THE PORTFOLIO-BALANCE APPROACH TO PAYMENTS-ADJUSTMENT THEORY: A SURVEY OF LITERATURE

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Introduction

The theories explaining the mechanism of international payments adjustment can be categorized chronologically as those emphasizing relative price changes, relative income changes, and relative asset-position changes. The first category of theories is associated with the "elasticities" approach with its lineage from Marshall to Machlup. The most forceful proponent of the theory belonging to the second category was Alexander, who is associated with the "absorption" approach. Before it was recognized that "elasticity" and "absorption" approaches emphasize different facets of the same problem, the controversy between the advocates of the two approaches, as exemplified by Machlup (18, 1955 and 19, 1956) and Alexander (1, 1959), was quite reminiscent of the controversy of the late twenties between Keynes (13, 1950) and Ohlin (26, 1950) over whether prices or incomes adjustment is of crucial importance in solving "the transfer problem." Since it was impossible to ignore obvious merits of each rival theory, at the same time as the controversy raged, the participants hurried to point out that these obvious merits are nothing else but self-evident truths. Alexander conceeded that relative price changes do play a role in the adjustment process, while economists prominently associated with the "elasticities" approach, like Machlup and Meltzer, not only admitted but stressed the role played in the adjustment process by changes in income and expenditure.

Even if one admits that both changes in the terms of trade and changes in income and expenditure are complementary factors in adjustment of a country's payments position, one has to specify what are the accompanying changes in monetary aggregates, mainly in the supply of money. Without this specification, it was generally admitted, no conclusion could be reached as to either the change in the price ratio between traded and non-traded goods

or the change in the domestic money income or expenditure. Tsiang (31, 1969) tackled the problem of showing how terms of trade and income-expenditure changes interact under various monetary-policy assumptions to determine the success or failure of the adjustment process initiated by a devaluation. Tsiang was primarily concerned with the problem of stability in the foreign-exchange market. His main contribution seems to be, however, the construction of a model allowing for both relative prices and income-expenditure variations in a framework which incorporates both real and monetary sectors. Both the "elasticities" and "absorption" approaches, as well as Tsiang's synthesized formulation, equated balance of trade to the balance of payments; they concentrated uniquely on the adjustment of trade flows and remained conspicuously oblivious to the role of capital movements, either autonomous or induced, in the adjustment process.

Capital Mobility and Optimal Policy Mix

Even before Tsiang's attempt to settle the dispute between the proponents of "elasticities" and "absorption" approaches, the latter produced a "windfall gain" in the form of several contributions, which in retrospect can be viewed as building blocks for the "portfolio-balance" or "portfolio-equilibrium" approach. In his classic article, Johnson (21, 1969), while emphasizing the predominance of monetary factors, set out to distinguish between stock adjustments and flow adjustments. In the context of the balance of payments, a stock deficit is due to asset substitution with a country's total stock of assets unchanged while a flow deficit is associated with excessive absorption as compared to current output and therefore results in a deterioration of a country's capital position. Kemp (as reported by Anne Kruger (16, 1969) formulated a stock-adjustment model in which adjustment is achieved by redirecting flows of current consump-

tion money toward accumulation of stocks of nominal assets in the deficit country, and in the opposite direction in the surplus country. Equilibrium is achieved when actual stocks equal desired stocks, i.e., when portfolio balance is reached. If, therefore, the desired stock is finite, the stock deficit is necessarily temporary. A flow deficit, however, can continue in principle indefinitely, or at least as long as it is matched by a decumulation of assets. This possibility led Mundell to investigate the anatomy of a policy mix which would bring about the attainment of domestic goals simultaneously with insuring an external balance of the described sort, i.e., characterized by mutually offsetting trade and capital flows. Mundell developed his principle of effective market classification while he worked at the IMF on the problem of whether monetary or fiscal policy should be used for internal or external balance. However, his work (23, 1968) has had a tremendous influence also in other areas of the theory of international finance.

Initially, Mundell used the Keynesian concept of monetary policy as involving the interest rate. Instead, however, of keeping the interest rate constant, he took it as an instrument of monetary policy designed to encourage or discourage the inflow or outflow of capital. (In such a formulation, the money supply has to be adjusted so as to make the chosen interest rate effective in the market). In order for such a monetary policy to have an effect on the balance of payments, capital has to be mobile internationally. Now, if the capital is perfectly mobile, interest rate policy has no meaning: the central bank cannot control the stock of money. Since the country cannot fix the interest rate or determine the stock of money, (under a system of fixed exchange rates), monetary policy, however defined, has no effect at all on internal

balance. Consequently, it is the fiscal policy which must be assigned to restore (or maintain) the internal balance.

The Monetary Approach

In 1960, this assignment problem was Mundell's major concern. (Later, in 1962, in order to get rid of logical ambiguities, he redefined monetary policy, when capital is perfectly mobile, as changes in the portfolio of the central bank). But one outgrowth of this formulation was a body of literature on balance-of-payments adjustment representing a view which is labeled nowadays "the monetary approach." As expounded by Komiya (14, 1969) and elaborated by Harry Johnson (11, 1972), Mundell (24, 1971), Berglas (2, 1974), Dornbusch (6, 1973), and others, it can be summarized as follows. The approach is essentially an extension of the basic proposition stated above that an open economy cannot control its nominal money stock. That stock is determined by demand and any credit policy by the central bank having as its aim to influence the money supply will simply give rise to offsetting flows of foreign-exchange reserves. Hence, the balance of payments represents the difference between desired additions to the money stock and the creation of domestic credit. The most the monetary authorities can do is to determine the division of the money supply between money supply between two sources, domestic assets and international assets.

It is a corollary of this view of the balance of payments to make a distinction between the monetary variable - the rate of exchange (price of foreign currency in terms of domestic currency), and the real variable - the terms of trade (average price of export goods in terms of import goods)* It follows

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* In the case of large Mundellian Optimum Currency Areas the exchange rate and the terms of trade are synonymous since the monetary authority of each area acts to stabilize the price of its good in terms of its own currency. On the other extreme is a "small country", a Johnsonian (continued on next page)

that, in absence of offsetting capital flows, it is the terms of trade which must adjust to correct a trade imbalance at current expenditure levels. In the short-run, however the level of expenditures does not have to stay unchanged. If a trade deficit prompts a devaluation of a country's currency, and if this devaluation brings about an increase in the level of prices, then the real money balances that the community holds will be reduced. With no change in the rate of credit expansion there will be a temporary curtailment of expenditures, needed to replenish the stock of real cash balances, which will result in a surplus in the balance of trade. The trade surplus so generated is inherently of a short-run nature. In the long run, according to this theory, the exchange rate is neutral in the sense that anything that can be accomplished via changes in exchange rates can also be accomplished by means of other domestic policies. Of course, the core of this theory of the exchange rate is that manipulation of the rate is not neutral in the short-run: exchange-rate changes, say devaluation, are equivalent to a tax on holders of asset denominated in domestic currency and to a transfer to holders of assets denominated in foreigh currency. Thus a devaluation gives rise to portfolio disequilibrium, which in turn elicits changes in the flow of goods and services. The increment to this flow, the temporary surplus, disappears when portfolios have been balanced. The time path of the balance-of-payments adjustment will depend, in addition to the strength of initial disturbance, on the speed with which people wish to restore the real value of their portfolios.

Portfolio-Balance Models

The account above, centered on exchange-rate changes as the policy instrument, disregarded the possibility of capital movements and ignored the

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* (cont'd.) "banana republic," where the terms of trade are exogenously fixed in world markets so that a change in the exchange rate will be effective in restoring external balance to the extent that it will bring about a change in domestic absorption.

existence of assets other than money. It is obvious, however, that interaction between demands for cash balances and bonds can be introduced in a manner suggested by Patinkin (27, 1965) by making these bonds internationally tradable. In addition, if one defines the stock of real cash balances, m, as $m = \frac{M}{eP}$, where M is the nominal quantity of money, e is the rate of exchange, P is the world's price level exogenously given, then changes in M are exact opposites of changes in e, (assuming all demands are homogeneous of degree zero in M and e). It follows that a reduction in the nominal supply of money is analogous to a devaluation. This reduction (or increase) in M can be achieved by either monetary or fiscal policy and the results for the balance-of-payments adjustment, the level of reserves, capital flows, income and the interest rate will be generally different in each case. Moreover, they will be different depending on what one assumes about the degree of mobility of capital and the exchange-rate regime.

One of the pioneers of the portfolio-balance approach, McKinnon (20, 1969) frustrated by the analysis of adjustment within the standard Keynesian model, which "stresses the importance of income flows, and de-emphasizes the importance of balance-sheet considerations," set out to construct a model incorporating the former as well as the latter. McKinnon reconstructed the Keynesian model in which he explicitly incorporated the equations for the commodities, money, and bonds, (all of them depending on income and the arte of interest only) along with an equation for the flow demand for commodities which in addition to usual arguments - income and the rate of interest - contains elements of wealth: money, bonds, and real assets. Because of this set-up, in McKinnon's portfolio balance model the wealth effects on stock and flow conditions are quite different. Using his model, McKinnon proceeds to re-examine the assignment problem as formulated by Mundell (23, 1968, Chapters

15-18), Fleming (7, 1962), Krueger (15, 1965), and Sohmen (29, 1967). He considers cases of perfect capital mobility and immobility under floating and fixed exchange rates essentially in the same way as the authors listed above. Since, however, McKinnon's wealth is differentiated, he is able to distinguish between inside and outside methods (as postulated by Gurley and Shaw (10, 1960)) of changing the stock of money. Not surprisingly, his results, in some instances, are at odds with those obtained by Mundell or Sohmen. McKinnon concluded that "..a deficit in the fiscal authority's budget in a non-growing economy [N.B.: both Mundell and McKinnon deal, of course, with states of stationary equilibrium] with a fixed exchange rate and no trade controls must eventually lead to a continuous flow of exchange reserve losses of the same magnitude. Monetary policy confined to adjustment in stocks is not an effective substitute for exchange-rate variations to enable the economy to achieve both internal and external balance in a stationary situation over any extended period of time."

The contradiction between McKinnon's and Mundell's findings is fortunately spurious. As Krueger pointed out in her comment on McKinnon's paper (17, 1969), all discussions of the assignment problem have been explicitly short run in nature, since no country (abstracting from key currency contries) can permanently finance its trade deficit by capital inflows (and the concommittant increase in its interest obligations). The real difference then between Mundell and McKinnon is in the time horizon. McKinnon's time horizon is short (the price level is fixed, asset valuation is independent of the interest rate, net investment is zero), but Mundell's is even shorter.

Independently, however, of the resolution or non-resolution of the assignment problem, McKinnon's work provided new valuable indications as to what the direction of the thrust of further research may be. In particular,

as Anne Krueger (17, 1969, p. 249) stated, "Use of McKinnon model with varying rates of adjustment in different markets might yield some important insights into the nature of external and internal imbalances and alternative adjustment mechanisms." For some time no new work along these lines was forthcoming. Three years after McKinnon's paper had been presented (September 1966), Anne Krueger complained (16, 1969, p. 22-23) that current balance of payments theory still has little to say about the relationship between stocks and flows, that "growth models incorporating increasing asset demand as well as changing flows, hardly exist," and that there is no theory of long-run (as distinct from Mundell's short-run) adjustment of internal and external imbalances. Fortunately, since the time of her complaint the situation has vastly improved.

Current Literature

The authors employing the portfolio-balance approach to the internal-external adjustment problem are essentially interested in positing Mundell's problem in a longer (or a very long) time perspective. In contradistinction to Mundell, who is interested in efficient stabilization policies, they are concerned with two interrelated but separate questions: 1) What is the impact effect of a given policy mix suggested by portfolio-balance model? 2) What is the change in the growth path resulting from these policies?

The most obvious extension of the short-run portfolio-balance model is the one incorporating changes in the rate of growth of physical capital. For instance, a contractionary monetary policy undertaken in order to eliminate external deficit will result not only in an immediate reduction in the level of output but also in the decline in the rate of capital accumulation, and

hence in smaller output in subsequent periods. Short-term efficiency of a given policy mix may turn out to be not the most efficient in the longer run. Moreover, what is even more important in the context of problems investigated, the attainment of short-term external balance may aggravate the deficit in the future. Questions of this type were subjected to critical analysis by Branson (3, 1972) and Tower (30), 1972). It must be noted, however, that their models, although admitting changes in flows resulting from different equilibrium stock levels, remain short-run in nature.

Long-run models began to emerge in Chicago in 1969-70. Their common features are reliance on relations involving wealth and saving similar to that postulated by Metzler (21, 1968) and (22, 1969), and emphasis on portfolio considerations. In its dynamic aspect these models are extended along the lines suggested by Foley and Sidrauski (8, 1971, especially Chps. 6-10 and 15, 16) and elaborated by Mussa (25, 1973).

An early treatment by Komiya (14, 1969) still dealt mainly with impact effects of different policies or shifts in exogenous variables and therefore the author could assume instantaneous stock adjustment. But later work by the Chicago disciples of Johnson and Mundell attempted to incorporate the ingredients, which Anne Krueger had identified as lacking, to make the balance-of-payments theory more comprehensive. Dornbusch (4, 1971) analyzed the adjustment process involved in moving from one steady state to another. This was a somewhat novel approach, since the principal concern of previous literature had been with effects of changes in the equilibrium level or rate of growth of income on the equilibrium balance of payments. In addition, Dornbusch specified the source of growth and the disposition of the increments in income. In other words, he showed that if one is concerned, and in the long-run one should be, with the effects of growth on various balance-of-payments accounts, it matters whether

the increased income is due to the increased capital stock or a larger labor force and whether it results in a higher level of consumption or faster accumulation of assets. Purvis (28, 1972) extended Dornbush's model by allowing for disequilibrium in asset holdings and forcefully distinguishing between impact effects and ensuing transition to the new steady state path. Like Dornbusch, Purvis stresses the important distinction between income and output in open economy models due to debt servicing. Income is defined as production owned by the residents (including the government), whereas output as production located in the country, the difference being the world rate of interest times the residents' net foreign asset position. This analysis of the adjustment process in a "small country" with a fixed exchange rate yields some very interesting results. For example, Purvis analyzes the impact effect and ensuing adjustment due to an increase in the money supply as a result of an increase in the size of government deficit. The domestic "flow supply" of real balances rises immediately, but the "flow demand" rises only slowly with output, which, in turn, rises as domestic public and private claims on the world capital stock are increased. The short-run effect then is the reduction of the payments surplus (or generation of a deficit), while the longer-run effect may be the improvement in the payments position if output rises to such a level that the flow demand increases by more than the flow supply of real balances. Hence not only some oscillatory adjustment in the balance of payments is implied, but the possibility arises that expansionary monetary policy could eventually lead to an improvement in the balance of payments.

The distinction between stocks and flows and emphasis on the role of asset-market equilibrium in the adjustment process certainly is capable of providing valuable insights into transitional and long-term effects of

various exogenous disturbances on the balance of payments. Some of these insights are impossible, and some very difficult, to obtain when Keynesian models disregarding stock adjustment are used.

Conclusion

Models explicitly incorporating considerations of portfolio equilibrium are a very young, but rapidly expanding, branch of economic literature. Some, of the most interesting work is still in the form of discussion papers or privately circulating manuscripts. The trend seems to be toward greater generality and away from the assumptions of Keynesian models. Thus Dornbusch (5, 1973) assumed full employment and flexible relative prices and concentrated on the long-run effects of policies when the supply of assets is endogenous. He recognizes that his model is still enormously restricitve because of its strong assumptions, so that the implications to be derived from it should be treated with caution. Nevertheless, some of his conclusions, most notably on differences between short- and long-run effects of open-market operations on the stock of assets equilibrium, are worth pondering.

The most comprehensive in this class of models seems to be the one by Frenkel and Rodriguez (9, 1974). It is in the same tradition and uses many of the same techniques as models employed by Komiya, Purvis and Dornbusch. What makes the Frenkel and Rodriguez model by far more complete (and complex) is the full specification of consumption, production, and investment functions and the interrelated demand for assets. With the aid of such a model they explore in great detail the exact channels through which the short-run and long-run adjustments take place. They do this under varying assumptions as to the exact policy instruments used and as to the exchange-rate regimes. Some of their results, even for the short run, do not coincide with the results

yielded by pure flows models.

The portfolio-balance approach is in its essence of a general-equilibrium type. What it makes abundantly clear is that for any value of the exchange rate there exists a particular constellation of domestic prices (including the interest rate), stocks of assets, and the size of government debt, corresponding to which there would be both internal and external equilibrium. The existence of an external deficit implies that the exchange rate or some other variables have to change to restore equilibrium. What appears to be the main practical advantage of the portfolio-balance approach is the explicit recognition that different controls over different variables referred to above entail a different time path for the economy; and each such path is associated with different welfare implications.

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