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THE ROLE OF THE CURRENT ACCOUNT IN EXCHANGE RATE DETERMINATION:
A COMMENT ON RODRIGUEZ

by

Michael P. Dooley and Peter Isard

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Michael P. Dooley*
and Peter Isard

The Role of the Current Account in Exchange Rate Determination:

A Comment on Rodriguez

In a recent contribution to the JPE, Rodriguez (1980) analyses the role of trade flows in exchange rate determination based on a rational expectations formulation of the portfolio balance framework. The purpose of this comment is to extend the Rodriguez analysis by relaxing the restrictive assumption that domestic holdings of foreign currency can only accumulate or decumulate through trade surpluses or deficits, or more generally, through current account imbalances. We derive a modified version of the Rodriguez solution form using assumptions that better reflect the high degree of development of international credit markets, under which current account imbalances transfer wealth between domestic and foreign portfolios but may have little to do with changing the stocks and currency mix of the (outside) assets that public sectors impose (at market clearing prices) upon private portfolios. In addition, we interpret a key parameter in the Rodriguez solution form which raises an important issue about the role of the current account in the limiting case of perfect asset substitutability.

*/ Board of Governors of the Federal Reserve System. The first author is on leave at the International Monetary Fund. This paper represents the views of the authors and should not be interpreted as reflecting the views of the Board of Governors of the Federal Reserve System, the International Monetary Fund, or other members of their staffs.

Our extension of the Rodriguez model focusses on the monetary bases (MB, MB*) and the stocks of outside interest-bearing bonds (B, B*), denominated in domestic and foreign currencies. Private domestic and foreign residents hold money-plus-bond portfolios of size W_D and W_F , which we refer to as "wealth" levels.^{1/} It is assumed that MB and MB* are entirely held, respectively, in domestic and foreign portfolios. R and R* denote own rates of interest on domestic and foreign bonds. S, F and S^e denote the spot, forward and expected future spot exchange rates, as domestic currency prices of one unit of foreign currency.

By combining market clearing conditions and portfolio demand assumptions we can analyze the relative yields on assets that are expected under conditions of portfolio balance.^{2/} The market-clearing condition for foreign bonds can be expressed as:

$$(1) \quad SB^* = x_D(W_D - MB) + x_F S(W_F - MB^*)$$

where x_D and x_F denote the shares of their bond portfolios that domestic and foreign residents choose to hold as foreign bonds. These portfolio shares are assumed to reflect constant elasticities of demand with respect to the ratio of the expected future prices of foreign and domestic bonds (per unit of domestic currency invested).

^{1/} We assume that current account imbalances are settled by payments in money or bonds (direct international equity investments are suppressed), and that public budget deficits are financed with money or bond issues. Beyond this, our conclusions are not affected by ignoring the equity and future-tax-liability components of financial wealth.

^{2/} We have previously analyzed this framework in Dooley and Isard (1979 a and b).

$$(2) \quad x_D = \alpha_D \sigma^\beta$$

$$(3) \quad x_F = \alpha_F \sigma^\beta$$

where

$$(4) \quad \sigma = [(1/S)(1+R^*)S^e]/(1+R)$$

Under the condition of covered interest rate parity

$$(5) \quad S = F (1+R^*)/(1+R)$$

The expected future price ratio is seen to represent the ratio of the expected future spot rate to the forward rate.

$$(6) \quad \sigma = S^e/F$$

It is common to refer to σ as the exchange risk factor, or 1 plus the premium for bearing exchange risk, or (as an approximation) 1 plus the expected differential yield in favor of foreign bond holdings.

As a notational convenience, denote the global size of bond portfolios as

$$(7) \quad W = (W_D - MB) + S (W_F - MB^*)$$

and denote the division of the global portfolio, by ownership, as

$$(8) \quad w_D = (W_D - MB)/W$$

$$(9) \quad w_F = S(W_F - MB^*)/W$$

Conditions (1)-(3) and (8)-(9) accordingly combine into

$$(10) \quad S = G\sigma^\beta$$

where

$$(11) \quad G = (\alpha_D w_D + \alpha_F w_F)W/B^*$$

We focus on the logarithmic form of (10) using an approximation, based on (4), that the logarithm of σ equals the interest differential plus the expected change in the logarithm of the exchange rate. Thus, the logarithmic form of (10), evaluated at time t , can be expressed as

$$(12) \quad s(t) = g(t) + \beta [s(t+1) - s(t) + R^*(t) - R(t)]$$

where $s = \log S$, $g = \log G$, the interest rates apply to the holding period between t and $t+1$, and variables with time arguments beyond t --in particular, $s(t+1)$ --are understood to represent expectations held at time t . It is readily seen that β corresponds to the reciprocal of Rodriguez's "b" parameter and that the continuous time version of (12) is analogous to Rodriguez's condition (7) with the solution form 1/

$$(13) \quad s(t) = s(t+T)e^{-T/\beta} + \int_0^T [R^*(t+\tau) - R(t+\tau) + (1/\beta)g(t+\tau)] e^{-\tau/\beta} d\tau$$

Note that conditions (2) and (3) provide an economic interpretation of β -- namely the elasticity of demand with respect to the expected relative price of bonds denominated in different currencies.

The thrust of the Rodriguez model is that the current account influences the exchange rate through wealth and portfolio balance effects. Our extension of the Rodriguez framework refines and qualifies this conclusion by recognizing that with highly developed international credit markets, current account imbalances can be settled via transfers of claims denominated in either the domestic or the foreign currency unit. Under the assumption that the global stocks and currency mix of public debts are independent of the current account, condition (11) captures the influence of the current account on G via its role in transferring wealth between domestic and foreign residents (reflecting its equal and opposite effects on w_D and w_F), and in condition (13) the effects on $g = \log G$ feed through to the exchange rate. An important refinement of the Rodriguez result, however, is that the effects of the current account on the exchange rate depend on differences in the portfolio preferences of domestic and foreign residents.

1/ The solution form abstracts from the valuation effects of the exchange rate on g via the wealth variables w_D , w_F and W .

In the limiting case of identical preferences ($\alpha_D = \alpha_F$), G is independent of the distribution of private wealth between domestic and foreign residents, and hence the current account has no wealth or portfolio balance effects on the exchange rate.

The evaluation of the role played by the current account in exchange rate determination can be further extended by considering the limiting case of perfect asset substitutability. In this case $\beta = \infty$, the solution form reduces to a condition of open interest rate parity and the current account has no wealth or portfolio balance effects on the exchange rate. It is noteworthy that in this case the rational expectations solution cannot close the model since the coefficient on the expected future exchange rate does not have a limiting value of zero.

The fact that the portfolio-balance framework, as traditionally modeled, does not provide a role for the current account under neutrality toward exchange risk is a serious and unnecessary limitation. One of the oldest conjectures in international economics is that residents of one country will not willingly lend forever to residents of another due to political or default risk. A portfolio balance framework in which claims on non-residents are assumed to be imperfect substitutes for claims on residents, even when the currency denomination of such claims is identical, would represent a sensible extension of the framework developed in this note. Such a framework would retain portfolio considerations as central to the explanation for why exchange market pressures arise in response to unexpected current account imbalances, even for countries that denominate their debt to nonresidents in foreign currencies. 1/

1/ Dooley and Isard (1979b), Hooper and Morton (1980) and Mussa (1980) discuss the influence of the current account on expected future exchange rates but do not explicitly link the influence to political risk.

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