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Capital Mobility and Devaluation in a Monetary Approach to the Balance of Payments

Harvey Lapan  
_Iowa State University_

Walter Enders  
_Iowa State University_

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Capital Mobility and Devaluation in a Monetary Approach to the Balance of Payments

Abstract
Judging by recent issues of this, and other Journals, there is still a keen interest in determining the causes of, and cures for, Balance of Trade and Payments disequilibria. The emergence of the Portfolio Balance Approach—” has led to viewing Balance of Trade deficits and surpluses as caused by discrepancies between desired and actual wealth holdings, and Balance of Payments deficits (surpluses) as caused by discrepancies between desired and actual money holdings. Thus, Balance of Trade and Payments deficits and surpluses are viewed as representing disequilibrium within the asset markets. Within this framework several authors have asked what self-correcting tendencies exist and whether a devaluation facilitates any tendency towards self-correction.

Disciplines
Behavioral Economics | Business Administration, Management, and Operations | Finance | Finance and Financial Management | Industrial Organization
Capital Mobility and Devaluation in a Monetary Approach to the Balance of Payments

Harvey Lapan and Walter Enders*

Judging by recent issues of this, and other Journals, there is still a keen interest in determining the causes of, and cures for, Balance of Trade and Payments disequilibria. The emergence of the Portfolio Balance Approach has led to viewing Balance of Trade deficits and surpluses as caused by discrepancies between desired and actual wealth holdings, and Balance of Payments deficits (surpluses) as caused by discrepancies between desired and actual money holdings. Thus, Balance of Trade and Payments deficits and surpluses are viewed as representing disequilibrium within the asset markets. Within this framework several authors have asked what self-correcting tendencies exist and whether a devaluation facilitates any tendency towards self-correction.

Two recent examples of this approach that have appeared in this Journal are a paper by Dornbusch and a paper by Frenkel and Rodriguez. The Dornbusch paper analyzes a two country world in which each country issues a fiat money, while the Frenkel and Rodriguez paper develops a small country, two asset model. In both papers, a devaluation is successful because it reduces real wealth in the devaluing nation and increases real wealth in the appreciating nation. In terms of the Absorption Approach, the devaluation reduces absorption via the cash balance effect.

While both of these papers are important contributions to the examination of the impact of a devaluation on trade balances, they
leave some important questions unanswered. Neither paper addresses itself to the relationship between capital mobility and the effectiveness of a devaluation as both assume that residents of a country only hold assets denominated in terms of their own unit of account. To the extent that residents of a country hold assets denominated in terms of the foreign unit of account, the devaluation will impose capital losses (gains) on residents in the revaluing (devaluing) nation. The magnitude of this wealth transfer depends upon the degree of capital mobility, and it should be noted that the direction of the transfer is opposite to that necessary for a successful devaluation.

Another problem not addressed in these papers is how changes in the terms of trade affect the Balance of Trade. The prevailing view (Tsiang, Harberger, Lawson and Metzler) is that, if a devaluation deteriorates a nation's terms of trade, the efficacy of a devaluation is reduced. A reduction in the terms of trade leads to a decrease in the marginal propensity to save as individuals attempt to maintain their real standard of living. As individuals cannot maintain this standard of living forever, it is still necessary to clarify the impact of terms of trade changes when Balance of Trade disequilibrium is viewed as representing disequilibrium in the asset markets.

The final issue we explore is the impact of non-traded goods on the adjustment process. While Dornbusch addresses this problem, he does not make clear whether a large non-traded good sector expedites or hinders the adjustment process. If we can show a correlation between the size of the non-traded good sector and the efficacy of a devaluation, then inferences can be drawn concerning appropriate policies towards correcting trade disequilibria, and how these policies depend upon the degree of openness of the economy.
We first consider the case of two traded goods in which we examine the terms of trade effects of a devaluation and the effects of residents of a country holding assets denominated in the foreign unit of account. Section II considers the case of non-traded goods and, in contrast to the standard result, demonstrates that a large non-traded good sector reduces the impact of a devaluation. Our conclusions are presented in Section III.

Section I. Devaluation in a Two-Traded Good World

A. The Model

The model we analyze is identical to that of Dornbusch, except we assume 1) there are two traded goods ($X_1, X_2$), and 2) residents of each country may desire to hold assets denominated in terms of the foreign unit of account (one asset is denominated in dollars, the other is pounds). Following Dornbusch, we assume that the U.S. (U.K.) demand for wealth is a constant fraction of U.S. (U.K.) nominal income:

1) \[ \bar{W} = kY = kP_1\bar{Y}; \bar{W}^* = k^*Y^* = k^*P_1^*\bar{Y}^* \]

\( P_i (P_i^*) \) is the dollar (pound) price of good \( i \)
\( Y (Y^*) \) is the dollar (pound) value of U.S. (U.K.) income
\( \bar{Y} (\bar{Y}^*) \) is real income in terms of good 1
\( W (W^*) \) is desired wealth holdings in dollars (pounds)
\( k(k^*) \) is the desired ratio of wealth to income in the U.S. (U.K.)

Assuming the dollar price of pounds is \( e \), commodity arbitrage implies:

2) \[ P_i = eP_i^* \]

Under the assumption that each country produces both goods:

3) \[ Y = P_1Q_1(\rho) + P_2Q_2(\rho); Y^* = P_1^*Q_1^*(\rho) + P_2^*Q_2^*(\rho) \]

\( \bar{Y} = Q_1(\rho) + \rho Q_2(\rho); \bar{Y}^* = Q_1^*(\rho) + \rho Q_2^*(\rho) \)
where: \( p \equiv p_2/p_1 = P^*_2/P^* \) = relative price of good 2. 
\( Q_i(q^*_i) \) = output of good \( i \) by the U.S. (U.K.)
and: production in each country takes place along a concave production possibility frontier on which the output of each good depends only on relative prices.

Desired nominal expenditures (\( E, E^* \)) equal money income minus nominal desired saving (\( S, S^* \)):

4) \( E = P^*_1 Y - S; E^* = P^*_1 Y^* - S^* \)

Following Dornbusch, we assume that desired saving is proportional to any discrepancy between desired and actual wealth:

5) \( S = \pi(kP^*_1 Y - W); S^* = \pi^*[k^*P^*_1 Y^* - W^*] \)

where: \( \pi(\pi^*) \) is the adjustment parameter 
\( W(W^*) \) is actual U.S. (U.K.) dollar (pound) value of wealth

Assuming no net wealth creation by either government, the dollar value of the U.S. Balance of Trade is equal to U.S. wealth accumulation:

6) \( \dot{W} = B = -e\dot{W}^* \)

where: \( B = \) U.S. Balance of Trade

In short-run equilibrium total income must equal total expenditures, a condition which will be fulfilled if desired world saving equals zero. Further, actual wealth accumulation must equal desired saving in each country:

7) \( S + eS^* = 0 \)

8) \( B = S = \dot{W} \)

As equation 7 does not preclude the possibility of an excess demand for one of the commodity's markets and an equivalent excess supply in the other, equilibrium requires:
9) \( Q_2(\rho) + Q_2^*(\rho) = D_2(\rho, E/P_1) + D_2^*(\rho, E^*/P_{1}^*) \)

where \( D_2^* \) is U.S. (U.K.) demand for good 2, which by standard assumptions is homogeneous of degree zero in prices and expenditures.

Given that total world saving equals zero (equation 7) and that equilibrium prevails in the market for good 2, then total world demand for good 1 must necessarily equal the total world supply. Thus, given \( e, W, \) and \( W^* \), equations 7 and 9 determine the equilibrium values of \( P_1 \) and \( \rho \).

Substitute the two relations in 5 into equation 7 in order to solve for \( P_1 \) in terms of \( W, W^*, Y, Y^* \). Substitute this expression into equation 4/8 to yield:

10) \( B = \frac{\pi Y^*(eW^*) - k^*Y^*W}{sY + s^*Y^*} \)

where: \( s = k_\pi \) (\( s^* = k_{\pi}^* \)) is the marginal propensity to save out of income.

As can be seen from equation 10, a U.S. Balance of Trade deficit is a wealth phenomenon, i.e., - the U.S. will experience a trade deficit if the ratio of U.S. desired wealth to actual U.S. wealth is greater than the corresponding ratio for the U.K.

B. The Effects of a Devaluation

From equation 10 it is readily seen that a devaluation of the dollar will alter the U.S. Balance of Trade only insofar as it a) redistributes wealth among countries, or b) alters the ratio of U.S. to U.K. real income (i.e., \( Y/Y^* \)). If, as Dornbusch assumes, no individual holds foreign denominated assets, it immediately follows that the devaluation redistributes wealth away from the devaluing country, thereby improving the Balance of Trade. Since a U.S. devaluation increases the outstanding value of wealth (in terms of the dollar), it will lead to increases in dollar prices.
(decreases in pound prices). The extent to which prices actually rise will depend upon the percent of world wealth denominated in dollars, as well as the propensities to consume out of income and wealth. In any event, the rise (fall) of prices in terms of dollars (pounds), decreases real wealth in the U.S. and increases real cash balances in the U.K. This redistribution of wealth acts to increase U.S. saving, decrease U.K. saving and improve the U.S. balance of trade.

To the extent that residents of a country hold assets denominated in terms of the foreign unit of account, the preceding analysis of a devaluation is faulty. The initial effect of a devaluation of the dollar will cause U.S. residents holding pound denominated assets to experience capital gains while U.K. residents holding dollar denominated assets experience capital losses. Thus, a devaluation of the dollar may redistribute wealth towards the U.S. and away from the U.K. The possibility of a perverse redistribution of wealth means that the degree of capital mobility that exists between the countries will be an important determinate of the efficacy of a devaluation.

The standard assumption of "perfect" capital mobility implies that asset holders are indifferent towards dollar or pound denominated assets. The assumed indifference between the two assets, however, is not sufficient to determine the U.S. (U.K.) holdings of pound (dollar) denominated assets. The assumption we make is that wealth holders (in each country) wish to keep a constant fraction of their total wealth in each asset. Define:

11) $A(eA^*)$ as the outstanding supply, in dollars, of dollar (pound) denominated liabilities of the central government.

Total private wealth, $W^T$, equals $A + eA^*$. Further define:

12) $Z_H(Z_F)$ as the U.S. (U.K.) demand for dollar denominated assets, and
Z*Z* as the U.S. (U.K.) demand for pound denominated assets

By assumption:

13) eZ* = mW; Z* = (1 - m)W
Z* = (1 - m*)W*; Z* = m*(eW*)

NOTE: Z* and Z* are denominated in dollars and Z* and Z* are denominated in pounds.

In (13), m(m*) represents the fraction of wealth held by U.S. (U.K.) citizens in foreign assets. One can plausibly assume that m and m* vary directly with the volume of trade and the degree of capital mobility between the countries. Further, one could define perfect capital mobility (though this differs from conventional definitions) as determined by m = m* = 1/2, for then individuals allocate additional wealth equally among the assets.

From (13), demands for each asset are:

14) Z* + Z* = (1 - m)W + m*(eW*) = A, dollar demand for A assets
Z* = mW + (1 - m*)(eW*) = e(A*)D, dollar demand for (A*) assets.

If A > A ((A*) < A*), there is an excess demand for dollar denominated assets, and central banks will intervene in order to support asset prices, by selling A assets for A* assets. For simplicity, we assume that we are initially in equilibrium in the asset markets.

As previously noted, the crucial impact of the devaluation is through the redistribution of wealth; that is, how does the devaluation alter the dollar (or pound) value of assets held by U.S. (and U.K.) citizens. From (13), the dollar value of U.S. wealth is: W = Z* + eZ* while the dollar value of U.K. wealth is: eW* = Z* + eZ*. Keeping prices, incomes and asset holdings constant:

15) \[ \frac{dW}{de} = Z* + \frac{mW}{e} \quad \frac{d(eW*)}{de} = Z* = (1 - m*)W* \]
From (15), it is seen that the percentage change in dollar wealth of U.S. residents is \( m \), whereas for U.K. residents the percentage change in the dollar value of their wealth is \( 1 - m^* \). Thus, U.S. wealth (in dollars) will fall relative to the dollar value of U.K. wealth only if \( 1 - m - m^* > 0 \). If \( 1 - m - m^* < 0 \), U.S. wealth will increase relative to U.K. wealth and if \( 1 - m - m^* = 0 \), there will be no relative change in wealth. Recalling, from equation 10, that \( B \geq 0 \) as \( \frac{kY}{kY^*} \geq \frac{W}{eW^*} \) (or as \( \frac{kY}{kY^*} \geq \frac{W}{eW^*} \)); a devaluation will redistribute wealth in the wrong direction if \( 1 - m - m^* < 0 \). Thus, if \( 1 - m - m^* \leq 0 \), the devaluation must raise \( Y \) relative to \( Y^* \) if it is to be successful. Notice that \( Y \) and \( Y^* \) are both functions of only one variable (\( \rho \)), so that the devaluation cannot change \( \frac{Y}{Y^*} \) unless the countries have different supply and demand conditions. It should be clear that the impact of a relative price change on the ratio of \( \frac{Y}{Y^*} \) depends upon the pattern of production (i.e., how much of each good a nation produces) and not upon the pattern of trade (i.e., the particular which good a nation exports). The relationships among the devaluation, the trade balance and the terms of trade are formally obtained by totally differentiating equation 10 with respect to \( e \). Utilizing the relationships in 13, simplification yields:

\[
\frac{dB}{de} = \frac{mB}{e} + \frac{\pi^*W^*(sY)(1 - m - m^*)}{(sY + sY^*)} + a_0 \left[ \frac{Q_2}{Y} - \frac{Q^*_2}{Y^*} \right] \frac{d\rho}{de},
\]

where \( a_0 \) is a positive number. From equations 7 and 9:

\[
17) \quad \text{sign} \left[ \frac{d\rho}{de} \right] = \text{sign} [1 - m - m^*][C^*_2 - C_2]
\]

where \( C_2(C^*_2) \) is the U.S. (U.K.) marginal propensity to consume good 2.

Equation 16 demonstrates that the terms of trade has an ambiguous effect on
the trade balance (since \( \frac{Q_2}{Y} - \frac{Q_2^*}{Y^*} \) may be positive or negative) while equation 17 demonstrates that the relative price of good 2 may increase or decrease. The latter follows as: if \( 1 - m - m^* > 0 \) \((1 - m - m^* < 0)\), wealth is redistributed towards the U.K. (U.S.). If the U.K. marginal propensity to consume good 2 is greater than that of the U.S., the relative price of good 2 will rise (fall). In order to explain why the sign of the terms of trade effect is ambiguous consider the case in which \( \frac{dQ}{de} > 0 \).

If the U.S. produces a greater proportion of good 2 as a percent of income than does the U.K. (i.e., \( \frac{Q_2}{Y} - \frac{Q_2^*}{Y^*} > 0 \)), the terms of trade effect acts to improve the U.S. trade balance. This result follows since: when \( \frac{Q_2}{Y} - \frac{Q_2^*}{Y^*} > 0 \), the increase in the relative price of good 2 acts to increase U.S. income relative to U.K. income and so improves the U.S. balance of trade. To the extent that a devaluation redistributes wealth in the right direction, and to the extent that countries tend to produce goods for which they have a high marginal propensity to consume, the terms of trade effect will act to worsen a trade balance. Thus the terms of trade effect is not due to changes in real income (as measured by utility), but instead is due to the savings effects of changes in \( Y/Y^* \). Also notice that the terms of trade effect does not depend upon the pattern of trade (i.e., whether the U.S. imports or exports a particular good) but on the pattern of production.

It can unambiguously be said that the greater the degree of capital mobility, the less effective is the devaluation. In the case of perfect capital mobility \((1 - m - m^* = 0)\), the devaluation has no effect on the trade balance or on relative prices. Dornbusch—in assuming that residents of a country only hold assets denominated in terms of their own unit of account—finds that a devaluation always improves the Balance of Trade.
Setting \( m = m^* = 0 \), we also find that in this special case, the devaluation always works. Lastly, if "enhanced" capital mobility exists \( (1 - m - m^* < 0) \), the devaluation is likely to be counterproductive.10/

The crucial point to note is that when \( m \) and \( m^* \) are greater than zero, the initial gains (losses) of an exchange rate change, act to offset the effects of price increases or decreases on wealth. This result implies that the impact of a devaluation cannot be divorced from the degree of capital mobility. Those factors which induce residents of a country to hold assets denominated in terms of a foreign unit of account—such as a large volume of trade—work against using the exchange rate as a policy instrument.11/ Capital mobility, then, must be considered to be an important factor in determining the boundaries of an Optimum Currency Area: fixed exchange rates should be maintained between areas between which a high degree of capital mobility exists.

Section II. Devaluation and Non-Traded Goods

A. The Model

In this section we investigate the role of non-traded goods in a devaluation. We continue to assume that each country produces two goods. Only one of the goods is a traded good \( (Q_1, Q_1^*) \) as transport costs prevent trade in the second \( (Q_2, Q_2^*) \). The production possibility frontier for each country is assumed concave, so that output of each good depends only on relative prices of these goods. Further, as is customary, demand functions are assumed homogeneous of degree zero in prices and expenditures.

The long-run demand for wealth is as in (1), except we define:

\[ P_1(P_1^*) \] as the dollar (pound) price of the traded good

\[ P_2(P_2^*) \] as the dollar (pound) price of the non-traded good.
Thus, \( Y(Y_t) \) measures income in terms of the traded good. Since only good 1 is traded, commodity arbitrage implies \( P_1 = eP_t^* \), but provides no information on the relation between \( P_2 \) and \( P_t^* \). As in section (I);

18) \( Y = Q_1(\rho) + \rho Q_2(\rho); \ Y_t^* = Q_1^*(\rho^*) + \rho^* Q_2^*(\rho^*) \)

where \( \rho(\rho^*) \) is the relative price of non-traded to traded goods in the U.S. (U.K.).

Given these definitions, the savings-expenditure functions are the same as (4)-(8). However, since the markets for the non-traded goods are independent, two equilibria conditions are needed to replace (9):

19) \( Q_2(\rho) = D_2(\rho, E/P_1); \)

20) \( Q_2^*(\rho^*) = D_2^*(\rho^*, E^*/P^*_1) \)

By Walras' law, if (19), (20), and (7) hold, the traded good market must be in equilibrium.

Finally, the wealth demand functions for each country are given by (13). Given \( W, W^*\), \( e \), equations (7), (19) and (20) determine \( P_1 \), \( \rho \), \( \rho^* \); the Balance of Trade can then be determined from equation 8. Using equation 7 to solve for \( P_1 \) in terms of \( \rho \) and \( \rho^* \), the Balance of Trade in terms of the traded good is:

21) \( B/P_1 = \frac{1}{\tau^*}[k\tau^*eW^* - k\tau^*\tau^*W][\tau^*W + \tau^*eW^*]^{-1} \)

As in Section I, a U.S. trade deficit is caused by an excess supply of wealth in the U.S. relative to the U.K.

B. The Effects of a Devaluation

Intuitively, the impact effect of the devaluation depends upon the ability of the devaluation to redistribute wealth. If \( (1 - m - m^*) > 0 \),
the devaluation redistributes wealth away from the U.S. (the devaluing country). This will lead to a decrease in real expenditures in the U.S. (as measured in terms of the traded good), and therefore to a decline in the relative price of non-traded goods in the U.S. and in U.S. real expenditures; opposite results hold for the U.K. However, if \( m + m^* = 1 \), no redistribution of wealth occurs, and therefore relative prices and real expenditures in each country are unaltered. Finally, if \( m + m^* > 1 \), the devaluation redistributes wealth towards the devaluing country, increasing relative prices and real expenditures in that country, thereby producing perverse results. The critical factor to keep in mind is that the changes in relative prices of non-traded goods are the effect of the devaluation, and therefore the change in these relative prices does not cause the improvement in the Balance of Trade. The determining factor of the impact effect of the devaluation will always be how the devaluation redistributes wealth.

Formally, by totally differentiating (7), (19), and (20) and solving, using definitions (5) and (13), we find:

\[
22) \quad \frac{dP_1}{de_1} = \left[ \frac{Q_2 Q^*_2}{\Delta} \right] \left[ mW(e_2 - \eta_2)(e^*_2 - \eta^*_2 + sC^*_2) + n^*(1 - m^*)(eW^*) \right] \\
\quad (e^*_2 - \eta^*_2)(e_2 - \eta_2 + sC_2)
\]

\[
23) \quad \frac{dP}{de} = - C_2 Q^*_2 mW(eW^*)(e^*_2 - \eta^*_2)(1 - m - m^*)/\Delta P_2
\]

\[
24) \quad \frac{dP^*}{de} = C_2 Q^*_2 mW(eW^*)(e_2 - \eta_2)(1 - m - m^*)/\Delta P^*_2
\]

where:

\( e_2(e^*_2) \) is the price elasticity of supply of good 2; \( e_2 > 0 \)
\( \eta_2 (\eta_2^*) \) is the income compensated price elasticity of demand for good 2; \( \eta_2 < 0 \)

\( c_2 (c_2^*) \) is the marginal propensity to consume good 2; \( c_2 > 0 \)

and:

25) \( A = Q_2 Q_2^* \left[ \pi^* e W^* (e_2^* - \eta_2^*) (e_2 - \eta_2 + s c_2) + \pi W (e_2 - \eta_2) (e_2^* - \eta_2^* + s c_2^*) \right] > 0 \)

As previously argued, the devaluation affects relative prices only if it causes a wealth transfer \((m + m^* \neq 1)\). In particular, the relative price of the non-traded good decreases in the devaluing country (assuming both goods are normal) only if \( m + m^* < 1 \). Dornbusch's results hold since he assumes \( m = m^* = 0 \).

The impact of the devaluation on the Balance of Trade, in terms of the traded good is found by differentiating (21), and substituting in for (22)-(24):

26) \[
\frac{d(B/P_1)}{d(e)} = \left[ \frac{\pi^*}{\pi W + \pi^* e W^*} \right] \left[ \frac{W W^*(l - m - m^*) + k Q_2 (e W^*) \frac{d p}{d e} - k^* Q_2^* \frac{d p^*}{d e}}{P_1} \right]
\]

where sign \((dp*/de) = - \) sign \((dp/de) = \) sign \((1 - m - m^*)\).

Substituting in for \((dp/de), (dp*/de)\) from (23) and (24):

27) \[
\frac{d(B/P_1)}{d(e)} = \frac{\pi^* W W^* (e_2 - \eta_2) (e_2^* - \eta_2^*) (1 - m - m^*)}{P_1 [\pi^* e W^* (e_2^* - \eta_2^*) (e_2 - \eta_2 + s c_2) + \pi W (e_2 - \eta_2) (e_2^* - \eta_2^* + s c_2^*)]}
\]

For \( m = m^* = 0 \), (27) is equivalent to the result derived in Dornbusch (his equation 27).

First, from (27) we see that a devaluation will improve the "real" Balance of Trade if, and only if, \((1 - m - m^*) > 0\), thus, the necessary and sufficient condition for the devaluation to work (in the non-traded and
in the traded good case when the terms of trade effect is ignored) is that it effectively transfers wealth away from the devaluing country. Next, consider the role of the change in the price of non-traded goods. Dornbusch (p. 880) states:

"Given imperfect substitutability between home goods and traded goods on the production side it is the adjustment in the relative price of home goods that translates changes in absorption into an excess supply of traded goods at home and an excess demand for traded goods abroad."

While this statement is open to several interpretations, it would seem to imply that the change in the relative price of the non-traded good (and hence less than perfect substitutability in production) is beneficial in helping to alleviate the Balance of Trade Deficit.

However, from (26) it is clear that changes in the relative prices of the non-traded good in each country offset (part of) the impact effect of the devaluation; the greater the change in these relative prices, the less effective is the devaluation. The underlying explanation for this is clear—the Balance of Trade can be improved only through increasing savings (decreasing dissavings); the decrease in real wealth \((m + m* < 1)\) serves this purpose, but a decrease in real income of the devaluing country has an undesired effect. To the extent that the relative price of the non-traded good decreases (increases) in the devaluing (revaluing) country, this decreases (increases) real income measured in terms of the traded good, thereby decreasing (increasing) savings. Therefore, the change in relative prices does not translate changes in absorption into (desired) changes in the Trade Balance; rather, it is caused by the changes in absorption, and it partly offsets the beneficial aspects of the devaluation.

Specifically, from (27) it can be seen that the efficacy of the devaluation increases with: (1) increases in \(e_2(\epsilon_2)\) and \(\mu_2(\eta_2)\).
and with: (ii) decreases in $C_2(C^{*2})$ and $s(s^*)$; also, (iii) the larger is $\pi(\pi^*)$, the more effective is the devaluation, assuming $(1 - m - m^*) > 0$. 

In words, condition (i) states that the greater the degree of substitutability between the traded and non-traded good, the more effective the devaluation will be, since it will not induce large changes in real income. Similarly, condition (ii) states that high marginal propensities to save out of income, or high marginal propensities to consume the non-traded good retard adjustment because the latter ($C_2$) induces undesired changes in real income, whereas the former ($s$) reflects the (unwanted) changes in savings accompanying this change in real income. Finally, condition (iii) states the obvious—since Trade disequilibria are ultimately wealth (monetary) phenomena, and since the devaluation works through changes in wealth, large marginal propensities to consume out of wealth ($\pi, \pi^*$) facilitate the adjustment process.

The crucial point to note is that the non-traded goods sector retards adjustment, i.e., the more important the non-traded goods sector (measured either in terms of imperfect substitutability with the traded good or in terms of the marginal propensity to consume the non-traded good) the less effective the devaluation. This result is not only in contrast to that of Dornbusch, but other authors as well. For example Jones and Cordon, in the introduction of their recent article, state (p. 151):

"The purpose of this article is to investigate several alternative assumptions concerning the determinants of prices or wages in order to explore the question: must a devaluation for a small country succeed in raising the relative price of traded goods and thus improve the trade balance."

They conclude with the statement that (p. 160), "There will be a balance of trade improvement if the relative price of the traded good rises."

The natural implication is that the greater the change in the relative price of the traded good, the more successful is the devaluation. Our
findings shows that the condition for a devaluation to change the trade balance and the relative price of traded goods is the same, i.e., \( 1 - m - m^* \neq 0 \). However, the larger is the charge in the relative price of the traded good, the less successful the devaluation.

Our results show that the openness of an economy works in opposite directions--on the one hand, it is beneficial since it mitigates changes in real income; on the other hand, it can plausibly be argued that propensities to hold foreign wealth increase with the openness of the economy, thereby decreasing the potency of the devaluation. The net impact of "openness" on the potency of exchange rate changes can only be resolved at an empirical level.

**Section III. Conclusions**

The monetary approach to the Balance of Trade views disequilibria in the Trade accounts as caused, ultimately, by wealth imbalances. Therefore, the primary impact of a devaluation must work through redistributing wealth. To the extent that capital is mobile, the redistributive effects of a devaluation will be less significant, and therefore exchange rate policies will be of little value in correcting deficits (or surpluses) in the Trade Accounts. The economic justification of Optimum Currency Areas rests not only on the efficiency promoted by a common currency among countries that share significant factor mobility, but also on the impotence of exchange rate changes among these countries.

The secondary impact of devaluations, working through changes in relative prices, depends not on how these price changes affect real income, as measured in utility terms, but rather how these relative price changes alter real income, in terms of (some) traded good. It
seems rather pointless to argue that a decline in the Terms of Trade induces people to save less in order to maintain their standard of living, since ultimately they will have to accommodate to this change. More pertinent to the analysis is how these price changes affect long-run wealth demand, and therefore the flow demand for savings. Viewed in this context, we see that the presence of a large sector isolated from world markets impedes the adjustment process.
Footnotes

* The authors are Associate and Assistant Professors of Economics at Iowa State University respectively.

1. See McKinnon or Johnson for the seminal articles on the Portfolio or Monetary Approach.

2. See Aghevli and Borts, Enders or Mathieson for an analysis of the self-correcting nature of Balance of Payments equilibrium.

3. One of the assets in the Frenkel and Rodriguez paper is physical capital which is immobile. Claims on physical capital are, however, perfectly mobile across national boundaries such that the domestic and foreign interest rate must be equal. Further, their paper is restricted to the "small country" case, so that domestic prices rise by the amount of the devaluation.

4. The Balance of Trade in terms of good one is:
   \[ \frac{B}{P_1} = \frac{\tilde{Y}(eW*) - k\tilde{Y}\tilde{W}}{\tilde{W} + eW*} \]

5. The authors initially used two alternative approaches which yielded qualitatively similar results to those presented here. One approach was to imagine that all assets are drawn from a common pool. Letting \( \alpha \) represent the fraction of wealth denominated in pounds, and \( M \) be the degree of capital mobility, the fraction of U.S. wealth held in pounds is \( \alpha M \). If \( M = 1 \), there is perfect capital mobility and if \( M < 1 \) there is a bias towards holding domestic assets. The second approach was to introduce interest bearing assets and to allow residents of a country to have a separate demand function for domestic money, domestic bonds, foreign money and foreign bonds. The composition of assets within portfolios depend upon domestic and foreign interest rates. This second approach proved unsatisfactory for if domestic and foreign bonds are perfect substitutes, the demand "functions" are degenerate, and some further assumption is needed to determine actual portfolio holdings.

6. We assume that each central bank maintains an inventory of foreign assets.

7. Note the similarity between this result and the transfer problem. Since \( m(m^*) \) is the U.S. (U.K.) marginal propensity to "import" assets, a devaluation leads to a transfer of wealth in the desired direction only if the sum of the marginal propensities is less than unity.

8. The magnitude of \( a_0 \) depends upon supply and demand elasticities, but we are only interested in the direction of relative price changes.

9. The condition that \( 1 - m - m^* > 0 \), is not sufficient to guarantee that the devaluation improves the trade balance if the devaluing nation initially has a deficit. The larger the deficit, or the greater the degree of capital mobility, the less likely is it that the devaluation will succeed.
10. It should be noted that the only long run effect of the devaluation is on absolute prices, i.e., relative prices are not affected in the long run. Assuming no net wealth creation by governments, dollar prices increase proportionately to the dollar prices of pound denominated assets.

11. An important point to consider is that asset holders may anticipate a devaluation. To the extent that a devaluation is anticipated, U.S. and U.K. residents will attempt to acquire pound denominated assets. Anticipation of a devaluation, then, reduces the efficacy of any devaluation. Further, frequent devaluations will also lead asset holders to reduce their holdings of the depreciating asset. Thus, barring capital controls, frequent devaluations will do little to alleviate Balance of Trade deficits.

12. The actual derivation is omitted to save space.

13. It should be pointed out that the dollar value of the Balance of Trade may worsen if $m + m^* < 1$, and the pound value may improve even if $m + m^* > 1$.

14. This does not mean that it is the size of the non-traded goods sector which is important, rather it is the propensity to consume non-traded goods which is important.
References


