature cited below reverts to the "small country" assumption, we will review these relatively new contributions. We shall be concerned with bringing out the basic structure underlying the recent works. We are interested in this question: does the automatic adjustment mechanism for the balance-of-payments work even when portfolio diverification has been brought into the picture?

Along with Professor Boyer, let us state the major assumptions of the model.

Assumptions:

1. Home country is "small" and the terms of trade is exogenously fixed.
2. There are two goods: a composite good called "the traded good" and the non-traded good.

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(18) Pentti J. K. Kouri and Michael G. Porter, "International Capital Flows and Portfolio Equilibrium," *Journal of Political Economy*, (May/June 1974), pp. 443—467.
Jacob A. Frenkel and Carlos A. Rodriguez, "Portfolio Equilibrium and the Balance of Payments: A Monetary Approach," *American Economic Review*, (September 1975), pp. 674-688.
Rudiger Dornbusch, "A Portfolio Balance Model of the Open Economy," *Journal of Monetary Economics*(January 1975), pp. 3—20.
Robert Flood, "Growth, Prices and the Balance of Payments," *Canadian Journal of Economics*, (May 1977), pp. 218—232.
Russel S. Boyer, "Commercial Policy under Alternative Exchange Rate Regimes," *Canadian Journal of Economics*, (May 1977), pp. 218—232.
_____, "Devaluation and Portfolio Balance," *American Economic Review*, (March 1977), pp. 54—63.

3. Prices and wages are perfectly flexible.
4. There are two financial assets: money and bonds.
5. The bonds are denominated either in home currency or in foreign currency, and bonds are internationlly tradable.
6. The rate of interest is exogenously fixed.
7. New issues of domestic bonds during the period considered here are ruled out.
8. Net investment in physical capital is zero.
9. Resources, taste and technology are fixed.
10. Price expectations are static.

We shall use the following notation:(19)

q : the relative price of the non-traded good in terms of the traded good

P_1: the home currency price of the traded good

P_2: the home currency price of the non-traded good

P : a geometrically weighted price index

α : the weight for the above index; the proportion of the output of the non-traded good to the total output of home country

e : the home currency price of a unit of foreign currency (exchange rate)

W: the nominal value of wealth in home currency

w : the real value of wealth

B_d: the home currency value of bonds denominated in that currency

B_f: the value in foreign currency of bonds denominated in

(19) To keep consistency with the previous section, our notation is somewhat different from that of Boyer.

that currency

B_a: the aggregate domestic currency value of bonds

M: the nominal supply of home currency

C: the current account surplus measured in foreign currency (i.e., sum of the trade and debt service balance)

K: sum of the capital account surplus and the gains in international reserves, both measured in foreign currency

$\bar{w}$: the target level of real wealth, which is an exogenons variable in the model

π: the speed of adjustment

E_i: the excess demand for i-th good, i=1, 2 i=1, the traded good; i=2, the nontraded good.

With the notation spelled out, we are in a position to describe the model.

As in the case of section 3, the production of the two commodities in home country is completely specified by q alone. (See Fig. 2, p. 63) The demand for each commodity is a function of the relative price and the level of real wealth, q and w respectively. Since the rate of interest is exogenously determined and assumed to stay constant, it is not included in the arguments of the demand function for real balances. Consequently, the demand for real balances depends only on the level of real wealth, w.

For the equilibrium of the model, we have to consider three flow markets and two stock markets.

Short-Run Equilibrium:

flow markets

$$\begin{cases} \text{non-traded good:} & E_2(q,w)=0 & (4-1) \\ \text{traded good:} & E_1(q,\ w)+C=0 & (4-2) \\ \text{asset accumulation:} & \pi(\bar{w}-w)+\dfrac{eK}{P}=0 & (4-3) \end{cases}$$

stock markets

$$\begin{cases} \text{money:} & P\cdot\ell(w)-M=0 & (4-4) \\ \text{bonds:} & P\cdot b(w)-B_a=0\,, & (4-5) \end{cases}$$

where $\ell(w)$ and $b(w)$ are the demand functions for real balances and real qnantity of bonds.

In addition to these market equilibrium conditions, we have four identities:

$$q=\frac{P_2}{P_1}=\frac{P_2}{e} \qquad (4-6)$$

$$P=P_2^{\alpha}P_1^{1-\alpha}=P_2^{\alpha}e^{1-\alpha}, \qquad (4-7)$$

$$0<\alpha<1$$

$$W=M+B_a=M+B_d+B_f \qquad (4-8)$$

$$w=\frac{W}{P} \qquad (4-9)$$

Since we assume that perfect commodity arbitrage holds for the traded good, the arbitrage equation, $P_1=e\cdot P_1^*$ must hold. P_1^* is the world-market price of the good and is assumed to be unity.

We will discuss the two stock markets first.

K in this model is defined sufficiently broadly to include all transactions that are not listed in the current account. Put in other words, K includes both capital account and international reserve account so that (C+K) exhausts all the international transactions for any period. Therefore, by the principle of double-entry bookkeeping, we have the

identity, $C+K\equiv 0$.

We may note that bonds, irrespective of their denomination, are almost perfect substitutes for money, for the residents of the "small" country can convert any kind of bonds, domestic or foreign denomination, in any quantity into foreign currency at any moment in the "large" rest of the world. Under the assumed fixed exchange rate system of this model, the foreign currency also can be convertible freely into the home currency. If that is so, why should the residents of home country have a separate demand for money and for bonds? We can think of two reasons: the first is that bonds bear the fixed interest rate while money does not; the second is that money is supposed to be the only means of transactions that has so-called convenience yield while bonds do not. These facts in addition to the transaction costs may justify our separate specification of the demand for money function and the demand for bonds function.

The equation (4-1) is nothing but the market clearing condition for the non-traded good. The equation (4-2) states that the excess demand for (supply of) the traded good in home country is equal to the equilibrium current account deficit (surplus) for that country.[20]

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(20) Define X_i as the supply and D_i as the demand for i-th good in physical units by the residents of home country. The full-employment GNP in terms of home currency, Y_{FE} is given by:

$$Y_{FE}=P_1X_1+P_2X_2.$$

The current expenditures on the two goods by the people of home country is defined as:

$$A=P_1D_1+P_2D_2,$$

where A may be referred to as "absorption." From the concepts of national income accounting, the following equation must hold:

$$Y_{FE}-A=P_1(X_1-D_1)+P_2(X_2-D_2)=e\cdot C,$$

where e is the exchange rate and C, the current account surplus in foreign currency. If the nontraded good market clears, i. e., $(X_2=D_2)$, we have

$$P_1(X_1-D_1)=e\cdot C.$$

Concerning equation (4-3), we shall consider the case where home country shows a positive accumulation of wealth, i. e., $\pi(\bar{w}-w)>0$. If home country is to have a positive current saving (accumulation), her current income must be greater than her current expenditures (absorption). This fact, in turn, implies that the current account of her balance-of-payments must be in surplus. Under a fixed exchange rate regime, a current account surplus implies an inflow of foreign currency into the surplus country. If the residents of home country want to trade a part or all of the inflow of foreign currency for foreign bonds, they are free to do so within the limit of the current account surplus. As already mentioned, the sum of foreign currency inflow (the gains in international reserves) and net inflow of foreign bonds has been defined as K. Thus, equation (4-3) implies that the fresh saving in real terms in this period can only take the form of accumulation of foreign assets ($-e \cdot K/P$) in real terms. Furthermore, equation (4-3) stipulates that the residents of home country desire to save a constant proportion of the difference between their target level of wealth and actual wealth. We assume that the residents of home country always realize their desired saving. That is, ex-ante saving is equal to ex-post saving. Given the size of the current saving, the residents of home country decide, paying due consideration to convenience yield, the rate of interest and perhaps risks, how much real balances they should add to present holdings. Their decision on bond holding is just the other side of the same coin. There is no room for an independent decision for bond holding. Whatever is left over constitutes the demand for bonds.

Since $P_1=e$ by our assumption, the excess supply of the traded good is equal to the current account surplus.

With respect to the supply side, the total supply of bonds in home country can be adjusted instantaneously because the rest of the world serves as a big reservoir from which bonds can be taken out at a constant cost at any moment. Moreover, the nominal supply of home currency can be increased automatically from the foreign source. In short, the equilibrium in the two asset markets in home country is demand determined. The portfolio balance in home country is achieved without any difficulty thanks to the "small" country assumption. The desired proportion of real balances to the total real wealth can be achieved without friction.

What about the equilibrium in the flow markets? We should turn to the equations (4-1), (4-2) and (4-3), one of which is redundant due to the budget constraint. Let us suppose that the non-traded good market clears at some arbitrary value of real wealth, $w=w^0$. We may think that w^0 is the predetermined value of real wealth at the beginning of the period. Then, equation (4-1) can be solved for q yielding $q=q^0$. Next, the definition (4-6) gives $P_2^0=e\cdot q^0$, where e is the fixed exchange rate. Since both P_2^0 and $P_1^0\cdot e$ are already known, it is easy to calculate the general price level for home country, according to the formula of (4-7). In addition, α and $(1-\alpha)$ can be determined, as soon as q^0 is known, from the production function whose only argument is q. Therefore, we can compute the value of the general price level by combining this information. Given q^0 and w^0 in this way, equation (4-2) determines the equilibrium value of the current account surplus or deficit depending on the state of the equilibrium—C^0. Because of the identity, $C+K\equiv 0$, we find that $C^0=-K^0$. Finally, equation (4-3) determines the current saving which must be consistent with the equilibrium in the two good markets. That is,

$$\pi(\bar{w}-w^{\circ})=e\cdot C^{\circ}/P^{\circ}.$$

This is the current saving that can be allocated to real balances and bond holding.

The increment in real wealth echoes back to the initially postulated value of w°. Then, the whole system is set in motion again, and again—until it reaches the long-run equilibrium, where $\bar{w}=w$ and $C=K=0$.

Thus, the balance-of-payments for the "small" country is to be automatically achieved without any aid by the economic policy authorities.[21]

What is the significance of policy discussions—devaluation, tariff, and border tax—when we know that the model has a built-in adjustment mechanism for the balance-of-payments equilibrium?

Some Criticisms

The monetary approach to the balance-of-payments shares certain common shortcomings. To quote Professor Whitman:[22]

> Finally, and most important, by focusing on the long-run general-equilibrium characteristics of the economic system—in particular, by assuming that real output is determined exogenously and that money is neutral vis-à-vis real variables—global monetarism consigns

(21) For rigorous treatment of the same model, see Richard K. Anderson and Akira Takayama, "Devaluation, the Specie Flow Mechanism and the Steady State," *Review of Economic Studies*, Vol. XLV (2), No. 137 (June 1977), pp. 347—361.

(22) Marina V. N. Whitman, "Global Monetarism and the Monetary Approach to the Balance of Payments," *Brookings Papers on Economic Activity*, Vol. 3, 1975, p. 536.

> to irrelevance the problems of economic stabilization with which most policy makers are primarily concerned and to ineffectiveness the traditional macroeconomic tools of monetary and fiscal policy. ... They [short-run and medium-run problems] are important, even more fundamentally, because in the real world, long-run equilibrium is a state perhaps approached but never reached, and in a dynamic rather than a stationary economy, the characteristics of the adjustment path, while the economy is out of equilibrium, are bound to affect the characteristics of the long-run itself.

We have already expressed, in the previous sections, our critical attitude toward dubiousness of the wage-price flexibility assumption and the deduced long-run automaticity of the adjustment process.

Technical difficulties apart, Professor Hahn also points out the economic difficulties that the monetary approach to the balance-of-payments suffers as follows:[23]

> Firstly, the money wage flexibility—in both directions and instantaneously—which is postulated has no merit. Nor can one, as Johnson so often does, appeal to 'the long run' when one is examining a dynamic process of the kind proposed. Secondly, the absence of a modelling of the demand for physical assets which have been produced in the past, or physical assets such as land, or financial assets like shares and bonds is serious. It just is not true that a shortfall of intended expenditure over income is necessarily equal to intended hoarding. It may reflect a desire to acquire land, buildings, shares or bonds.... Thirdly, while it is true that in long run equilibrium all sorts of ratios are constant, it is surely highly implausible to suppose that in the short run the ratio of desired real balances to real income is a constant.

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(23) Frank H. Hahn, "The Monetary Approach to the Balance of Payments," *Journal of International Economics*, 7 (1977), pp. 231—249. The above quotation is from pages 237—238.

With respect to the second point mentioned above, we may examine the case where more than one asset exists. Recall the simple Keynesian macroeconomics:

$$Y=C+I+G+Ex-Im,$$

where Y : Gross national product

C : Consumption expenditures

I : Investment expenditures

G : Government expenditures

Ex: Export-value in domestic currency

Im: Import-value in domestic currency.

Re-labeling $C+I+G=A$ and $Ex-Im=B$, and rearranging the terms we get

$$Eg=A-Y+B, \text{ or } A-Y=Eg-B \qquad (5-1)$$

where Eg is the value of excess demand for goods and services. Next, we consider the budget constraint facing this country when there are government bonds as well as money. It should be written as:

$$Y+M^s+B^s=A+M^d+B^d,$$

where Y: current income (or GNP)

M^s: money supply at the beginning of the period

B^s: value of government bonds outstanding at the beginning of the period

A: current expenditures (absorption)

M^d: money demanded at the end of the period

B^d: value of government bonds demanded at the end of the period.

Rearranging the terms, we have

$$A-Y=(M^s-M^d)+(B^s-B^d)$$

$$A-Y=-E_m-E_b \qquad (5-2)$$

where E_m and E_b are excess demand for money and bonds respectively. Combining (5-1) and (5-2), we obtain

$$Eg-B=-E_m-E_b \quad \text{or} \quad B=Eg+E_m+E_b.$$

This implies that the current account surplus is the sum of the excess demand for goods and services, the excess demand for money, and the excess demand for government bonds.

Consider the case where $Eg=E_m=0$, and $B>0$ and $E_b>0$. This result may be interpreted that the inflow of foreign money caused by the current account surplus is exactly offset by the purchase of the government bonds by the residents of this country. On the contrary, if $B<0$ and $E_b<0$, this may mean that the effect of an outflow of domestic money caused by the current account deficit has been cancelled out by the inflow of foreign money due to government bonds sales to foreigners. In effect, the domestic money market equilibrium can remain undisturbed in either case.

The balance-of-payment equilibrium is attained through the bonds market, not through money market. Allowing bonds to exist side by side of money, we have shown that "a shortfall of intended expenditure over inceme is *not* necessarily equal to intended hoarding." This fact cuts off the one-to-one correspondence between the excess-demand for money and the change in international reserves.

The model builders of the monetary approach are apt to play down the roles of government and business firms. The government disappears from the discussion as soon as it fixes the nominal quantity of money. Business firms are treated as if they were phantom-like creatures which conld organize or disband, at will, the productive resources at the "auctionneer's" signals for facor prices. Seeking an optimal combination of various productive resources, firms are supposed to switch

freely from traded to non-traded goods industries or the other way round. The only meaningful decision-making units in the models seem to be the consumers who conceive of the discrepancy between the target and the actual wealth and act promptly so as to fill this gap.

In the real world, however, what the government and bnsiness firms decide for the protection of infant industries, the development of new commodities and overseas direct investment must have a profound influence on a conntry's balance-of-payments. These dynamic considerations have been completely neglected in the monetarist models of the balance-of-payments.

Nevertheless, Professor Harry G. Johnson asserts:[24]

> The central point relevant to this chapter, however, is that if a country is subject to a chronic condition of balance-of-payments deficits as a result of such a constellation of causal factors, it can not hope to remedy the problem except transitorily by application of any of the conventional balance-of-payments policies: deflation of the money supply or of aggregate demand by fiscal policy, devaluation, import restriction or export subsidisation (or in exceptional circumstances export taxation). Even if these policies create a temporary balance-of-payments surplus—and the foregoing analysis indicates that it is not certain that they will, the strongest candidate being import taxation—the only possible long-run remedy within the control of the national policy-making authorities is reduction of domestic credit expansion.

This conclusion depends, however, heavily on the particular models that are characterized by the "classical" or "neo-classical" assumptions. The advocates of the monetary approach to the balance-of-payments

(24) Harry G. Johnson, "The Monerary Theory of Balance-of-Payments Policies," Frenkel and Johnson eds., *op. cit.*, p. 238.

have been claiming too much generality for the simplistic models.[25]

Downward wage rigidity and non-malleability of physical capital are the well known facts of life. Let us see, in passing, what policy is needed for a country with a traded good and a non-traded good sector when she is suffering from external deficits, although internally balanced. The external deficit means that the country is "absorbing" more than it produces. The expenditures must be reduced to cure the external deficit by usual macroeconmic policy—fiscal or monetary. The postulated deficit means also that the money supply in this country is dwindling unless the decrease is offset by the monetary authorities. If the money supply really decreases, the expenditures will be reduced through the real balances effect. Together with the policy-induced expenditure reduction, this real-balance-effect leads to a reduction in the domestic demand for non-traded good. If wages and prices were truly flexible as in the models of the monetary approach the excess supply in the non-traded good sector conld be eliminated throngh price adjustment without difficulty. Under the assumed wage rigidity, however, unemployment of labor and other resources is unfortunately inevitable. If the government's first priority in the economic policy is full-employment, some measures must be taken. The appropriate measure is a switching policy—import quota, tariff, or devaluation—which produces a switching of consumption from the

(25) For detailed criticism, see D. A. Currie, "Some Criticisms of the Monetary Analysis of Balance of Payments Correction," *Economic Journal*, Vol. 86, (September 1976), pp. 508—522.
Gottfried Haberler, The book review on Jacob A. Frenkel and Harry G. Johnson eds., *The Monetary Approach to the Balance of Payments*, 1976, *Journal of Economic Literature*, Vol. 14, No. 4(December 1976), pp. 1324—1328.

(foreign) traded good to the domestic non-traded good through changes in the relative price between these two categories of goods. Any policy listed above raises the domestic price of the traded good relative to the price of non-traded good. This may induce producers to switch from non-traded to traded goods which have become more lucrative. On the other hand, the consumers begin to substitute non-traded goods for relatively expensive traded goods. These shifts in supply and demand will eventually alleviate unemployment. It is well established that two policy means are necessary to attain two policy targets.[26]

If the government has three policy objectives, for example, high employment, reasonable price stability and the balance-of-payments equilibrium, the economic logic requires three policy variables—perhaps fiscal, monetary and exchange rate policy. The monetary policy cannot serve two masters at the same time.

(26) J. E. Meade, *The Balance of Payments*, Oxford University Press, 1951.