# Policy and Current Account Determination Under Floating Exchange Rates

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*The determinants of current account imbalances under floating exchange rates are analyzed. The analysis provides a framework within which the sources of, and the remedies for, the current account imbalances between the United States, Japan, and the Federal Republic of Germany can be discussed. The effects of various government policies are emphasized, in particular the differences between expenditure-changing and expenditure-switching policies. Short-run and long-run considerations are investigated, as well as the role played by expectations and price-level dynamics.* [JEL 431]

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THE PURPOSE of this paper is to analyze the determinants of current account imbalances under floating exchange rates. Although detailed references to current policy controversies are relatively limited, an important goal of the analysis is to provide a framework within which the sources of, and the remedies for, the current account imbalances between the United States, Japan, and the Federal Republic of Germany can be discussed. For this reason, particular emphasis is put on the effects of various types of government policies, with particular stress on the differences between expenditure-changing and expenditure-switching policies. We distinguish between short-run and long-run considerations and investigate the role played by expectations and price-level dynamics.

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Current account determination has, of course, been an integral part of many macroeconomic models of open economies with flexible exchange rates. In much of the literature before the early to mid-1970s, current account balance served as an equilibrium condition determining the exchange rate at each point in time. With the advent of monetary and, more generally, asset market models of exchange rate determination, the current account temporarily disappeared from consideration as emphasis was shifted to equilibrium conditions in asset markets. It was subsequently reintroduced, in part to show that goods markets may be important for exchange rate movements and in part to provide an intrinsic source of dynamics linking the impact effects of disturbances with medium-term and long-term effects.[1] Despite the inclusion of the current account in these models, the focus of the analysis was not the same as ours—that is, the relative impact of different types of government policies on the current account itself.

In response to the external imbalances of the United States, Japan, and Germany in the 1980s, a literature has emerged that emphasizes the influence of fiscal policy on these imbalances.[2] Our analysis extends this literature by investigating not only the effects of changes in taxes and government expenditures on the current account but also the impact of other policies such as import controls, taxes on capital movements, monetary policy, and the like, and by attempting to assess the relative effectiveness of each.

Throughout the analysis we deal with a flexible exchange rate regime that implies, contrary to what is implicitly assumed in much of the official and popular discussions, that neither the nominal nor the real exchange rate is a policy instrument. It follows that questions such as "How much must the dollar come down in order for the U.S. current account deficit to disappear?" cannot be answered unless the reason for the decline of the dollar is specified. In an attempt to investigate the effects of "talking down the dollar," we specify two types of disturbances: an exogenously imposed risk premium on U.S. dollar assets and an exogenous change in the expected future value of the dollar. We argue that these types of "policies" are inefficient as instruments of current account adjustment. We also show that many other proposed remedies—for instance, that the United States should put restrictions on goods that are imported from countries with significant trade surpluses—also have a limited effect on the current account balance of either country.

We argue that, as a general rule, expenditure-changing policies have the most direct and quantitatively strongest influence on the current

[1] For a clear and extensive review of this literature, see Gross (1987).

[2] See Branson (1985), Bryant and Holtham (1987), Feldstein (1986), Hooper (1984), Masson and Knight (1986), and Morris (1988).

account. Expenditure-switching policies, in contrast, affect the exchange rate significantly but have only a limited impact on the current account. We also show that fiscal policy has a comparative advantage over monetary policy as an instrument for current account adjustment as opposed to domestic aggregate demand stabilization.

The organization of the paper is as follows. Section I presents the analytical framework of the paper, first by explaining why partial equilibrium approaches to current account determination are likely to lead to misleading conclusions and then by outlining a two-country general equilibrium model capable of explaining simultaneously, among others, the current account, the real exchange rate, and the real interest rate. In Section II the responses of the endogenous variables to various shocks are derived under the assumption of price flexibility. An important distinction is made between the determinants of the rate of interest, on the one hand, and the real exchange rate and the current account, on the other. The interest rate is shown to depend on the *sum* of national variables (for example, the sum of national government expenditures), whereas the other two variables depend on the *difference* between them. It is also shown that expenditure-switching policies are not effective instruments for current account adjustment, but that expenditure-changing policies are.

In Section III the case of fixed prices and variable output is analyzed. The main difference this introduces, relative to the conclusions of Section II, is that monetary policy and expenditure-switching policies now become effective tools for current account adjustment. It remains true, however, that expenditure-changing policies have a relatively stronger impact.

Section IV introduces elements of dynamics. Changes in net foreign asset positions stemming from current account imbalances are shown to lead to longer-run exchange rate adjustments that are significantly different from the short-run responses. Dynamics are also introduced through exchange rate expectations and gradual price-level adjustments. The first appreciating and then depreciating path followed by the U.S. dollar since the early 1980s is interpreted in terms of the dynamic adjustment mechanisms introduced in the section.

Section V pulls together the main results and relates them to present concerns about current account imbalances and currency misalignments.

## I. The Need for a Macroeconomic Perspective

Popular analysis of the determinants of current account imbalances and exchange rate movements is often based on simplified and partial analytical paradigms. As a result, the wrong questions are frequently

asked, and inappropriate (or, at best, incomplete) conclusions are drawn, as the examples below will show. A major problem is that the distinction between endogenous and exogenous variables is not always made explicit—witness questions such as "What is the effect of a dollar depreciation on the U.S. current account?" In this section we first illustrate why partial equilibrium approaches are not adequate for an analysis of exchange rate movements and current account adjustment under floating exchange rates. We then present a small general equilibrium model that encompasses the most popular partial approaches and that will form the basis for the analysis in the remainder of the paper.

## The Trade Balance Approach

Because a large component of the current account balance is equal to the difference between the value of exports and the value of imports, it is natural to seek explanations for imbalances by attempting to explain flows of trade in goods and services. Typically, such explanations focus on movements in some measure of the real exchange rate and on movements in output by analogy with relative price and income effects in consumer demand theory. Questions are then asked about the current account implications of changes in the exchange rate or changes in income. For instance, recently much effort has been spent on estimating the effects of the post-1985 fall in the value of the U.S. dollar and of different growth scenarios in the United States, Europe, and Japan. Answers are provided by referring to estimates of partial equilibrium price and income elasticities of demand for exports and imports. Similarly, but at a more analytical level, target-zone proposals for exchange rate management often rely on a trade balance approach to calculate the "appropriate" exchange value for major currencies.

The problem with this type of analysis is that it proceeds as if the reason for exchange rate changes did not affect trade flows, or as if income growth brought about by an expansion in demand had the same effects as growth brought about by technological advances. Both suppositions are, of course, erroneous. As will be shown formally below, in an environment of floating exchange rates the general equilibrium relationship between the real exchange rate and the trade balance will depend on both the *source* of the change in the exchange rate and on a host of parameters in addition to the import and export demand elasticities. Similarly, the current account implications of income growth will be different depending on whether the latter is due to a shift in aggregate supply or in aggregate demand.

The trade flow approach also tends to be used by those who argue that commercial policy actions have well-defined current account implications. Restrictions on imports through tariffs or nontariff barriers to trade are thought to improve the external balance, whereas such restrictions are actually more likely to reduce the volume of *both* exports and imports, leaving the difference to a large extent unchanged.

Finally, the partial equilibrium nature of the trade balance approach often implies that exchange rate and income changes are treated as exogenous variables, each of which can be independently influenced by government policy. Monetary and fiscal policy measures are thus not often considered explicitly.

Although the above points may seem obvious, they are not regularly taken into account in current policy analysis. For instance, one frequently sees estimates of the current account effects of past changes in the yen-dollar exchange rate without any attention being paid to the origin of these changes. Also, some of the trade legislation currently being considered in the U.S. Congress is based on the notion that trade imbalances are in part the result of commercial policy practices outside the United States, and that they therefore can be redressed by corresponding trade policies in the United States.

## The Savings-Investment Approach

National income accounting implies that a current account surplus is equal to the difference between domestic income and domestic absorption. This difference can in turn be expressed as the sum of the public sector's budget surplus and the private sector's excess of saving over investment. Government policy (especially fiscal policy) is, in this way, brought directly to the forefront of the analysis, and intertemporal considerations are emphasized. Variations in the real interest rate—that is, the intertemporal terms of trade—and differences between current and expected future income are likely to influence both the savings behavior of households and the investment decisions by firms. Future income is in turn likely to depend on expectations of future changes in taxes and government spending. Fiscal policy again takes on particular importance.

Although the savings-investment approach steers attention in the appropriate direction, it too can result in incomplete interpretations unless it is considered within a larger general equilibrium setting. Specifically, determinants of saving and investment, such as the real interest rate and national income, should be treated as endogenous variables that respond to exchange rate changes, to foreign as well as domestic fiscal

policy actions, and to disturbances in asset markets. This suggests that a comprehensive analysis of current account determination requires a complete macroeconomic model capable of explaining simultaneous movements in several variables and in which both the trade balance and the savings-investment approaches can be fully interpreted. In the following subsection we describe the outlines of such a model, which will be used in the subsequent analysis.

## A Minimal General Equilibrium Approach

To couch the analysis in a familiar setting, we shall be using slight variants of mainstream open-economy macroeconomic models. The basic structure will be that of the well-known Mundell-Fleming model,[3] but we shall consider extension of it to account for a less than perfectly elastic aggregate supply curve, expectation formation, and dynamics owing to current account imbalances and attendant international redistribution of wealth. Two countries are considered explicitly. To capture the effects of monetary as well as real disturbances, equilibrium conditions in asset markets will be used alongside those in goods markets. Trade takes place in assets as well as goods.

Goods-market equilibrium obtains when the demand for a country's output is equal to the supply. Each of the two countries in the model specializes in the production of one good but consumes both. The demand for the domestic good can be written as the sum of private sector real absorption, government spending, and the trade balance:

$$y^d = a + g + tb, \tag{1}$$

where

$y^d$ = the demand for domestic output
$a$ = private sector real absorption
$g$ = government expenditures
$tb = x - e \cdot im$, the trade balance measured in terms of the domestic good
$x$ = real exports
$im$ = real (in terms of the foreign good) imports
$e$ = the real exchange rate, equal to the relative price of the foreign good in terms of the domestic good, or the inverse of the home country's terms of trade.[4]

[3]See Frenkel and Razin (1987b) for a recent expositional evaluation of that model.

[4]This definition of the real exchange rate seems the most natural one in a two-good context. A frequently used alternative definition is the ratio of the two

Analogously, aggregate demand for the foreign good (with foreign variables denoted by an asterisk) is

$$y^{d*} = a^* + g^* - (1/e)tb. \tag{2}$$

Goods-market equilibrium obtains when the demand for the two goods is equal to the supplies ($y$ and $y^*$), as in equations (3) and (4):

$$y^d = y \tag{3}$$

$$y^{d*} = y^*. \tag{4}$$

The current account balance ($ca$) is equal to the trade balance plus interest income on net foreign asset holdings. Letting $(b - B)$ stand for the net foreign asset position,[5] and $r$ for the real interest rate earned, we have

$$ca = tb + r(b - B). \tag{5}$$

Given that private sector absorption is equal to consumption plus investment, that consumption equals disposable income minus saving, and that disposable income equals output net of taxes plus interest income, equations (1), (3), and (5) imply that

$$ca = (t - g - rB) + (s - in), \tag{6}$$

where

$t$ = real tax revenue
$s$ = real private sector saving
$in$ = real private sector investment.

Equations (5) and (6) show that, *in the context of a complete model in which goods market equilibrium is maintained*, the trade balance and the savings-investment approaches to current account determination yield equivalent conclusions.[6]

Money market equilibrium is defined by equations (7) and (8), where $P(P^*)$ stands for the domestic (foreign) price index and $i$ represents the nominal rate of interest:

countries' general price levels expressed in terms of the same currency. It is easy to show that this is equivalent to $e^{\alpha-\alpha^*}$, where $\alpha(\alpha^*)$ is the share of the domestic good in the domestic (foreign) price index. For a further discussion, including extensions to models containing nontraded goods, see Saidi and Swoboda (1983).

[5]The only nonmonetary asset that is being considered is a real asset of which domestic residents hold a quantity $b$. The domestic government has issued a quantity $B$ of the same asset. The net position of the domestic economy is thus $b - B$.

[6]Note that $t - g - rB$ equals the domestic government's budget surplus.

$$\frac{M}{P} = L(y, i) \tag{7}$$

$$\frac{M^*}{P^*} = L^*(y^*, i^*). \tag{8}$$

Throughout the analysis we assume perfect substitutability between domestic and foreign assets. As a consequence, domestic and foreign nominal rates of interest are linked by the following interest parity condition:

$$i = i^* + \hat{E}^e + \lambda. \tag{9}$$

In equation (9), $\hat{E}^e$ stands for the expected rate of depreciation of the domestic currency, and $\lambda$ represents an exogenously determined "risk" premium.[7] This risk premium is introduced in an attempt to model the notion of "talking down the dollar." It is analogous to a tax on capital mobility discussed, for instance, in Buiter (1986).

Using definitions of the domestic and foreign price indices and the Fisher relationship between nominal and real rates of interest, it is possible to derive an equation analogous to equation (5)—but in terms of the real rates of interest and the real exchange rate, as in equation (10) where $\alpha(\alpha)^*$ is the share of the domestic goods in the domestic (foreign) price index:[8]

$$r = r^* + (\alpha - \alpha^*)\hat{e}^e + \lambda. \tag{10}$$

In Section II the model defined by equations (1)–(10) will be used together with the assumption of exogenously given output levels (full employment) to determine, first, the real exchange rate and the real interest rates and, then, the current account. In Section III we investigate the other extreme case, in which prices are fixed but output is variable. In both cases we proceed under the assumption of static exchange rate expectations. In Section IV we relax this assumption in favor

[7] $E$ is the nominal exchange rate measured as the domestic currency price of foreign exchange, and a circumflex (^) stands for a percentage rate of change. In Section IV we comment briefly on the consequences of introducing less than perfect substitutability between domestic and foreign assets by making $\lambda$ a function of relative asset supplies.

[8] A mathematical appendix that contains this and other derivations used throughout the paper can be obtained from the authors on request. The intuition behind equation (10) is that the expected change in $e$ leads to interest rate differentials because the domestic real rate is defined in terms of the domestic consumption basket and the foreign rate in terms of the foreign consumption basket. Variations in the relative prices of these baskets, which depend on $e$ and $(\alpha - \alpha^*)$, will lead to variations in the interest rate differential.

of the hypothesis of long-run perfect foresight, which requires a brief discussion of the steady-state properties of the model. We also introduce price adjustment rules in the form of Phillips curves.

Standard specifications of the absorption, export, and import functions will be maintained throughout. We do not attempt to derive individual behavioral relationships from an explicit theory of dynamic optimization by economic agents because this would require far-reaching changes in the model.[9] Whether our results would be modified significantly by such a radical change in the analytical approach is, of course, difficult to tell; on the basis of a comparison of our results with corresponding ones in the Frenkel-Razin study (1987a), however, we conjecture that they would not. We thus assume that absorption depends positively on disposable income and wealth, and negatively on the real interest rate.[10] The trade balance improves with increases in foreign absorption and the real exchange rate and deteriorates with increases in domestic absorption. Furthermore, to investigate the consequences of expenditure-switching policies, we assume that some government spending may fall on the import good.

The advantage of using a complete model to study the determinants of the current account will become clear as the analysis proceeds. In particular, this approach makes it necessary to state the conditions for improvements in the current account in terms of required adjustments in exogenous *policy instruments* rather than in terms of movement in endogenous variables such as the real exchange rate. Furthermore, it will be seen how expenditure-switching policies resulting from commercial policy actions or from changes in the commodity composition of government expenditures—that is, between expenditures on domestic goods and on imports—in some cases have no effect on the current account, contrary to the impression that might be given by looking at equation (5) in isolation.

[9] For a comprehensive study of the effects of various types of fiscal policies on relative prices, real interest rates, and current and capital account balances in such a model, see Frenkel and Razin (1987a). That study contains an extensive list of references to the emerging literature that makes use of optimizing models as well as to studies using a more traditional analytical framework.

[10] We do not distinguish between investment and consumption expenditures in our definition of absorption. The negative interest rate effect could come from either source, although allowing explicitly for investment and changes in the capital stock would needlessly (for our purposes) complicate the dynamic properties of the model. Note that our specification of the absorption function is consistent with a Metzlerian savings function in which households save in order to attain a target level of wealth.

## II. Medium-Term Determinants of the Current Account

In this section we consider a time horizon that is long enough for prices to clear goods markets. We also suppose that output is fixed in supply (at $y^f$ and $y^{f*}$), and that we can ignore the effects of changes in net foreign asset positions on spending. In the first subsection we also abstract from wealth effects that arise from terms of trade changes. These and other extensions of the basic analysis will be taken up in the remaining subsection.

### Central Results Under Symmetry

Before discussing the determinants of the current account balance, we must examine the implications of the model for movements in the real rates of interest and the real exchange rate. We have already noted that the real rate of interest measures the intertemporal terms of trade; that is, the relative price of future and current consumption. As such, one might expect it to be determined mainly by the time profile of consumption demand in relation to the time profile of supply. For a given path of output, an increase in the demand for current consumption relative to future consumption must bring about an increase in the relative price of the former; that is, an increase in the rate of interest. Similarly, an increase in current output would tend to lower the rate of interest. In an international context with integrated asset markets, such that rates of interest are equalized among countries, the source of the change in demand or supply is unimportant. To a first approximation, only world aggregates are important.[11]

The composition of demand, in contrast, should be crucial for the real exchange rate, since it measures the current relative price of foreign goods in terms of domestic goods. A switch in demand toward the foreign good or a relative fall in the supply of the domestic good would both lead to a real depreciation of the domestic currency; that is, to an increase in $e$. Contrary to its effect on the rate of interest, a balanced (between goods) increase in aggregate world demand or supply should have no effect on relative prices.

The intuition in the last two paragraphs is borne out by formal analysis of the model introduced in the previous section (and described more fully in the mathematical appendix, available on request). Using equa-

[11] The approximation stems from the assumption that distribution effects are unimportant. In the subsection that follows, we shall explain how these distribution effects may modify the conclusions drawn here.

tions (1)–(4) and (10), with $\hat{e}^e = 0$, it is possible to derive the following expressions for the equilibrium values of the real interest rates and the real exchange rate:[12]

$$dr = \frac{1}{2a_r}\{(1-c)d[(y^f + y^{f*}) - (g + g^*)] - d(\bar{a} + \bar{a}^*) - a_w d(B + B^*)\} + d\lambda \tag{11}$$

$$dr^* = dr - d\lambda \tag{12}$$

$$de = \frac{1}{2tb_e}\{[1 - c(1-2m)]d[(y^f - y^{f*}) - (g - g^*)] - (1-2m)[d(\bar{a} - \bar{a}^*) + a_r d\lambda + a_w d(B - B^*)] + 2(g_0 d\gamma - g_0^* d\gamma^*) + 2(d\overline{im} - d\overline{im}^*)\}. \tag{13}$$

In these expressions, $a_r$ and $a_w$ stand for the partial effects of changes in the real interest rate and wealth, respectively, on private sector absorption; $c$ is the marginal propensity to spend out of disposable income; and $m$ is the marginal propensity to import out of absorption.

Inspecting first the solution for the *real interest rates*, we note that what matters is world aggregate output and expenditures and not their composition between countries or between goods. The reason is simple. An increase in current output relative to current expenditures creates an excess supply of current output. To eliminate this excess supply, agents must be induced to consume more now. Hence, the relative price of current goods in terms of future goods must fall; that is, the real interest rate must fall.[13] Whether the change in output or expenditures originates

[12] Equation (11) is obtained by first adding equations (1) and (2) and noting that the trade balance (and hence the real exchange rate under the assumptions maintained in this subsection) disappears from the resultant expression. Using equations (3) and (4), one can solve this expression for the real interest rate. We also assume, for simplicity, that the government budget is kept balanced. For the sake of transparency it has been assumed that countries are symmetric in the sense that the partial differentials of the corresponding behavioral functions are the same. Relaxing this assumption would not change anything fundamental in the results; the main consequence would be that the simple averages of domestic and foreign variables that appear in the formulas would have to be replaced by weighted averages. But note that, for the assumption of equality of partial differentials to be reasonable, the countries must be approximately the same size. If they are not similar, behavioral parameters should be expressed in terms of elasticities. In this case, the solution for $r$ becomes

$$dr = \sigma d\lambda + (r_0/\eta a_0)\{(1-c)d[(y^f + y^{f*}) - (g + g^*)] - d(a + a^*) - a_w d(B + B^*)\}, \tag{11a}$$

where $\eta$ is the interest elasticity of absorption, $y^w = y^f + y^{f*}$, and $\sigma = y^{f*}/y^w$.

[13] As already noted, this explanation suggests that the time profile of an increase in output will be important in a more developed model. If, for instance,

only in one country or is concentrated more in one of the goods than the other does not matter, since it is the need to transfer purchases *between periods* and not between goods that gives rise to interest rate adjustments. Another way to see this point is to notice that policies of the pure expenditure-switching type have no impact on the real interest rate. Variations in $\gamma$, the proportion of government expenditures that is imported, or in $\overline{im}$, an exogenous component of imports,[14] both appear in the solution for the exchange rate but not in the solution for the interest rate. In contrast, expenditure-augmenting or expenditure-reducing policies—such as changes in government spending or in private autonomous expenditures—have a strong direct impact on interest rates. Finally, "talking down the dollar" by creating a risk premium on dollar assets increases the U.S. real interest rate, $r$, and decreases the foreign real interest rate by the same amount.[15] Total spending increases abroad and decreases at home.

In contrast to the interest rate, the real exchange rate responds to *differences* between countries in current spending and output. An increase in the output of the domestic good *relative* to the output of the foreign good must decrease the relative price of the former; that is, must increase the real exchange rate according to our definition. Similarly, an increase in domestic relative to foreign spending will appreciate the home currency in real terms if the marginal propensity to import is less than one half.[16] Such variations in spending may come about either by differential changes in government expenditures, $d(g - g^*)$, or in autonomous private spending, $d(\bar{a} - \bar{a}^*)$; by transfers of wealth between the countries, $d(B - B^*)$; or by the introduction of a risk premium on the foreign currency, $-d\lambda$.

Expenditure-switching policies have a direct impact on the real exchange rate. Changes in the composition of either government or private

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future as well as current output increased, the change in the excess supply of current *relative* to future goods, and hence the implication for the real interest rate, would depend on the relative sizes of the changes in output and on the discount rates of economic agents. See Frenkel and Razin (1986).

[14] Changes in $\overline{im}$ may be brought about by policies of "opening up" the economy to foreign products.

[15] That the change is by the same amount in both countries stems from the assumption of symmetry.

[16] This is a well-known result from the literature on the classical transfer problem. An increase in domestic spending by one unit increases the demand for the domestic good by $1 - m$. A decrease in spending abroad decreases the demand for the domestic good by $m^*$ units. The total effect on the demand for the domestic good is $1 - m - m^*$, which is positive if the marginal propensities to import are on average less than one half.

spending toward the import good will depreciate the home currency in real terms.

Having obtained solutions for $e$ and $r$, we are now in the position to derive an expression for the current account. Substituting from equations (11)–(13) into expression (7), one obtains, after some manipulation,

$$dca = \frac{1}{2}\{(1-c)d[(y^f - y^{f*}) - (g - g^*)] - d(\bar{a} - \bar{a}^*) - a_r d\lambda - a_w d(B - B^*)\} + r_0 d(b - B). \tag{14}$$

As in the case of the real exchange rate, we notice that the current account depends on *differences* between countries in output net of government expenditures $[(y^f - g) - (y^{f*} - g^*)]$, *differences* in autonomous spending, and so forth. In contrast to their influence on $E$, however, the explicitly expenditure-switching policies ($d\gamma$ and $d\overline{im}$) have no impact on the current account. From this result it follows that urging a country to open its markets to foreign goods (interpreted here as implying an increase in $\overline{im}^*$, the autonomous part of foreign imports) is an inefficient method of dealing with a current account problem under conditions of full employment.[17] In contrast, reducing domestic aggregate spending ($g$ or $a$) or increasing foreign aggregate spending ($g^*$ or $a^*$) will have strong effects on the current account. Introducing a wedge between domestic and foreign interest rates ($d\lambda > 0$) would also improve the current account because it increases $r$ and decreases $r^*$, thereby reducing domestic absorption and increasing foreign absorption.

The solutions for $r$ and $ca$ suggest an interesting issue of policy coordination in the event that we have two instruments, $g$ and $g^*$, and two targets, $r$ and $ca$. (We assume in this paragraph that $\lambda = 0$, so that $r = r^*$.) Clearly, with two independent instruments the two targets can, in principle, be reached. International policy coordination using $(g + g^*)$ to reach the interest target and $(g - g^*)$ to reach the current account target would be one possibility. Failing such cooperation, the correct pairing of national policy instruments and targets may be important for stability. For instance, it can be shown that under certain conditions the smaller country should target the current account and the larger country should target the world rate of interest.[18]

[17] This statement abstracts from the indirect effects of trade liberalization on the current account through the positive influence such liberalization has on economic efficiency and full-employment output. The size and sign of these indirect effects are ambiguous.

[18] For a proof of this assertion and a more detailed discussion of issues surrounding the policy mix and policy coordination, see our companion paper

## Extensions: Terms of Trade and Wealth Effects

The results obtained so far owe much of their simplicity to the explicit neglect of the effects of international income and wealth transfers brought about by changes in the interest rate and in the real exchange rate. In this section we consider briefly the sources and implications of these transfers.

Changes in the real exchange rate (that is, in the terms of trade in this model) may induce at least three distinct types of transfers. The first stems from the increase in real income (measured as output divided by the absorption deflator) experienced by the country whose output has increased in price. Thus, a real depreciation of the home currency reduces domestic real income and increases foreign real income. Although the consequences of this depreciation for interest rates are likely to be minimal, the current account of the home country is likely to improve as domestic absorption is reduced and foreign absorption is increased.

A second exchange-rate-induced transfer may result from international debtor or creditor positions. Suppose that the home country is a net debtor. An increase in the relative price of the foreign good (an increase in $e$) increases the real value of that debt measured in terms of either country's consumption basket.[19] Foreigners would be wealthier and would increase their absorption, whereas domestic residents would reduce theirs. The home country's current account balance would hence improve.

The last terms of trade effect we shall consider occurs if production levels depend on the relative price of the two goods.[20] An increase in $e$ would then increase foreign output and decrease domestic output, and one would expect a current account deterioration for the home country.

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(Genberg and Swoboda (1987)). That the relative size of countries should be important follows from the following solution for the influence of government spending on the current account, under the assumption that the interest *elasticities* of absorption—rather than $a_r$—are the same in the two countries:

$$dca = -(1-c)[\sigma dg - (1-\sigma)dg^*],$$

where, as in the preceding subsection, $\sigma$ is the relative size of the foreign country. We see that as the home country becomes small ($\sigma \to 1$), the current account effect of its fiscal policy increases relative to that of the foreign country.

[19] Remember that in our model the internationally traded asset is one that is expressed in terms of the domestic good. If the asset represented a claim on the foreign good, the transfer effects would obviously be reversed.

[20] This dependence of production on relative prices could, for example, come about either if the foreign good was used as an input in the domestic production process or if the supply of labor was elastic with respect to the real consumption wage ($W/P$).

Combining the above-mentioned three effects reveals that the induced effects of exchange rate changes are not unambiguous as far as the current account is concerned. The particular circumstance in which a country finds itself, as well as the size of parameters defining spending behavior, must be known before definite conclusions can be reached.

Changes in the rate of interest have one direct and one indirect effect on the current account that have not been considered so far. The direct effect is the obvious one that arises because of international debt service payments, whereas the indirect effect occurs because changes in interest income modify absorption in the two countries. As before, the net current account impact of the two effects is ambiguous. If the home country is a debtor, a higher interest rate will lead to greater debt service payments, but also to lower disposable income and to reduced absorption. The former worsens, while the latter tends to improve, the current account.

## III. Unemployment and Fixed Prices

We now turn from the case of fixed output and perfectly flexible prices to the opposite extreme of fixed prices and flexible output. The fixity of prices removes the dichotomy between real and nominal magnitudes, which will allow us to discuss the effects of monetary policy on both output and the current account. The responsiveness of output to aggregate demand fluctuations also renders expenditure-switching policies effective as an instrument of current account adjustment, contrary to the results in Section II. In the analysis that follows, we continue to assume static exchange rate expectations, and we abstract once again from the transfer effects discussed in the second subsection of Section II.

As before, it turns out to be useful to consider the determinants of the world interest rate in a first stage. This is because the assumption of perfect capital mobility makes it possible to treat the world as a closed-economy IS-LM system as far as real interest rate determination is concerned.

Adding equations (1) and (2) generates the world IS curve describing goods-market equilibrium in terms of the world rate of interest and world output. Similarly, adding equations (7) and (8) yields the world LM curve. Together, the two relationships can be solved for the interest rate $r^*$ (hence $r$, in view of $r = r^* + \lambda$) and world output ($y + y^*$). Note that neither equilibrium condition depends on the real exchange rate or any policy variables of the expenditure-switching type. This is again a reflection of the fact that the real interest rate reacts to excess demands

of *current* output relative to *future* output, irrespective of the commodity composition of these excess demands. The real exchange rate, in contrast, adjusts principally to changes in the *commodity structure* of excess demands.

Familiar propositions can be derived from this framework. Increases in government expenditures or in autonomous private expenditures raise the world interest rate and world output. Increases in the supply of money also expand output but lower the rate of interest. An increase in $\lambda$, the risk premium on domestic assets, leads to an increase in $r$, a decrease in $r^*$, but no change in $y + y^*$ because the contractionary effect at home is offset by expansion abroad.

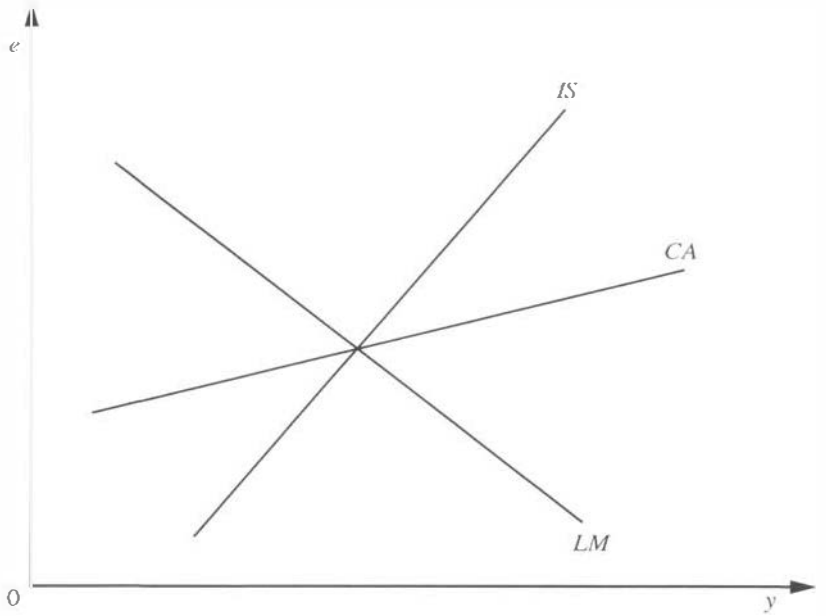
At this point it is useful to point out that the effect of, say, fiscal policy on the rate of interest is the same regardless of where it originates, provided that the size of the policy is measured in absolute terms. This is a consequence of fully integrated international capital markets and does not depend on the assumption of symmetry. If the size of a fiscal policy is measured as a fraction of gross national product, then its impact will vary proportionately with the relative size of the country. In the limiting case of a small domestic economy, the effect of changes in domestic variables becomes negligible, and the interest rate will be exogenously determined except for the risk premium. As we now turn to the solution for the exchange rate, the current account balance, and the distribution of output between countries, this small-country case will be dealt with first. Because all of the important results remain without significant modification in the two-country situation, the analytical simplicity introduced by the small-country assumption is particularly appealing.[21]

## The Small-Country Case

For a given foreign interest rate and a given level of foreign absorption, equations (1) and (7) define goods-market and money market equilibrium for the home economy. These are drawn in Figure 1 as the *IS* and *LM* curves, respectively. The *IS* curve is upward sloping because a real depreciation of the home currency (an increase in $e$) increases the demand for domestic goods and has to be accompanied by an increase in output for goods-market equilibrium to be maintained. In the money

[21] In addition to the simplified exposition afforded by the small-country case, it is introduced here in anticipation of the analysis of exchange rate, price level, and current account dynamics in Section IV, which becomes unmanageable in the full model.

Figure 1. *Equilibrium in Goods and Money Markets*

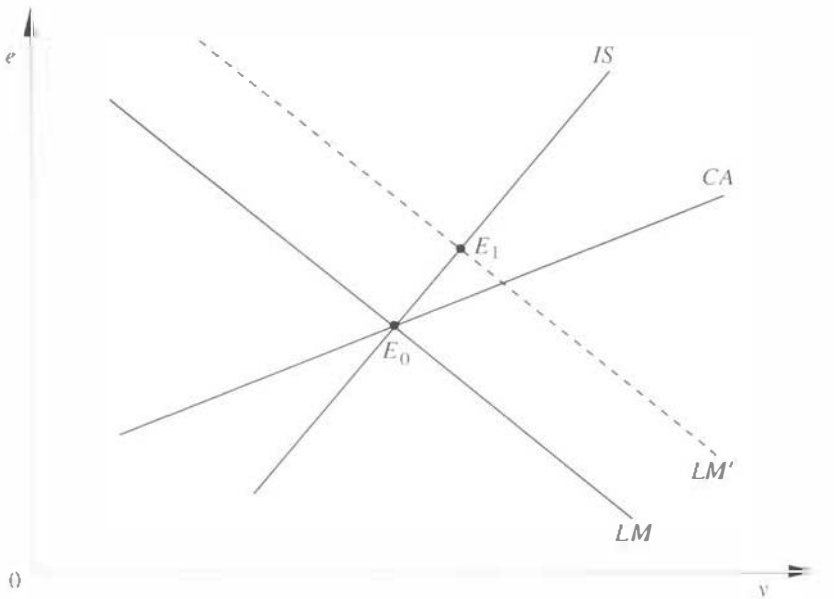



market, an increase in $e$ increases the domestic price level and reduces the real supply of money. Output must fall to maintain equilibrium, so the $LM$ curve is downward sloping.[22]

Current account equilibrium is maintained along the $CA$ schedule. A real depreciation leads to a surplus, which is offset by an increase in income. $CA$ is flatter than $IS$ because as output expands along $CA$ there will be an excess supply of domestic output that can only be removed by a further depreciation of the domestic currency. Points above $CA$ correspond to surpluses in the current account, points below to deficits.

[22]The size of the increase in the domestic price level is proportional to the weight of the import good in the domestic price index. Note that, although this model obviously belongs in the Mundell-Fleming tradition, it differs slightly from the standard formulation in that our $LM$ curve is downward sloping in the real-exchange-rate–output space, whereas in the traditional model it is vertical. The reason is that in the original version nominal money balances were deflated by the fixed price of domestic output rather than by the domestic price index, as done here. It would not be difficult to adjust our results to take into account this difference.

Figure 2. *Domestic Monetary Expansion*

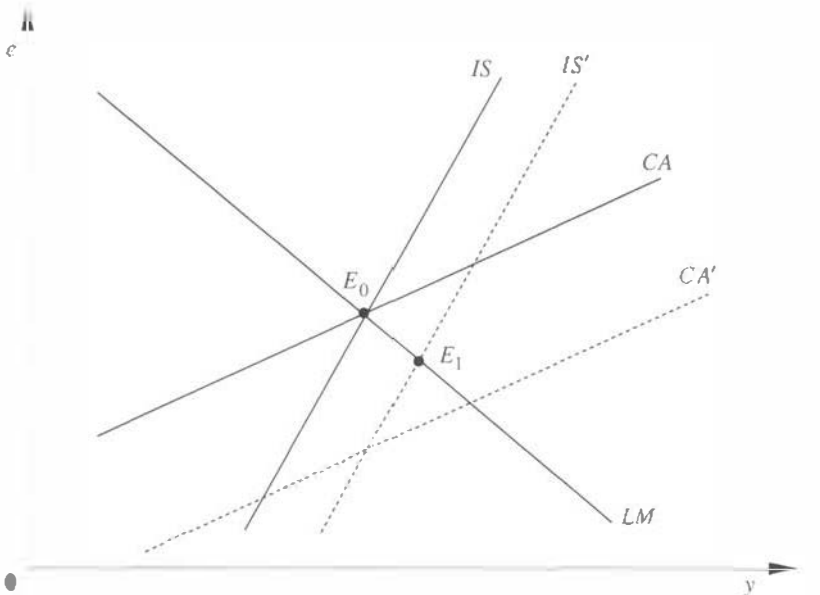



With the help of Figure 1 we can now study the exchange rate, current account, and output consequences of various disturbances. To save space we shall concentrate on those that generate different outcomes compared with the full-employment situation analyzed in Section II: a domestic monetary expansion and an example of an expenditure-switching policy.[23] The consequences of a change in λ will also be considered.

A domestic monetary expansion will shift the *LM* curve to the right (Figure 2); domestic output will increase, the currency will depreciate, and the current account will improve. A switch in demand from foreign goods toward domestic goods, owing to a change in the composition of government spending or to a commercial policy action, is depicted in Figure 3. The impact effect is a real appreciation, a current account surplus, and an expansion of domestic output.

[23]The effect of other disturbances, such as a fiscal expansion or changes in foreign monetary and fiscal policy, can easily be analyzed with the help of the diagram. As far as the current account and the real exchange rate are concerned, the results are very similar to those obtained in the case of flexible prices.

Figure 3. *Change in Composition of Government Expenditures*

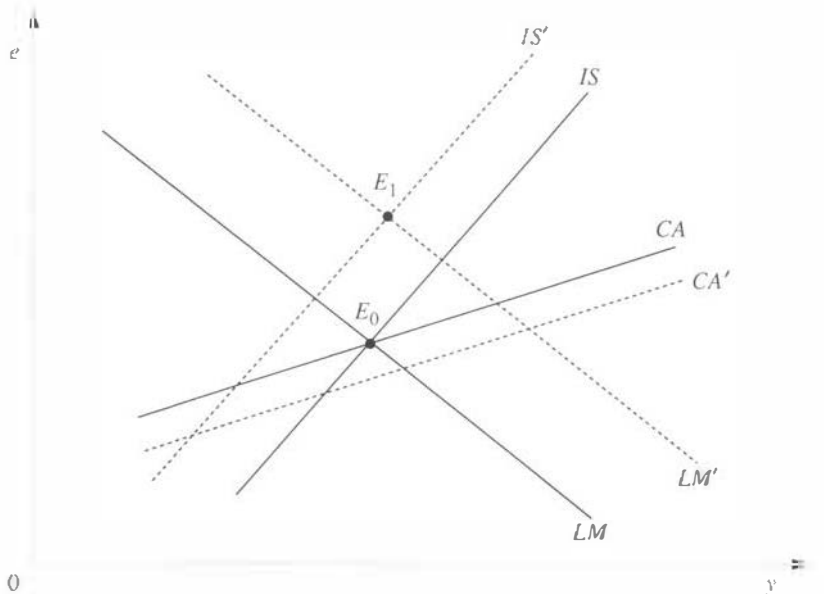



As these two examples illustrate—and contrary to the full-employment case—variable output renders effective for current account adjustment even policies that do not directly influence aggregate absorption. Monetary policy "works" because it brings about a real depreciation of the domestic currency that in turn switches expenditures toward the domestic good. Domestic output then expands and makes room for a current account improvement. Policies that explicitly alter the commodity composition of demand operate through the same channel.

An increase in λ (Figure 4), finally, increases $r$ because $r^*$ is fixed by the small-country assumption. As a consequence, the demand for money falls and *LM* shifts to the right. The increase in $r$ also reduces the demand for domestic output and shifts *IS* to the left, while *CA* is displaced to the right as absorption diminishes. Short-run equilibrium implies a depreciation of the home currency, an increase in output, and a current account surplus.

Before turning to the two-country case, it is useful to compare the relative effectiveness of monetary and fiscal policy for current account and domestic income adjustment in the present context, where both

Figure 4. *Change in Risk Premium on Domestic Assets, λ*




policies have a nonnegligible impact on these variables. The reason for our interest in this issue derives from the literature on the assignment problem and Mundell's principle of effective market classification. According to that principle, a policy instrument must be assigned to the target upon which it has the largest relative influence in order to ensure convergence toward optimal instrument setting when there is limited information about the exact structure of the economy. We have shown elsewhere (Genberg and Swoboda (1987)) that, in the context of the original Mundell-Fleming model, the proper assignment *under flexible exchange rates* is for fiscal policy to look after external balance (the current account) and for monetary policy to ensure internal balance (full employment or price stability). The reason for this assignment rule is that fiscal policy has a relatively stronger impact on the current account compared with monetary policy. Because the Mundell-Fleming model contains some rather restrictive assumptions (notably, that the price of domestic output is fixed and that money market equilibrium is independent of the exchange rate), it is of interest to know if this assignment

is also valid under more general conditions. The answer, in short, is yes. Fiscal policy has a comparative advantage with respect to current account adjustment if the expression

$$R = \left[\frac{\frac{dca}{dg}}{\frac{dy}{dg}}\right] - \left[\frac{\frac{dca}{dM}}{\frac{dy}{dM}}\right]$$

is positive. It can be verified that, in the model used in this section, this is indeed the case.[24] Furthermore, incorporating in the model an aggregate supply structure based on a labor market in which there is some degree of wage indexation (as in Sachs (1980)) does not alter this result. Fiscal policy should still be assigned to the external balance target whether nominal wages are completely rigid or completely indexed to the domestic consumer price index. Finally, the result does not depend critically on the assumption of static expectations. Introducing forward-looking expectations (as in the second subsection of Section IV) does not alter the assignment rule if relative-price elasticities of export and import demand functions are sufficiently large, and if the steady-state effect of a fiscal expansion that falls on the domestic good is to increase its relative price.

## The Two-Country Case

Solving for the real exchange rate and the current account in the two-country case is slightly more complicated for fixed prices than it is for flexible prices, in view of the interaction between the money and goods markets. The mathematical analysis, however, results in solutions that look very similar. As before, the exchange rate and the current account depend on *differences* between the policy instruments in the two countries. In addition, the qualitative effects of fiscal policy, autonomous changes in private sector spending, changes in the risk premium, and wealth transfers are the same as in the full-employment case. Expenditure-switching policies also have the expected influence on the real exchange rate. What is really new in the fixed-price environment is that monetary policy now influences both the real exchange rate and the current account and that expenditure-switching policies may influence the current account. Both types of influence go in the direction that the small-country analysis should lead us to expect. A monetary expansion

[24]The computations can be obtained from the authors on request.

leads to a depreciation of the currency and to an improvement of the current account. Switching expenditure patterns toward the import good also depreciates the currency but deteriorates the current account.[25] Furthermore, domestic output will fall and foreign output will increase, indicating that restricting trade can be used as a beggar-thy-neighbor policy.

## IV. Steady State and Dynamics of Adjustment

Until now the analysis has proceeded on the assumption that the distribution of asset stocks between countries is given. But current account imbalances do, of course, imply capital transfers. Over time these transfers will alter the relative wealth positions of the two countries and, hence, the composition of world spending. Adjustment in the exchange rate will have to take place. Changes in wealth and disposable income (as a result of changes in debt service payments) also alter the relative levels of absorption between countries and, hence, the current account balance. Eventually this adjustment mechanism will bring about a steady-state equilibrium characterized by a balanced current account and constant values of all other endogenous variables. In the second subsection we shall investigate the difference between this equilibrium and the short-run equilibria discussed in Sections II and III, especially with respect to the implied values for the real exchange rate. It will be shown that, in some important cases, the impact and steady-state responses of the exchange rate to exogenous disturbances will be substantially different.

In the second subsection we also discuss briefly other sources of dynamics resulting from exchange rate expectations on the one hand and from price level dynamics on the other. The purpose of doing so is, in the former case, to illustrate how the short-run results may be influenced and modified by the long-run properties of the model and by expectations of future policy actions, and, in the latter case, to provide a link between the results under flexible prices in Section II and under fixed prices in Section III.

[25] Note that, for the last two disturbances, the home currency depreciates in real terms. The current account, however, improves in one case and deteriorates in the other. Thus, the correlation between $e$ and $ca$ can be positive or negative depending on the sources of the disturbances.

## Steady-State Equilibrium

Reconsider the effects of a domestic fiscal expansion. We have already shown that such a policy leads, on impact, to a real appreciation of the domestic currency and to a current account deficit. As a result of financing this deficit, there will be a transfer of assets abroad. Domestic wealth decreases, as does disposable income.[26] Because the opposite changes are taking place in the foreign country, domestic absorption will fall, and foreign absorption will increase. The deficit in the current account will thus diminish over time, and the home currency will start to depreciate. This process of adjustment will continue until the current account is back in balance. At this stage, the trade account must be in surplus to finance the deficit on the debt service account. The real exchange rate has depreciated relative to the impact equilibrium and may even have depreciated relative to the initial equilibrium.[27]

A similar analysis of government spending can be carried out for changes in private sector absorption, $a$ or $a^*$; changes in the risk premium on domestic assets, $\lambda$; and changes in the outstanding stocks of government bonds, $B$ or $B^*$. It can be shown that, in each of these cases, the steady-state response of the real exchange rate is the opposite of the short-run response.[28] This result suggests that in any interpretation of historical movements in real exchange rates it is crucial to take into account the dynamic influences brought about by current account adjustments. Otherwise, seemingly unexplainable exchange rate paths would be unaccounted for. As an example, one might mention the appreciation of the U.S. dollar in the early 1980s, which was followed by the depreciation that started in the first quarter of 1985. It has been suggested that an explanation of the appreciation that emphasizes the expansionary fiscal policy in the United States relative to the rest of the world in the

[26] Disposable income falls as a result of the increased debt service payments brought about by the emerging net debtor position of the home country.

[27] The outcome is ambiguous. The reason is that the increase in government spending not only increases aggregate spending in the home country but also switches expenditures toward the domestic good. This tends to increase its relative price; that is, to *appreciate* the domestic currency in real terms. The redistribution of income and wealth toward foreigners as a result of current account financing increases foreign spending and switches world demand toward the foreign good. This tends to *depreciate* the domestic currency. Which of the two effects dominates cannot be determined a priori. For a more detailed discussion of these issues, see Genberg and Kierzkowski (1979) and Sachs and Wyplosz (1984).

[28] Details are provided in the mathematical appendix, available on request.

early 1980s cannot explain the depreciation after 1985, since there was no drastic change in relative fiscal policies about that time. Hence, the argument continues, the fiscal policy explanation is unconvincing. Without wanting to suggest that only fiscal policy mattered in this episode, it is of interest that the general shape of the dollar's movement corresponds with the dynamic response to a fiscal expansion that our analytical model implies.[29] The model also predicts that the current account of the United States should have improved. That it has not yet done so suggests that elements other than the working out of the effects of previous fiscal impulses are at work, or that the dynamic adjustment path is more complicated than in our stylized theoretical model.

## Exchange Rate Expectations and Price-Level Dynamics

The assumption of static expectations that we have adopted in the foregoing analysis is a convenient analytical simplification, but it hides some potentially important and interesting effects of policy changes. To illustrate these, suppose we make the alternative assumption that agents form their expectations on the basis of the difference between the long-run (steady-state) value of the exchange rate and the current value, in the manner formulated in Dornbusch (1976):

$$\hat{e}^{e} = \theta(\bar{e} - e). \tag{15}$$

Inserting equation (15) into the real interest parity equation yields

$$r = r^{*} + (\alpha - \alpha^{*})\theta(\bar{e} - e) + \lambda. \tag{16}$$

From equation (16) it is immediately clear that events that are anticipated to take place in the future will (through $\bar{e}$) have an immediate effect on interest rates and, hence, on the current equilibrium of the economy. Two illustrations of this relationship will be given shortly.

Equation (16) also suggests another way in which to model the idea that policymakers can influence the value of a currency without under-

[29] Extending this framework to incorporate imperfect substitutability between domestic and foreign assets provides another reason for the turnaround of the dollar given an unchanged fiscal deficit. If the risk premium $\lambda$ is a positive function of the supply of U.S. government debt, then a continuous budget deficit in the United States will lead to increases in $\lambda$ over time. As we have seen, this will lead to a depreciation of the home currency in the model. Furthermore, if government debt is considered to be at least in part net wealth, and if wealth has a positive impact on spending, the budget deficits will tend to increase private sector absorption and delay the improvement in the U.S. current account. For a further analysis, including supporting empirical evidence, see Morris (1988).

taking any concrete policy changes (again, the "talking down the dollar" idea). Suppose the authorities could, by the appropriate statements, convince the public that $\bar{e}$ is different from what they previously estimated it to be. Let the initial estimate be $\bar{e}_0$ and the modified one $\bar{e}_0 + d\bar{e}$. Introducing these terms into equation (16) gives

$$r = r^* + (\alpha - \alpha^*)\theta(\bar{e}_0 - e) + \lambda + (\alpha - \alpha^*)\theta d\bar{e}, \tag{17}$$

which shows that influencing expectations directly in the manner introduced here amounts, for analytical purposes, to the same thing as introducing the risk premium $\lambda$. Our previous analysis of this case thus carries over to the present formulation.

To show the consequences of introducing expectations as in equation (15) into our model, consider again the small-country version discussed in the first subsection of Section III above and the effect of a domestic fiscal expansion.[30] With static expectations, the impact effect is to move the economy from $E_0$ to $E_1$ in Figure 5. Now we assume that agents react to the fact that the steady-state value of the real exchange rate has changed. To be specific, suppose $\bar{e}$ has fallen. In this case, the *LM* curve must shift downward to *LM'*.[31] As a result, the effects of the fiscal expansion are a larger appreciation of the domestic currency and a smaller change in output (point $E_2$). Expectations of future exchange rate adjustments have thus modified the nature of the short-run equilibrium.

If we allow for the current account mechanism described in the previous section and a gradual adjustment of prices in response to the relationship between current output and full-employment output, the economy would move over time along a path from $E_2$ to $\bar{E}$, experiencing in the process a buildup of foreign debt, increasing prices, and an improving current account balance.

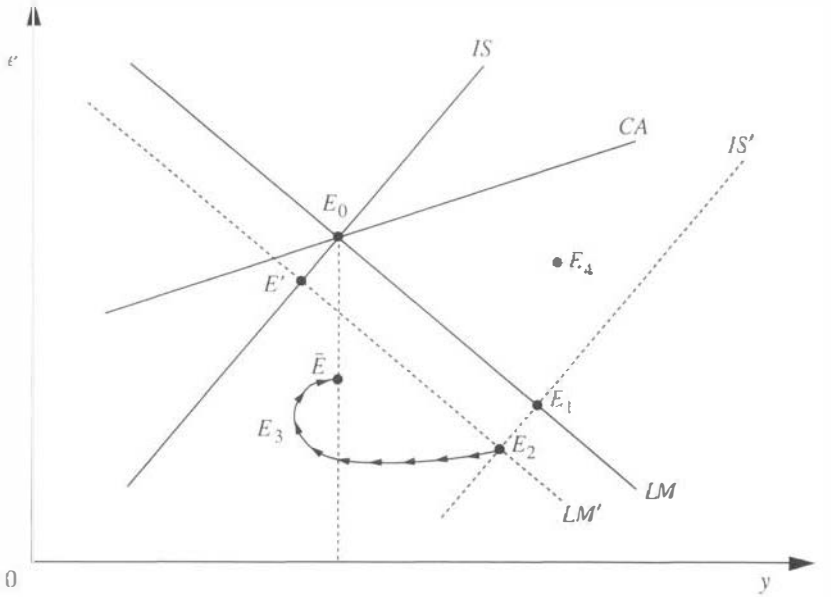
Consider now an expected *future* fiscal expansion. Before the government expenditures actually increase, the only effect on the economy is that which comes from the influence of a change in $\bar{e}$ on expectations. As before, the *LM* curve shifts immediately, and we get a temporary equilibrium at a point such as $E'$ in Figure 5.[32] The mere expectation of a

[30] The discussion that follows draws heavily on Camen and Genberg (1987).

[31] The reason is that a fall in $\bar{e}$ relative to $e$ reduces the domestic interest rate according to equation (16). For a given money supply and at the original level of output, this effect creates an excess demand for money that must result in a decrease in $e$, which is to say that the *LM* curve shifts downward.

[32] In this diagram we have not taken into account the effect of changes in $\bar{e}$ on the *IS* curve. Doing so would complicate Figure 5 but would not alter any of the points that we wish to make here. See Camen and Genberg (1987) for a fuller discussion.

Figure 5. *Fiscal Expansion/Contraction Under Exchange Rate Expectations*




fiscal expansion thus appreciates the currency, creates a current account deficit, and reduces output. When the actual expansion takes place, the economy first moves to a point such as $E_2$ and then, over time, to the steady-state equilibrium at $\bar{E}$.

It has been suggested (see Branson (1985)) that the anticipation of fiscal policy changes may have significantly influenced movements of the dollar in the early 1980s. The analysis in the previous paragraph illustrates a possible mechanism through which such anticipation may have operated and suggests that forward-looking expectations may be of substantial importance for the short-run dynamics of the exchange rate and the current account.

Finally, let us illustrate the influence of expectation effects by analyzing a successful attempt to depreciate the home currency by, say, convincing the public that fiscal policy will be tightened in the future, thus inducing the populace to revise upward its estimate of the steady-state value of $e$. Suppose further that the announcement was made when the economy was at point $E_3$ on the adjustment path from $E_2$ to $\bar{E}$ in Fig-

ure 5. In the diagram the reaction to the announcement would be to increase domestic output (in a two-country setting, at the expense of foreign output), improve the current account, and depreciate the currency as the economy jumps to a point such as $E_4$. The gain would be partially reversed in the future as the announcement effect wears off and as the dynamics of the current account and price level take over. The steady-state equilibrium would still be at $\bar{E}$.

## V. Implications for Current Policy Controversies

We conclude this overview of current account determination and the role of government policy by relating some of our major results both to general issues about the reform of the international monetary system and to specific controversies about policies to deal with current account imbalances in the United States, on the one hand, and the Federal Republic of Germany and Japan, on the other.

In our analysis we have emphasized repeatedly the need to focus policy discussions on the appropriate setting of policy *instruments* and not on the values of endogenous variables that may have the character of an intermediate target. Hence, one should not ask what value of the dollar is appropriate in light of such a goal, but rather what are the most effective tools for reaching the adopted targets and what are suitable values for the implied policy instruments.

An implication of this general proposition is that attempts to manipulate exchange rates by relying on expectation effects of policy announcements are undesirable. Although such announcements may have some desired effects in the specific circumstances, these are bound to be short lived. In the medium run to long run, there is no substitute for genuine policy adjustments, and announcements that are not adhered to may well undermine confidence and stability. Similarly, we would argue that commercial policy should not be used to attain output or current account targets. The reason is that commercial policy will have only a temporary effect on output and the current account. As this effect disappears in the longer run, the commercial policy initiative may be judged a failure.[33] Thus, although it is clearly desirable that countries should open their markets to foreign goods and not discriminate in favor of domestic production, we would argue that the case for trade liberalization should be made on its own merits and not as a tool for current account adjust-

[33] Recall that in Section II we showed that expenditure-switching policies do not influence the current account in a full-employment context.

ment or employment creation, lest such arguments be used in other circumstances to restrict trade.

A second implication is that proposals to establish target zones for real exchange rates in order to limit currency misalignments and current account imbalances cannot be designed without taking into account other major elements of government policy. As we have emphasized throughout, fiscal policy has a significant impact on both the current account and the real exchange rate of a country. Agreement on "appropriate" values of exchange rates hence implies agreement on the appropriate stance of fiscal policy.

At a more specific level, our results agree with what has now become a commonplace conclusion: to the extent that existing current account disequilibria are to a significant measure due to international imbalances in fiscal policy, *the appropriate response is to redress these imbalances.* Our analysis has taken us a bit further, however, in that we have also stressed the importance of aggregate world fiscal policy for real interest rate movements. If world interest rates are not judged to be too low at present, current account adjustment should not be achieved with increases in government spending in Japan and Germany without corresponding reductions in government spending in the United States. If credible commitments could be made that fiscal consolidation would be forthcoming, a case could perhaps be made on grounds of aggregate demand that policies should err on the side of expansion at present. But, since such commitments have been made and broken in the past, the desirable expansionary effects may not materialize.

Our analysis also implies that it is quite unlikely that long-lasting current account imbalances are due to commercial policy practices. Such policies are of the expenditure-switching type that were shown to influence relative prices but not the current account. It follows that remedies to existing trade imbalances are not to be found in such policies either. Their main long-term effect would be a reduction in the overall volume of international trade and, hence, in the benefits that countries derive from such trade.

Finally, we re-emphasize the importance of adopting a dynamic and somewhat longer-run perspective than is typically done when one tries to interpret current account and exchange rate movements. We have shown how current account evolution implies quite different short-run and long-run responses to a given policy. Trying to decide whether an economy is on the "right" path or whether its currency or international trade position is out of line with the "fundamentals" is thus a very delicate and difficult task. A good dose of modesty is definitely called for. Stressing

a few basic points, as we have tried to do in this paper, and adopting a longer-run horizon for the evaluation of policy would seem prudent.

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