

PRINCETON STUDIES IN INTERNATIONAL FINANCE NO. 16

The Implications of International
Economic Integration for Monetary,
Fiscal, and Exchange-Rate Policy

Ronald I. McKinnon
and
Wallace E. Oates

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FRITZ MACHLUP
Director

Princeton University
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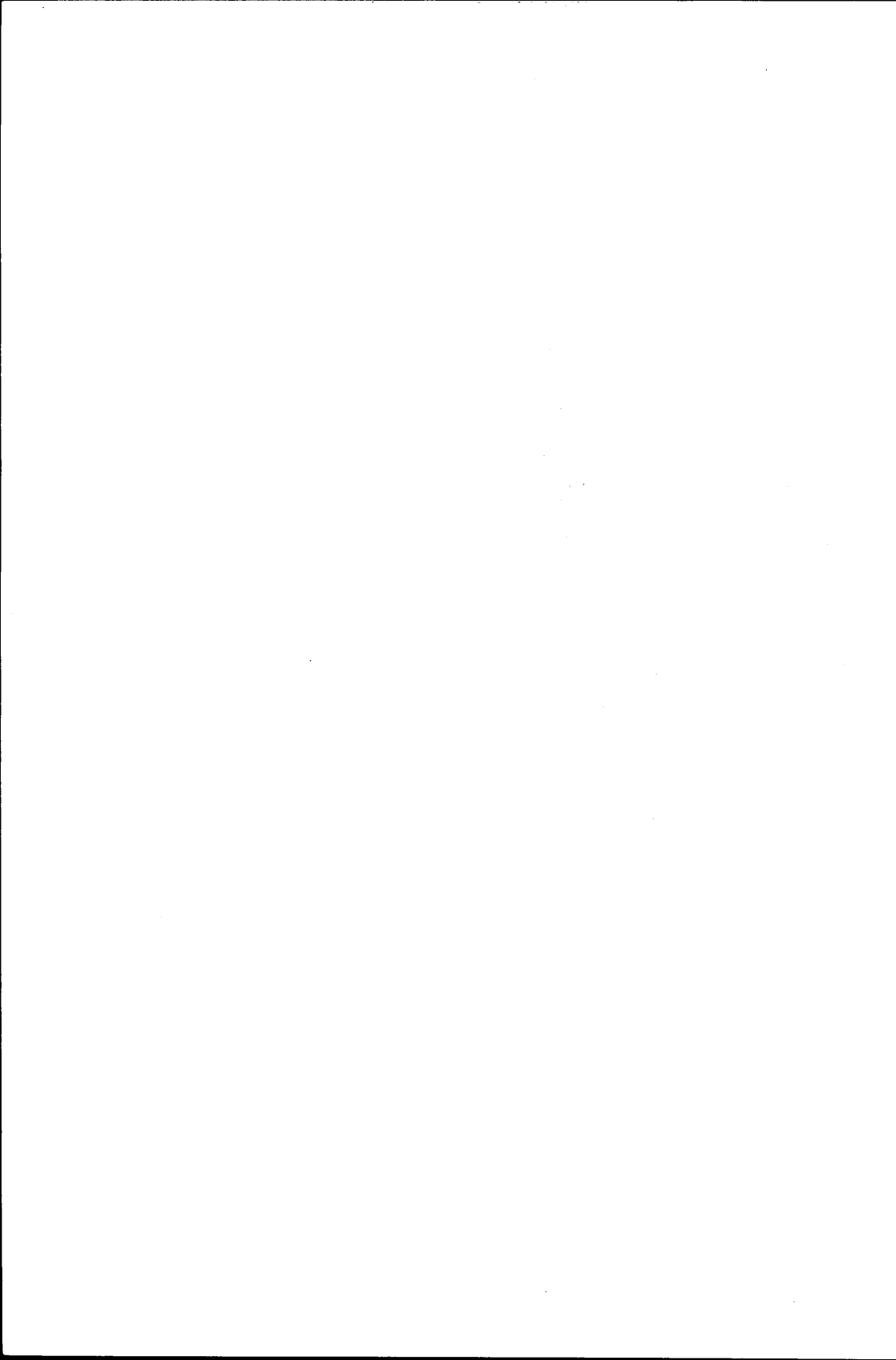
INTERNATIONAL FINANCE SECTION
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THE IMPLICATIONS OF INTERNATIONAL ECONOMIC INTEGRATION FOR MONETARY, FISCAL, AND EXCHANGE-RATE POLICY

INTRODUCTION

The basic macroeconomic problem in international-trade theory, now firmly imbedded in most textbooks on the subject, is the reconciliation of a country's internal employment-income equilibrium with an external balance in its international payments.¹ Monetary, fiscal, and exchange-rate policies with differential effects are viewed as instruments to be used in achieving this reconciliation. Although this traditional neo-Keynesian viewpoint is still very relevant for many current policy issues, increasing economic integration in commodity trade and in international capital markets suggests that a somewhat different basic analytical approach may also be useful.

Let us begin by assuming that there exists an *automatic* adjustment mechanism of a kind that would restore balance in a country's or region's external payments, if given time to work itself out free from official interference—even in the absence of floating exchange rates or flexible internal prices. The exact nature of this adjustment mechanism will be developed in due course, but it is clear that its existence resolves one of the two central problems of the neo-Keynesian approach—the achievement of external balance. In this sense, this assumption is more “classical” in outlook. However, it is undoubtedly a highly relevant assumption for interregional payments adjustment within a country and is becoming more relevant for intercountry payments flows as economic integration proceeds—as recent experiences in Canada, Germany, and Israel tend to suggest. It has significant implications for the ability of regional and national governments to control their internal income and employment. In this paper, we propose to accomplish the following:

1. To build a simplified model of the automatic adjustment mechanism based on modern methods of portfolio-balance analysis describing the private sector of the economy; and to outline the circumstances under which this mechanism will be a powerful

We are indebted to Professor Paul David of Stanford University for his helpful comments on an earlier draft of this paper.

¹ Meade's original treatise on the subject [6] still stands as the most comprehensive work available.

economic force in adjusting the balance of payments in response to exogenous shocks.

2. To link this model to the exchange-reserve requirements of a system of fixed exchange rates where different degrees of economic integration among nations exist. For example, does the size of a country's foreign-trade sector or the size of its GNP determine its reserve requirements?
3. To look at the internal income-generating effects of inside and outside money creation in the presence of such an adjustment mechanism under alternative arrangements of fixed and floating exchange rates.
4. To look at the impact on domestic income and employment of both balanced-budget and deficit-financed fiscal policy under fixed and floating exchange rates. Special emphasis will be placed on the income-generating capacity of regional governments in a federal system with obvious parallels to be drawn for national governments in the emerging free-trade areas of Western Europe.
5. To interpret important questions of economic policy for both regional and national governments.

Points 3 and 4 are extensions of and amendments to the paper by R. A. Mundell [7], which in turn is related to the work of J. Marcus Fleming [1]. Mundell's path-breaking paper does not incorporate a complete model of portfolio balance, nor does it distinguish between inside and outside money creation or alternative kinds of fiscal policy. Yet, it will become obvious that the present paper is highly dependent on Mundell's work.

I. THE ECONOMIC ENVIRONMENT AND THE ADJUSTMENT MECHANISM

Capital Mobility, Portfolio Balance, and Aggregate Expenditures

Economic integration among nations has two dimensions: the size of commodity trade relative to GNP and the degree of capital mobility.² Both dimensions are important in determining the strength of automatic adjustment tendencies among countries. We shall follow Mundell in using the limiting assumption of perfect mobility of international capital in order to simplify our analysis. By perfect capital mobility we mean that there exists a large body of financial assets that are perfectly mobile internationally so that the market rates of interest established on these assets are the same inside the economy and in

² It is quite possible for integration in commodity trade to be well developed without capital mobility, as within the EEC. It is also possible to have capital mobility without much commodity trade, as between Europe and the United States prior to American restrictions on capital movements.

the outside world. It is a matter of complete indifference to the holders of these financial assets whether or not they are denominated in foreign or domestic currency—they do not feel any exchange risk.³ If, in addition, we assume the country in question is small relative to the world's financial markets, then we can also assume that this interest-rate structure is determined externally through international arbitrage and cannot be influenced by domestic economic policy. For convenience, we shall refer to this externally fixed structure of interest rates on internationally mobile assets as “the rate of interest.”⁴

It is important to place some limitations on the extent to which capital mobility is being assumed. All financial claims in the economy need not have this property of perfect international substitutability. As an illustration, within the United States and only in this century have federal government securities been established as interest-bearing assets which are perfectly mobile nationally. There are still plenty of local or regional financial claims for which national markets are not established. However, for our model to work, the body of internationally acceptable claims must be significant; and, most importantly, *these international assets must be the financial instruments that the government uses in changing the money supply or in covering any current-account budget deficits.* In addition, individuals in the private sector of the economy must attempt to maintain portfolio balance in terms of these international assets. That is, for a given rate of interest and level of real income, individuals will attempt to maintain a definite portfolio mix of money and internationally mobile securities. Money is assumed *not* to be an international asset, being only legal tender within the country under consideration.⁵ Presumably individuals also make portfolio-balance adjustment in noninternational financial assets, but our model does not explicitly recognize this fact. For example, the ratio between internationally mobile assets and other less mobile domestic assets may be a goal of portfolio balance and is perfectly consistent with our model.

The second dimension of international economic integration is inter-

³ It may seem strange that one would associate this extreme assumption with floating exchange rates. However, given the existence of well-developed forward-exchange markets, the Canadian experience does suggest this assumption has empirical relevance.

⁴ This invariance of the rate of interest to domestic economic policy is strongly reminiscent of the Keynesian liquidity trap. If the country in question is “large” in the world's capital markets, its economic policies can only affect its internal rate of interest insofar as it affects worldwide interest rates. For analytical convenience, we shall maintain the small country assumption.

⁵ One does not have to go far to find examples where a country uses other nations' currencies, legally or illegally, in its domestic circulation.

national trade in physical commodities. As long as "domestic" prices remain fixed relative to foreign prices, we assume that expenditures at the margin by domestic nationals at any given income level will be distributed in a given proportion between domestic and imported goods, that is, marginal imports are proportional to marginal aggregate expenditures. The greater these expenditures for imports as a proportion of total expenditures, the more "open" is the economy in our terminology. Belgium, for example, has a highly open economy with 45 per cent of its expenditures going for imports, and the American economy is relatively closed with less than 4 per cent of total expenditures going for imports. If one relies on variations in aggregate expenditures as a control device, the trade balance of an open economy can be controlled more efficiently: a one dollar decrease in aggregate expenditures improves the Belgian balance of payments by \$.45 and by only \$.04 for the American, if marginal and average propensities to import are the same. Throughout the paper we shall be concerned with variations in aggregate expenditures arising out of deliberate monetary and fiscal policy, as well as those due to changes in the individuals' portfolio positions originating in the trade balance itself.

Inside and Outside Money Creation

Our simple open economy with its stationary equilibrium positions and fixed external rate of interest can be easily described by a set of equations relating the stock of money, the stock of international securities (henceforth simply called "bonds"), the level of real income, and the trade balance. This is done in the following section. However, an informal preview of the workings of the automatic external-adjustment mechanism can be obtained simultaneously with the consideration of inside and outside methods of money creation. It turns out that the degree of economic integration that we have assumed completely frustrates *both* kinds of monetary policy if the monetary authorities attempt to maintain a fixed exchange rate.

Consider how the government can attempt to alter the composition and total stock of financial assets in the economy. Government monetary policy acts on the money supply either: (1) through an *inside* creation of money, which is usually accomplished through the purchase of bonds from the private sector; or (2) through an *outside* injection of new money into the system by some means which does not involve a withdrawal of assets from the private sector, as, for instance, by means of temporary budget deficits covered by money issue. Inside money creation, that is, the creation of money through open-market operations, leaves the *net* stock of financial assets held by the private sector unchanged; thus, it has no direct wealth effect on expenditures

for real commodities. In contrast, outside money creation, where the injection of new money is not accompanied by an equivalent removal of financial assets from the private sector, does increase the net asset holdings of the private sector and its propensity to spend. Thus, an outside creation of money has a positive wealth effect on spending on commodities, while an inside injection of new money into the economy has no such effect. This distinction between inside and outside means of money creation is interesting analytically in a closed system because the equilibrium rate of interest is dependent upon the method of money creation chosen by the authorities, as shown by Gurley and Shaw.⁶ However, in our small economy with perfect international mobility of capital, the rate of interest is fixed externally so that it is independent of the method of money creation adopted. Thus, monetary policy cannot operate through the usual route of changing interest rates.

What international mechanisms are analogous to the inside-outside methods of money creation, and how might these offset official government policy? If private individuals sell bonds to foreigners in order to acquire domestic money—which they can do in a system of fixed exchange rates—the effect is analogous to an inside creation of money. The net wealth holdings of the private sector remain unchanged. Suppose we start off with an economy in a state of equilibrium and the government makes a nonrecurrent purchase of bonds from the private sector—an inside creation of money. The resulting downward pressure on the domestic interest rate (which is only temporary, since, as noted above, the equilibrium rate of interest is fixed externally) induces private individuals to purchase bonds from foreigners at the fixed foreign rate of interest. This purchase of foreign bonds takes the newly created domestic money out of the hands of private individuals and places it with the foreign-exchange authorities, who must draw on their foreign-exchange reserves in order to provide the foreign currency which the buyers of the securities need to pay the sellers abroad. Thus, the government will find that its commitment to a fixed exchange rate means it cannot control, by inside means, the amount of money in the economy in the presence of capital mobility.⁷ The effect is the same as if the government in a closed economy attempted to peg the price of bonds by buying and selling freely at a fixed rate of interest to private individuals at their request. The supply of money is then determined by the private sector.

⁶ J. G. Gurley and E. S. Shaw, [3]. For a very good, concise statement and further development of their ideas, see Don Patinkin, [11].

⁷ Mundell's analysis [7] was in terms of inside money creation only and he reached this conclusion.

Commodity trade and the possibility of deficits or surpluses in the balance of trade provide an avenue for changing the *net* stock of financial assets in the economy. Thus, here we have a means of injecting new financial assets into the economy which is analogous to an outside creation of money. This is true under systems of both fixed and floating exchange rates. The financial counterpart of a surplus in the trade balance with the outside world is the acquisition of financial assets (the liabilities of foreigners). This acquisition can take the form of increases in net bond holdings as a *quid pro quo* for the surplus commodity flow, or part of these incremental bond holdings can be converted into domestic money in the case of fixed exchange rates. Thus, the net stock of financial assets of the private economy increases as a result of the trade surplus, just as it would in the case of a deficit in the government budget.

Notice the implications of these outside methods of changing the stock of financial assets in the economy. Consider a government policy that achieves a "once-and-for-all" outside increase in the economy's stock of financial assets. At the old level of income, there will be portfolio imbalance with an excess supply of financial assets and an excess demand for commodities. Spending for commodities will rise and will temporarily increase money income. Imports increase and the trade balance goes into deficit if a fixed exchange rate is maintained. This deficit drains financial assets out of the system, removing their excess supply and forcing the equilibrium level of income down to its original position. Thus, *under fixed exchange rates, the government finds that it cannot permanently alter the stock of assets in the economy, although the offsetting international mechanism is somewhat different from that operating in the case of inside money creation. It depends on commodity flows through the trade balance rather than on purely financial capital movements.*

The Formal Model

For the most part, our analysis assumes a Keynesian environment with rigid internal prices of domestic goods and services (including labor) denominated in the domestic currency. Slack in the economy exists with involuntarily unemployed resources. The economy is sufficiently small that tradable goods—importables and exportables—have their prices fixed externally (in terms of foreign currency) and thus the domestic-currency prices of these goods are determined by the exchange rate. Hence, a fixed exchange rate implies constancy of relative prices between tradables and nontradables⁸ and constancy also in

⁸ For a more extensive discussion of the distinction between tradables and nontradables, see R. I. McKinnon, [4].

the share of imports in total expenditures. However, the profitability of exporting is assumed to depend on relative domestic and foreign prices. Thus, with Keynesian conditions existing both internally and externally, the exchange rate determines the level of exports and, under a system of fixed exchange rates, exports will be fixed unless external demand shifts.⁹

The case of fixed exchange rates avoids any index-number problems in the definition of "real" income, Y , associated with the production of physical commodities. The relative prices of goods and services that would enter foreign trade (tradables) are fixed relative to those that cannot (nontradables). Hence, these fixed prices can be used as weights in constructing Y . However, if we raise the exchange rate, k (the domestic-currency price of foreign exchange), the domestic-currency prices of tradables rise while the domestic prices of nontradables are constant. Economic incentive then exists for traders to expand exports and curtail imports, which of course stimulates domestic income. However, the rise in money income will be proportionately greater than the rise in real income because of the increase in the domestic-currency prices of tradables (due to the increase in the exchange rate). An index-number problem now arises in evaluating real income relative to its initial position. But it is sufficient for our analysis simply to note that real income moves qualitatively in the same direction as money income in response to a shift in the exchange rate, although the shift in real income is not as large.

Throughout, we shall use the analytical convenience of comparing equilibrium income positions of a *stationary* character where net investment is zero, although the *marginal* propensity to save is positive.¹⁰

⁹ In a Keynesian environment, the barrier to achieving a full-employment level of output is insufficient aggregate demand. If we were to assume that domestic producers could export unlimited quantities at a given domestic price, then the whole problem of income generation would vanish, for the economy would move directly to a full-employment state. The usual Keynesian escape from this difficulty is simply to take the level of exports as exogenously determined. It is more useful for our purposes to constrain export demand by assuming what amounts to increasing selling costs at a given exchange rate. Because the outside world is also "Keynesian," the economy in question is constrained in what it can sell at any given price but not in what it can buy.

¹⁰ In constructing a simple stationary Keynesian model of the circular flow of real income, we must make sure that it is consistent with portfolio-balance considerations. The well-known difficulty that a stationary-equilibrium level of income is inconsistent with positive net investment can be thought of in portfolio terms where positive net investment increases the stock of real wealth in the economy—which may or may not be associated with the creation of liquid financial assets. Mundell has recently shown [10] that for a closed economy, these increments to the stock of assets cannot be ignored in determining the rate of interest or the equilibrium level of income. We avoid this problem by assuming that net savings

However, it is not difficult to extend our conclusions to cover growth situations.

We are now ready to specify formally the relationships linking portfolio balance, aggregate expenditures, and balanced commodity trade within our highly simplified economic environment. We shall assume a fixed exchange rate, $k = k_0$, throughout most of the formal presentation. Where the presence of floating exchange rates would alter our conclusions, this will be indicated; but the reader will be spared the details of a complete alternate formal presentation which must be worked out in "money" rather than "real" terms.

It is very convenient analytically to make further use of the assumption of an externally fixed interest rate (the relative price of money and bonds) to combine money and bonds into a single financial variable.

Let A denote the actual stock of net financial assets in the economy. It consists of money plus bonds where bond holdings can be negative, $A = M + B$.

Let $L(Y, A, i_0)$ denote the total ex ante demand for financial assets, which is a function of income, actual asset holdings, and the rate of interest—a given parameter. Behind the scenes, individuals also have a desired bond-money mix for given values of Y, A , and i_0 .

Let $F = F(Y, A, k_0, i_0)$ denote the total ex ante *domestic* demand for commodities, both domestically and foreign produced. It should be noted that the demand for commodities is a demand for a *flow*, while the demand for financial assets is for a *stock*.

Let $X = X(k_0)$ denote exports.

Let $I = I(Y, A, k_0, i_0)$ denote the demand for imports which is a portion of F depending on the economy's openness.

In equilibrium, the aggregate demand for commodities equals their aggregate supply, a balance exists in international flows of commodities, and the demand for and the supply of financial assets are equal.

$$(1.1) F(Y, A, k_0, i_0) + X(k_0) - I(Y, A, k_0, i_0) - Y = 0. \text{ Commodities}$$

$$(1.2) X(k_0) - I(Y, A, k_0, i_0) = 0. \text{ Trade Balance}$$

$$(1.3) L(Y, A, i_0) - A = 0. \text{ Net Financial Assets}$$

in the economy are zero when equilibrium income levels are attained. In equilibrium, the marginal propensity to save is positive, but individual behavior is such that the average propensity to save is zero. More precisely, if income in the private sector of the economy increases while private holdings of financial assets remain unchanged, individuals will endeavor to "save" ex ante out of this incremental income in order to build up a commensurate increase in their holdings. However, once asset holdings increase in the desired proportions, private net saving ceases.

Notice that we have three equations and only two variables to be endogenously determined: A and Y . Equation (1.1) is the familiar Keynesian condition for determination of the equilibrium level of income when the problem of portfolio balance is ignored. That is, the net domestic demand for commodities, F , plus *net* foreign demand, $X - I$, must equal the realized level of income, Y , when the economy is in equilibrium. Equilibrium condition (1.2) specifies a zero trade balance, which is a necessary condition for A to remain unchanged. Together, (1.1) and (1.2) imply (1.3); that is to say, individuals achieve their desired asset holdings. The easiest way to see why (1.1) and (1.2) together make (1.3) redundant and assure the achievement of portfolio balance is to subtract (1.2) from (1.1) to get

$$(1.1) - (1.2) \quad F(Y, A, k_0, i_0) - Y = 0.$$

(1.1) - (1.2) simply says that total *domestic* demand for commodities, F , equals realized production, Y . Thus, there is no excess domestic demand for commodities. Since individuals are limited in using their purchasing power to acquire *either* commodities *or* financial assets, from Walras' law we know that zero excess demand for commodities implies zero excess demand for financial assets. Therefore, (1.3) is redundant, and our equilibrium conditions reduce to two independent equations in two unknowns, Y and A . Nevertheless, symmetrical consideration of (1.3) is conceptually useful as an explicit specification of portfolio balance.

What are the stabilizing forces which assure that our equilibrium conditions (1.1) and (1.2) are meaningful so that Y and A tend to converge to their equilibrium values? As in all simple Keynesian models, we assume a positive net marginal propensity to save *ex ante* out of current income for a given A . Thus, the usual Keynesian argument for stability applies when the *ex ante* demand for commodities (both domestic and foreign) and realized income differ. However, in addition, we have assumed that individuals wish to keep their net asset holdings, A , in a specified relation to the level of income, Y . This last assumption implies that any deficit or surplus in the trade balance must eventually be eliminated. For example, in the case of a trade deficit, the economy will tend to lose outside financial assets. Individuals then curb their real expenditures for commodities in order to rebuild their financial asset position. This depresses income in general and the demand for tradables, including imports, in particular. Thus, eventually the trade deficit must be eliminated. The more open the economy, the faster and more powerful will be this equilibrating tendency.