Money, Bond and Balance of Payments[1]

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Now a day, we have the traditional theory of devaluation, that is, called the elasticities approach that was developed in the 1930s. This approach was developed by many economists' Robinson, J. [1], Bickerdike, C.F. [2], Alexander, S.S. [3], Jones, R.W. [4], and others. A question of this approach follows; Would devaluation be effective in improving the devaluating country's trade balance? That is to say, what are the conditions on improvement for the devaluating country's trade balance, we were to required those solutions for above questions.

Second approach is designated to the sophisticated Keynesian approach,[2] that is, elasticities-cum-multiplier; in other words, one is named to marriage with elasticities and income approaches. This approach is represented by Hirshman, A.O. [5], Harberger, A.C. [6], Savosnick, K.K. [8], Jones, R.W. [9], and others. This subjects of ap-

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2) cif. Johnson, H. G. [20].

proach is what are the implications of devaluation for the level of domestic output and employment.[3] While the absorption approach of Alexander, S.S. [3] was an attempt to secure with relative to aggregate income and expenditure in one economy. Balance of payments, therefore, identifies to subtract aggregate expenditure from aggregate income. This was to found for a condition in improving balance of payments by devaluation.

Last approach is the monetary approach developed warmly in modern decade. Johnson, H.G. points out that the monetary approach stresses the following three points.[4]

1) Balance of payments problems are monetary problems in a monetary world economic system, and should be analyzed by models that explicitly specify monetary behaviour and integrate it with the real economy.

2) Money is a stock, not a flow, and monetary equilibrium and disequilibrium require analysis of stock equilibrium conditions and stock adjustment processes.

3) Though the distinction is not always necessary or convenient for abstract theorizing, it is essential for balance of payments analysis in fixed-rate system to recognize that, although money can be obtained from two alternative sources – the expansion of domestic credit, and the exchange of goods or assets for international money and conversion of international into domestic money via the monetary anthority – only the second affects the balance of payments.

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3) Anthers have respect to this approach as follows; Johnson, H.G.; Towards a General Theory of the Balance of Payments, reprinted in R.I.E. 1969, and Machlup, R.; Relative Prices and Aggregate Spending in the Analysis of Devaluation, A.E.R. 45. 1955.

4) op. cit. Johnson, H.G. [20]

We will be considered those three approach, however, last approach of those three yets now is not completed for the theoretical analysis. Therefore, I might be implicit arguments for monetary approach, but, next I should be discussed with an intergrated model on the effect in improving balance of payments for the devaluation. Moreover, I would argue about the effects of assets to the balance of payments. Last, Japanese currency yen will be continue for the appreciation since summer time in last year. There is cause for the surplus of balance of payments in my country. If this is true, we must be considered to take away its surplus. Then, we would be given to a consideration for clearing out of the surplus of balance of payments.

[1] The Elasticities Approach

The elasticities approach is a means by using to price elasticities for exports and imports, and this approach regards as only the functions of export and import prices. Then, the basic equations of this approach[5] is,

$$M_2\left(\frac{Px}{\pi}\right) = X_1\,(Px) \tag{1}$$

$$M_1\,(\pi Px') = X_2\,(Px') \tag{2}$$

$$B_1 = \frac{Px}{\pi} M_2\left(\frac{Px}{\pi}\right) - Px' \cdot X_2\,(Px') \tag{3}$$

where Xi is phisical quantity of export goods for the ith country, Mi = phisical quantity of import goods for the ith country, subscript i = home country and foreign country, I and II, respectively,

5) cif. M.Koyama; The Theory of International Economics, Chikura-Shobō, 1964; and S. Morii; International Riquidity and the Stability of Foreign Exchange Market, Sugiyama-Shoten, 1976.

Px or Px′ = export price by the currency of countries, I or II, respectively, and π = the currency units of country II in terms of per unit currency for country I.

Equations (1) and (2) indicate the equlibrium of demand for and supply of export and import in both countries, and equation (3) sets forth an equality of balance of payments in country I, where B_1 is balance of payments in country I.

Differentiating equations (1) through (3), substituting the demand and supply elasticities for import and export in both countries, ηi and ei, respectively, assuming trade initially balanced, and setting initially $\pi = Px = Px' = 1$, we could be obtained,

$$\frac{1}{X_1}\frac{dB_1}{d\pi} = \frac{\eta_1\eta_2(e_2 + e_1 + 1) + e_1e_2(\eta_2 + \eta_1 - 1)}{(\eta_2 + e_1)(\eta_1 + e_2)} \tag{4}$$

Equation (4) is used to know as L. Metzler equation of the stable conditions on foreign exchange market. If foreign exchange market is stable, right side of equation (4) must be positive. From equation (4) it follows,

$$\text{If } e_2 = e_1 = \infty, \quad \text{then } \eta_2 + \eta_1 - 1 > 0 \tag{5}$$

This expression is designated as the stabilizing condition of Marshall = Lerner.

The Marshallian elasticity analysis of devaluation is subject to a number of critisisums.[6)]

1) It ignores cross-relations among relative goods prices and demand and supply, however, there must be a third, non-traded good present for exports and imports to have independent prices.

2) From a Keynessian point of view, most versions of the elasticity analysis ignore the net multiplier effects of changes both

6) cif. Johnson, H.G. [20].

in export proceeds and in spending on home and exportable goods associated with changes in import expenditure. It must be assumed that the increase in domestic currency export earnings that necessarily results from devaluation is entirely added to saving, and that variations in either direction in domestic currency expenditure on imports are matched by equal changes in saving.

3) It implicitly assumes both that any improvement in the trade balance following devaluation is matched by saving in the specific form of accumulation of foreign exchange reserves, and that the resulting accumulation of hoards of foreign exchange has no feedback effect on the real economy.

[II] The Sophisticated Keynesian Approach

This approach represented by Harberger, A.C., Jones, R.W., and many others is combined the elasticity with the multiplier. Then, this approach is that the basic equations[7] follow,

$$Y_1 = C_1(Y_1) + \pi B(Y_1, Y_2, \pi) \tag{6}$$

$$Y_2 = C_2(Y_2) - B(Y_1, Y_2, \pi) \tag{7}$$

$$B = B[Y_1(\pi), Y_2(\pi), \pi] \tag{8}$$

where Y is output or national income, C the expenditure for domestic goods, and other notation the same described in the preceding.

Now, differentiating equations (6) through (8), the following determinants is obtained.

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7) cif. S. Morii; Effects of the Devaluation and Domestic Price, Review of Economic Research in Hiroshima Economic College. No. 10, 1974, and op. cit. S. Morii, 1976.

$$\begin{pmatrix} m_1 + S_1 & -m_2 & 0 \\ -m_1 & m_2 + S_2 & 0 \\ m_1 & -m_2 & 1 \end{pmatrix} \begin{pmatrix} \frac{dY_1}{d\pi} \\ \frac{dY_2}{d\pi} \\ \frac{dB}{d\pi} \end{pmatrix} = \begin{pmatrix} X(\eta_1 + \eta_2 - 1) \\ -X(\eta_1 + \eta_2 - 1) \\ X(\eta_1 + \eta_2 - 1) \end{pmatrix} \quad (9)$$

where $\frac{\partial B}{\partial Yi}$ is the marginal propensity to import for the ith country, Mi, in normal case $0<Mi<1$, $(i = 1, 2)$. Note we assume that the marginal propensity to save (or hoard) for the ith country, Si, equals to $1 - Ci$; in normal case $0<Si, Ci<1$; and that the left side of equation (9) be able to get it taking account of equation (5) to (4). We, of cource, assume initially an equilibrium of trade.

Then, solving the effect of devaluation to balance of payments,

$$\frac{dB}{d\pi} = \frac{S_1 S_2 X(\eta_1 + \eta_2 - 1)}{S_1 m_2 + S_2 m_1 + S_1 S_2} \quad (10)$$

This equation is pointed out by Johnson, H.G. as follows;[8] This formula seems to suggest that the more sophisticated Keynesian general equation model is quantitatively similar to the earlier elasticity model, since both seem to depend on the Marshall-Lerner sum-of-the-elasticities-minus-one criterion. This, however, is a potentially dangerous oversimplication. First, the presence of the other symbols, while normally taken all to be positive, shows that fulfilment of the stability criterion produces improvement in the balance only if there exist unemployed resources which can be used to satisfy the excess demand for domestic output which would otherwise drive the exchange rate back up to its initial level. Second, one of the marginal propensities to save could be negative without the equilibrium of the whole world system being unstable.

8) loc. cit. Johnson, H.G. [20]

[3] The Absorption Approach

The absorption approach is to understand such that there is not a relation with the analysis of relative prices for goods but a relation to the aggregate revenue, Y, and aggregate spending, E, for the one country. In normal case, usually, aggregate income and aggregate expenditure in a country must identify as follows.

$$Y \equiv E \tag{11}$$

Then, the basic equation of the absorption approach in a open system contains export, X, and import, M, respectively. Therefore, the equation can be written as,

$$Y \equiv E + B \tag{12}$$

We should be notice that total expenditure saying here equals the expenditure for domestic goods. Therefore, demand of importable goods involves not in aggregate spending. According to this assumption, national income identifies to sum up the absorption, A, and balance of payments.

$$Y \equiv A + B \quad \text{or} \quad Y - A \equiv B \tag{13}$$

Differentiating with the total, the following equation obtains.

$$dB \equiv dY - dA \tag{14}$$

Alexander designates this for the fundamental equation.[9] However, the absorption for goods and services at least depend upon a part of income, and on the factor of devaluation and/or prices.

$$dA = a \cdot dY + b \tag{15}$$

where a is marginal propensity to aburb, moreover a·dY the income effect induced with devaluation, and b the direct effect on absorption

9) op. cit. Alexander, S.S. [3]

by the devaluation. Thus, above the fluctuatating equation can be re-written as follows.

$$dB \equiv (1 - a)\, dY + b \tag{16}$$

According with devaluation, therefore, a has to less than unity in order to improve on balance of payments. If $a \geq 1$, an improvement on the balance of payments normally may not be expects ; that is, when the marginal propensity to absorb is greater than unity, exsisting to less a unity on the marginal propensity to consume, the effects of income, (1−a)dY, is negative, and in the contrary grows to worse on the balance of payments.

[4] The Monetary Approach

Johnson describes the monetary approach to devaluation theory as follows:[10] The monetary approach to balance of payments theory in its simplest formulation suppresses the traditional distinction between exports, imports and non-traded goods. It concentrates on the stock disequilibrium between demand for and supply of money that gives rise to international money flows or alternatively the demand for and supply of its past of the domestic money supply.

Furthermore, the potential excess demands at prices for goods, bonds, and money must obey Walras' Law as imposed by the overall budget constraint, expressed as the sum of the excess demands being identically zero. In a closed economy, excess demands represent as the following equation.

$$D_G + D_S + D_M \equiv 0 \tag{17}$$

where Di indicates excess flow demand for the ith goods and the sub-

10) loc. cit. & cif. Johnson H.G. [20].

scripts i represent goods, G, securities, S, and money, M, respectively. This identity can be rewritten an open system,

$$(X_G - M_G) + (X_S - M_S) + (X_M - M_M) \equiv 0 \qquad (18)$$

where X denotes exports and M imports. Each terms in equation (18) signify the current account, the capital account, and the financial account, respectively. That is, the current account surplus plus the capital account surplus plus the net outflow of international reserves must sum identically to zero.

Walras' Law seems to suggest that the net international money flow can be treated as the residual of the other two flows. Hence the balance of payments, B, should be write as

$$B_t = X_{M,t} - M_{M,t} = g(D_{M,t} - S_{M,t}) \qquad (19)$$

where t is time, X_M and M_M are exports and imports of money in exchange for imports and exports of goods and bonds, D_M and S_M are the stock demand for and stock supply of international money, and g is a general functional form.

[5] The Integrated Model

So far we concentrated on the analysis of different approach to balance of payments. Here we will analyze macroeconomic model in a open system that we are named for the integrated model. Why do we called for the integrated? The reason means to cover with all including approach at the above. Then, we are representative of Kynesian model in a open economy as the following.[11)]

11) cif. Kyle, J.F. [21], and I am summarized the following: S. Morii; Analysis of Macroeconomic Model in a Open System, Review of Economic Research in Hiroshima Economic College, No. 15. 1977.

$$Y = D(y, p, \pi q, i) + X(p/\pi) \tag{20}$$

$$B = PX(p/\pi) - \pi qF(y, p, \pi q, i) \tag{21}$$

$$\frac{m}{\phi} = L(\bar{Y}, i) \tag{22}$$

where y indicates nominal income, q foreign price in terms of foreign currency, i interest rate, F the quantity of hom imports, $M = \frac{m}{\phi}$ real supply of cash balance, ϕ price index, L real demand for cash balance, and $\bar{Y}$ is real income. Equation (22) is the money market, designating to equality with real demand for and supply of cash balances.

Then, differentiating totaly to equations (20) through (22),

$$\begin{pmatrix} 1 - Dy + B(D\pi q - Xp/\pi) & -Di & 0 \\ Fy - \beta(X + Xp/\pi + F\pi q) & Fi-1 & 1 \\ -\{ L\bar{Y} + \beta[\alpha m + (1-a)L\bar{Y}y] \} & -Li & 0 \end{pmatrix} \begin{pmatrix} dY \\ di \\ dB \end{pmatrix}$$

$$= \begin{pmatrix} (D\pi q - Xp/\pi) & 0 \\ -(F + F\pi q + Xp/\pi) & 0 \\ [(1-\alpha)(m - L\bar{Y}y)] & -1 \end{pmatrix} \begin{pmatrix} d\pi \\ \\ dm \end{pmatrix} \tag{23}$$

where $\beta = -\frac{Y_{NN}}{Y^2{}_N}$, therefore $dP = \beta dY$, of course, N is labour, and α indicates a share of the domestic goods in the aggregate absorption, that is, $\alpha \equiv \frac{PD}{A}$. In this place, the determinant in terms of coefficients, $\triangle$, holds

$$\triangle = 1 - Dy + \beta(D\pi q - Xp/\pi) + \{L\bar{Y} + \beta[am + (1-a)L\bar{Y}y]\}\frac{Di}{Li} \tag{24}$$

translating this equation (24),

$$\triangle = 1 - Dy + L\bar{Y}\frac{Di}{Li} - \beta\{Xp/\pi - D\pi q - [\alpha m + (1-\alpha)L\bar{Y}y]\}\frac{Di}{Li} \quad (25)$$

Now, the brace of this equation equals to $\frac{dY^d}{dP}$, that is, the variable rate of the aggregate demand in terms of prices for domestic goods. Moreover, because of $B \gtrless 0$, the determinant $\triangle$ become to greater than zero as far as $\frac{dY^d}{dP} < 0$. Note usually that the determinant is treated of greater than zero céteris paribus.

Then, the effect of employment to devaluation obtains,

$$\frac{dY}{d\pi} = \frac{1}{\triangle}\{D\pi q - Xp/\pi - [m(1-\alpha)(1-\mu)]\frac{Di}{Li}\} \quad (26)$$

where μ is the elasticity of real demand for cash balance, that is,

$$\mu \equiv \frac{\partial L}{\partial Y}\frac{Y}{L} = \frac{\partial m}{\partial Y}\frac{Y}{m}.$$

In equation (26) if we assume to $\mu = 1$, indirect effect on interest rate gives not rise the influence. In this case, when domestic goods become the gross substitution with foreign goods, that is, $D\pi q > 0$, $\frac{dY}{d\pi}$ is positive. If $\mu > 1$, and $D\pi q > 0$, this means to be $\frac{dY}{d\pi}$ greater than zero. That is to say, the domestic residents give raise to decreasing demand for foreign goods, that is, demand for import goods in the devaluating country; the foreign residents bring about increase the demand for domestic goods; this implies to increase the employment in home country. Furthermore, when $\mu = 1$, and domestic goods is gross substitution with foreign goods, that is, $D\pi q > 0$, then $\frac{dY}{d\pi} \gtrless 0$. In other words, according to whether the effect in the commodity market prefers to or not for the effect in the money market, output or employment upon the devaluation shows to give rise to increase or decrease.

Well, in this world, we intend to investigate the effect of the devaluation to balance of payments. Then, applying Cramer's Law to

equation (23), that is obtainable as follows.

$$\frac{dB}{d\pi} = -\frac{1}{\triangle}\{X(1+\eta_F+\eta_X)\,[\,(1-Dy)+(L\bar{Y}+\beta m)\frac{Di}{Li} + (D\pi q - Xp/\pi)\,[Fy - (L\bar{Y}+\beta m)\frac{Fi}{Li} - [\,(1-\alpha)(m-L\bar{Y}y)\,]\,[\,(1-Dy)\,\frac{Fi}{Li}+Fy\,\frac{Di}{Li}]\} \tag{27}$$

where η_X ($\equiv \frac{\partial X}{\partial P}\frac{P}{X}$) is the price elastisity of supply to exports, and η_F ($\equiv \frac{\partial F}{\partial P}\frac{P}{F}$) is the price elasticity of demand to imports.

Case 1) When the supply curve is infinitely elastic, assuming to be not happened to the effect of interest and the variance of income, that is, assuming to $\beta = 0$ and $Di = Fi = 0$, and taking off Dy and Fy, we make the result in the following.

$$\frac{dB}{d\pi} = -X(1+\eta_F+\eta_X) \tag{28}$$

Then, when we request for the sufficient conditions, we would be approve of applying with the known enough Marshall-Lerner conditions. That is to say, this implies the conditions to be greater than unity summing up the price elasticities of demands to imports in both countries, i.e. $\eta_X + \eta_F > 1$.

Case 2) We suppose to take up Keynsian neutral policy by monetary authority; namely this is of the presumption with continuously changing for nominal money in order to pegged interest rate. In our model, therefore, this assumes to $Di = Fi = 0$ and/or $Li \to \infty$, in addition providing with $\beta = 0$, equation (27) obtains as follows.

$$\frac{dB}{d\pi} = -\,[\,X(1+\eta_F+\eta_X)+(D\pi q - Xp/\pi)\,\frac{Fy}{1-Dy}\,] \tag{29}$$

Then, the conditions to $\frac{dB}{d\pi} > 0$ requires to follow from equation (29),

$$\eta X + \eta F > 1 + (D\pi y - Xp/\pi)\frac{Fy}{1 - Dy} \tag{30}$$

Case 3) When the supply curve manifests the slope of the positive, that is, $\beta > 0$, equation (27) gives rise,

$$\frac{dB}{d\pi} = -\frac{X(1 + \eta F + \eta X)(1 - Dy) + (D\pi q - Dp/\pi)Fy}{1 - Dy + \beta(D\pi q - Xp/\pi)} \tag{31}$$

In this expression, if there are the assumption to the gross substitution for domestic and foreign commodities, namely, providing to $D\pi q > 0$, this involves into the decrease for the effect of balance of payments.

In this stage, let us suppose to be adjust with supply of nominal money in the long run. When the balance of payments is a disequilibrium in this case, it is changing with continuance. If the one is deficit on the balance of payments, the other is surplus on the balance, this means to decrease into or increase in the money supply, respectively. Therefore, an augment of money supply is decreased in the surplus to balance of payments, while a diminution of money supply is increased upon the deficite to balance of payments, and this implies to be the condition with the stability for the balance of payments. Then, owing to the observation upon the effect of balance of payments to changing stock of nominal money, using Cramer's Law to equation (23), we make in the following. (32)

$$\frac{dB}{dm} = -\frac{1}{\triangle}\{[1 - Dy + \beta(D\pi q - Xp/\pi)]\frac{Fi}{Li} + [Fy - \beta(X + Xp/\pi + F\pi q)]\frac{Di}{Li}\}$$

If the expression is assumed to be satisfy with the conditions of Marshall-Lerner, and to hold upon the gross substitution; i.e. $\eta_X + \eta_F + 1 < 0$, and $D\pi q > 0$, one becomes $\frac{dB}{dm} < 0$. Now, when we suppose to increase the price of output in domestic commodity for the policy on the monetary expression, namely $\beta > 0$, to make goods up the gross substitution in both countries, and to hold on Marshall-Lerner con-

ditions, then this signifies to be able to secure seriously the stability over the long run.

[VI] Introduction to Assets

We will examine such a portfolio approach what is called as composed of money and bonds into assets or wealth.[12] In the first, we introduce only money as an assets. In the equilibrium, generally, demand of commodities equals supply for commodities in a world, and excess demand of money stock is equate to balance of payments. Therefore, our model consists of three equations as follows,

$$E_1(P_1, P_2, m) + E_1^*\left(\frac{P_1}{\pi}, \frac{P_2}{\pi}, m^*\right) = 0 \tag{33}$$

$$E_2(P_1, P_2, m) + E_2^*\left(\frac{P_1}{\pi}, \frac{P_2}{\pi}, m^*\right) = 0 \tag{34}$$

$$Em(P_1, P_2, m) - B = 0 \tag{35}$$

where Ei indicates the excess demand of the ith commody (i = 1, 2), Pi the ith price, π the exchange rate, m the money stock, Em the excess demand of money, B the balance of payments, and the asterisk is foreign country. Then, the first two equations imply to hold up equilibrium with demand of and supply for each commodties in the world. In last equation, balance of payments raises about to be equivalent with excess demand of money stock.

Now, in order with solving on those equations we differentiate totally,

$$\begin{pmatrix} E_{11} + E_{11}^* & E_{12} + E_{12}^* & 0 \\ E_{21} + E_{21}^* & E_{22} + E_{22}^* & 0 \\ Em_1 & Em_2 & -1 \end{pmatrix} \begin{pmatrix} dP_1 \\ dP_2 \\ dB \end{pmatrix} \tag{36}$$

12) cif. Kyle, J.F. [21], and S. Morii; Effects to Balance of Trade with Relative Princes, Assets, and Non-Traded Goods, Memorial Issue in a Decade of the Foundation, Economic College of Hiroshima, 1977.

$$= - \begin{pmatrix} mE_1 m & m^*E_1^*m & m^*E_1^*m^* \\ mE_2 m & m^*E_2^*m^* & m^*E_2^*m^* \\ mE_m m & 0 & 0 \end{pmatrix} \begin{pmatrix} \frac{dm}{m} \\ \frac{dm^*}{m^*} \\ \frac{d\pi}{\pi} \end{pmatrix}$$

Then we seem to be able to understand intuitively out of this expression becoming of $\frac{dB}{dm^*/m^*} = \frac{dB}{d\pi/\pi}$. Furthermore, initially taking account of equilibrium with balance of payments, we shall acknowledge to $\frac{dB}{dm/m} = -\frac{dB}{d\pi/\pi}$ in this system.

Up to this, we dealt with the money as assets, however some securities will add to those assets. Then, the desirable stock of bonds take place to setting upon the function of the degree of the commodities prices and wealth. When g designates the desirable stock of bonds and $Pb = \frac{1}{i}$ the prices of bonds, then the function of excess demand of security, Eg, represents as the following expression.[13)]

$$E_g = E_g (P_b, P_1, P_2, W, g) \tag{37}$$

where W designates for the wealth. Then, by the introduction of bonds, we can be rewritten into the function of excess demand of each commodities,

$$E_i - E_i(P_b, P_1, P_2, W) \qquad (i = 1, 2) \tag{38}$$

Therefore, when we suppose to involve with bonds in our system, then our models could be designated as follows.

$$E_i(P_b, P_1, P_2, W) + E_i^*(P_b^*, \frac{P_1}{\pi}, \frac{P_2}{\pi}, W^*) = 0 \qquad (i = 1, 2) \tag{39}$$

$$E_g(P_b, P_1, P_2, W, g) = 0 \tag{40}$$

$$E_g^*(P_b^*, \frac{P_1}{\pi}, \frac{P_2}{\pi}, W^*, g^*) = 0 \tag{41}$$

13) Note that the value of wealth divides into the value of holding stock of securities and the money; that is, W = g + m = Pbg + m.

$$Em(P_b, P_1, P_2, W) - B = 0 \tag{42}$$

Now, let us assume to be hold small country by domestic country. That is to say, this means that domestic country sufferes not to the effect of price variances in other world; in other words, for example, my country cannot be recieved with the effectiveness of the terms of trade; accordingly, those prices being able to deal with such as only one goods for trade, we are obtained a simple model from above system.

$$E_g(P_b, P_1, W, g) = 0 \tag{43}$$

$$B + P_1 E_1 (P_b, P_1, W) = 0 \tag{44}$$

Initially, because of equate all the prices and exchange rate to unity, the balance of payments is in an equilibria. Then, differentiating equations (43) and (44) totally.

$$\begin{pmatrix} E_{gb} + gE_{gw} & 0 & dP_b \\ E_{1b} + gE_{1w} & 1 & dB \end{pmatrix} = - \begin{pmatrix} E_{g_1} & E_{gw} & P_b E_{gw} + E_{gg} \\ E_1 + E_{11} & E_{1w} & P_b E_{1w} \end{pmatrix} \begin{pmatrix} dP_1 \\ dW \\ dg \end{pmatrix} \tag{45}$$

where $E_{gb} \equiv \frac{\partial E_g}{\partial P_b}$, $E_{g_1} \equiv \frac{\partial E_g}{\partial E_1}$, $E_{gi} \equiv \frac{\partial E_g}{\partial i}$, (i=w,g); Note we take into account of differentiating expression to wealth.[14] In this system, taking into consideration initially to be trade equilibrium, we have $E = 0$; and according with the property of homogeneity, it takes out that $E_{g_1} = -[(P_b E_{gw} + E_{gg}) + E_{gw}]$, and $E_{11} = -(P_b E_{1w} + E_{1w})$. Substituting (45) into $G = P_b g$, $E_{gg} = -1$, $P_1 = \pi$, equation (45) can be rewritten over the following.

$$\begin{pmatrix} E_{gb} + gE_{gw} & 0 \\ E_{1b} + gE_{1w} & 1 \end{pmatrix} \begin{pmatrix} dP_b \\ dB \end{pmatrix} \tag{46}$$

14) Taking back to a footnote 12, and differentiating the expression of wealth, we obtain as follows.

$$dW = P_b\, dg + g\, dP_b + dm$$

$$= \begin{pmatrix} -[(GE_{gw} - g) + mE_{gw}] & mE_{gw} & GE_{gw} - g \\ -(GE_{1w} + mE_{1w}) & mE_{1w} & GE_{1w} \end{pmatrix} \begin{pmatrix} \frac{d\pi}{\pi} \\ \frac{dm}{m} \\ \frac{dg}{g} \end{pmatrix}$$

where $\triangle = Egb + gEgw$. If we consider bonds to be general goods such a third commodity as products, then $Egb < 0$; moreover when we suppose to the effect of gross substitution for changing with prices, we could raise to $Eg_1 > 0$, and $Egw > 0$.

In this system when it is variable with money supply, requesting by the effect to balance of payments, we obtain,

$$\frac{dB}{dm/m} = -\frac{1}{\triangle}[(E_{gb} + gE_{gw})\, mE_{1w} - (E_{1b} + gE_{1w})\, mE_{gw}] \quad (47)$$

The sign of equation (47) is negative. Therefore, it means that the increased amount of money supply grows worse for balance of payments; in other words, when the amount of money supply is increase, then this implies to decrease the surplus of balance of payments, furthermore, it manifests that the diminution to the amount of money supply exerts upon the action to be decrease on the deficit to balance of payments.

Next, from equation (46) obtains the effect to balance of payments by changing of foreign exchange,

$$\frac{dB}{d\pi/\pi} = \frac{1}{\triangle}\{m[(E_{gb} + gE_{gw})\, E_{1w} - (E_{1b} + gE_{1w})\, E_{gw}] + G[(E_{gb} + gE_{gw})\, E_{1w} + (E_{1b} + gE_{1w})(1 - E_{gw})]\} \quad (48)$$

Now, when the effect of interest rate gives rise in the output market, that is, $E_1 b = 0$, then the balance of payments lies the improvement

with devaluation. In this case, if $\left|\frac{dB}{d\pi/\pi}\right| > \left|\frac{dB}{dm/m}\right|$, then it involves that the devaluation exerts upon more strong operation than improvements of the deficit to balance of payment owing to the decrease of the amount of money supply. Furthermore, if it has an effect to the interest rate in the output market, though this improves upon the balance of payments, this improvement with devaluation depends upon whether $\left|\frac{dB}{d\pi/\pi}\right| > \left|\frac{dB}{dm/m}\right|$ or $\left|(Egb + gEgw)\, E_1 w\right| < \left|(E_1 b + gE_1 w)(1 - Egw)\right|$.

Last, solving the effect of changing on bonds supply to balance of payments, we obtain out of equation (46) as follows.

$$\frac{dB}{dg/g} = -\frac{1}{\triangle}\{G\,[E_1 w\,(E_{gb} + gE_{gw}) + (E_1 b + gE_1 w)(1 - E_{gw})]\} \quad (49)$$

Then, this is saying to $\frac{dB}{dg/g} < 0$. That is to say, this implies that the argument to the amount of bonds supply gives rise on the effect to be induced with the deficit to balance of payment via the contraction into the money market.

In conclusion, equaton (48) consists of equations (47) and (49); that is, this is $\left|\frac{dB}{d\pi/\pi}\right| = -\left|\frac{dB}{dm/m} + \frac{dB}{dg/g}\right|$. Now, when $\left|\frac{dB}{d\pi/\pi}\right| > \left|\frac{dB}{dm/m} + \frac{dB}{dg/g}\right|$, then this raises about the comprehension that the effect of balance of payments to the devaluation holds by a strong effectiveness rather than the effect of balance of payments with the variation to money supply and bonds supply. Generally, observing intuitively or experimentally, we would talk about more having effect for the balance of payments to devaluation than the effect of money and securities.

[VII] Some Suggestion

Up to this, we concentrated on to be outline untill modern theory out of traditional theory upon the effectiveness of balance of payments with devaluation. Eventually, we known conclusively that the effect

to devaluation is more the stronging than the effect of any other policy. However, we put in mind of the appreciation of yen and the depreciation of dollar since summer 1977. Certainly, we are experimented by the more appreciative or the more depreciative so that is back to be recovery from depression in one economy.

The appreciation of yen is based upon the surplus of the current balances, and oppositelly the deppreciation of dollar depends upon greater deficit in United States. As far as we hold upon the relationship of free trade in our world, anyone would not be able to restrict for the relationship. For example, when we maintain with fixed rate of exchange, then we were not faced with such a problem, because in those day we had been more seriouse restrictions in the provision of International Monetary Fund. In this present, we bring about not the fixed rate but the floating rate of exchange. Moreover, the disturbance term of economy brings about raise by the variation of the floating rate in a every day. However, now a day this fluctuation, of course, cannot be except from foreign market. If it is true, we correspondent with this floating.

Like the present, we suppose to continue with the surplus of balance of payments. Therefore, the surplus in a country causes to appreciate of the currency, for example, yen. If we stay into our hands in order to reserve the received foreign currency, we accept to strong pressure from foreign country. Hence, I propose to take off the excess reserve; One belives that usually the optimum reserve is in a part of import for three month. If it is true to say so, the residual reserve directs to purchasing bonds in foreign countries. Therefore, they might be able to decrease the remaining reserve subtracted from the necessary reserve for importable settlement.

Owing to conducts with such a transaction, it needs to adjust with

the capital market in the economy. Moreover, each countries should not be transact with the purchasing bonds, but must be treat for it with International Monetary Fund. Accordingly, International Monetary Fund is only the place in the transaction of the international securities market, so-called this is the mechanism of the adjustment to balance of payments in the members of participations. However, in order to progress upon the smooth transaction, the participative membership should be granted the strongest power for the transaction upon bonds or securities.

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