

## A Note on External Adjustment

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### I. Introduction

Formal exchange rate and balance of payments analysis tends to be highly susceptible to selectiveness over the causative determinants of the phenomenon it seeks to explain. The selection criteria appear to be influenced by contemporary fashion in economic thought or analysis together with variable commitments to ideological purity on the part of analysts. As a consequence, results tend to lack generality and robustness, and they are quickly superseded by the ensuing wave of fashion – a process that helps to evoke presumptions of “the fickleness of conventional economic wisdom” (Marris, 1984). Such vacillations are exemplified by the series of formal approaches to the balance of payments that have successively emphasized [trade] elasticities, absorption, monetary [sector] or [financial] assets as the strategic domains for formal analysis, as well as by the oscillations in the advocacy of exchange rate flexibility. The analytical products of the various approaches are at times emphatically differentiated, for example by ostensibly mutually exclusive claims that the exchange rate is the relative price of national outputs or of national monies. Associated with these alternative assertions is the avowed intent to explain *either* the current account *or* the capital account (or, under fixed exchange rates, the “money account”) of the balance of payments. Any need for a simultaneous and consistent explanation of the behaviour of the complementary account(s) is disavowed by reference to accounting identities, budget constraints, or invisible Smithian extremities, or it is simply not acknowledged. Alternatively, recognition of the coexistence of and interaction between the two major subaggregates of the balance of payments may preempt definite conclusions or necessitate the acknowledgement of paradoxical implications that are carried by the formal analysis of one component for the other. An aprioristic postulate of asymmetric market clearing behaviour in the two main spheres of analysis is occasionally invoked to release the resulting tension. Thus, analysis of an

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ostensibly general equilibrium conception turns out to be rather partial on delivery – a disfigurement that impairs the longevity of the progeny while animating the vigorous procreation previously alluded to.

The apparent dilemma is this: the focus on the capital account and asset markets seems indispensable for explaining the observed volatility of exchange rates but it may carry curious implications for the current account or for international commodity price relationships. And, conversely, predominant emphasis on current account phenomena is incapable of elucidating the salient features of exchange rate behaviour. This dilemma has spawned the succession of balance of payments models which have been motivated by perceived practical urgencies, such as the persistence of current account imbalances or the gyrations of exchange rates, as well as by analytical developments that promoted the transition from short-run flow analysis to a comprehensive long-run stock-flow framework. The advances in analytical rigor and in the understanding of particular (and transient) economic phenomena have, however, made little apparent contribution towards the resolution of the basic dilemma. Assertions of the alternative dominance and passive complementarity, respectively, of stylized real and financial worlds, supplemented by allusions to the homogeneity postulate and various adding-up requirements, are not conducive to an integrated and operationally useful perception of short-run balance of payments adjustment behaviour.

## **II. Features of Contemporary Analysis: Partitioning and Insularity**

Investigation of a recent generation of balance of payments or exchange rate models – the asset(s) approach – will make the discussion more concrete. The purpose of these models is to explain the determination of exchange rates in a manner that is consistent with their observed volatility. Prominent emphasis on the tautological and correspondingly vacuous proposition that the exchange rate constitutes the relative price of national monies or assets (depending on the richness of the asset menu that is proffered in the particular model) immediately delineates the markets for financial assets and, consequently, the capital account of the balance of payments as the relevant sphere for formal analysis. Common behavioural assumptions are that risk neutral transactors form expectations rationally, that asset markets are efficient, and adjustment, therefore, is exceedingly rapid – instantaneous, for simplicity. There are no transactions costs. The exchange rate is driven by the interplay of stock demands for and supplies of the relevant financial assets until imbalances between them are elimi-

nated. Portfolio disturbances generate yield differentials that give rise to portfolio-equilibrating capital flows. Specifically, domestic monetary expansion results in (incipient) capital outflows and exchange depreciation sufficient to eliminate the portfolio disturbance. Properly functioning markets ensure that the current account accommodates these capital account developments, as dictated by the balance of payments constraint.

The nature of the current account adjustment process is frequently not spelled out in detail. The unambiguous presumption is that the capital outflow-induced nominal depreciation is associated with a surplus on the neglected current account – a presumption that is weakly compatible with the Marshall-Lerner criterion to the extent that the current account improvement is attributable to the trade balance. However, empirical observation fails to corroborate the stability of this relationship. In recent history, for instance, US exchange rate experience appears to have conformed only fleetingly to this scenario of strong dollar appreciation and current account deficit. And that appreciation has been shown to have exceeded substantially the exchange rate movement required for asset market balance (Koromzay et al., 1987). By contrast, the dominant experience of the 1970s and since 1985 was, and is, the obverse association between current account deficits and nominal US dollar depreciation. There is no compelling empirical support for the presumption of a predictable, capital account-driven, association between movements in the current account and in the nominal exchange rate.

One way out of this dilemma of the asset approach has been charted in *Dornbusch's* (1976) seminal exchange rate dynamics model. Here the association between a trade surplus and exchange rate appreciation follows from the initial overshooting of the exchange rate in response to domestic monetary expansion. The rationale for this behaviour pattern resides in the aprioristic postulate of asymmetric adjustment speeds in the markets for goods and for financial assets and the eventual reversal of the excessive initial adjustment in the fast reacting asset markets. One of its implications is the continuous violation during the adjustment process of PPP as domestic inflation coexists with exchange appreciation. The fundamental equilibrium requirement of purchasing power parity is firmly relegated to the comparative statics of the model, and commodity arbitrage is presumably suspended as the economy gropes toward the new equilibrium.

To some extent the contentious features of asset models are a consequence of the methodological strategy of partitioning the economy. Modelling proceeds on a dual track, separately analyzing the financial world in a short-run context and the real world over a longer time horizon. Formal reconcil-



iation of the two spheres occurs in long-run equilibrium where the seemingly parallel rails of the track are made to intersect. The strict dichotomy between the real and financial sectors is not conducive to the resolution of the dilemma that confronts external balance analysis. "It is generally impossible to isolate a subset of markets which can determine the equilibrium values of a subset of prices" (*Patinkin*, 1965, 181). Important insights into balance of payments dynamics may be sacrificed by postulating the exogeneity of the real sector for the analysis of portfolio adjustment and, alternatively, investigating the real sector on the background of continuously balanced portfolios.

Such disregard of the nature of the adjustment process appears to be engendered also by intertemporal substitution models to the extent that they treat the current and capital account balances as strictly identical but alternative manifestations of a given micro-decision (for instance *Sachs*, 1981). Micro-behaviour is assumed to be driven by permanent income, subject to intertemporal budget constraints. Current and capital account imbalances are the joint consequence of consumption-smoothing behaviour. They exert no wealth effects since external imbalances constitute merely adjustments to the time profile of asset holdings. Their equivalence depends critically on the irrelevance of current income for spending and saving plans. Insistence on their identity preempts some of the pitfalls of the asset approach, but it also narrowly circumscribes the nature of the adjustment process by precluding interaction, and the emergence of residual imbalances, between the component accounts that may exert conflicting influences on the exchange rate.

The explanatory power of some open economy models is further compromised by their "insularity" characteristics (*McKinnon*, 1981; *McKinnon* and *Ohno*, 1986), notwithstanding their formal recognition of international commodity and asset arbitrage. This feature may be symptomatic of the preoccupation of open economy analysis with dominant countries, in particular with the conventional perception of the US as a "large" country with a trivially small tradables sector. But it fails to capture the quintessence of economic openness and, consequently, the salient features of the majority of trading economies. Full employment assumptions and reliance on the trade balance stabilising effects of nominal exchange rate changes, epitomised in the *Marshall-Lerner* condition, abstract from the disruption and instability that may be engendered by nominal exchange rate variations in highly open economies. Recent experience suggests that some of these disruptions are not readily reversible in response to exchange rate realignment. Further, the presumption of nominal exchange rate-induced fluctuations in real

exchange rates attests to limitations of the influence that nominal exchange rates are permitted to exert on domestic price levels, and to the corresponding insulation of the domestic monetary sector from developments in international financial markets. Recommendations for sterilisation policies tend to buttress the presumption of monetary insularity.

At the other extreme, the postulate of uncovered interest parity, predicated on the assumption that financial assets are perfectly substitutable, and the implied exogeneity of “the” domestic rate of interest<sup>1</sup>, ostensibly encapsulates the concept of perfectly integrated world financial markets, but its implementation is peculiarly selective. The perfect substitutability property tends to be confined to bonds, and it coexists, other than in currency substitution models, with the strong assumption that separate demand functions for each national money can be defined, and that these are stable. Moreover, the assumption that bonds are perfect substitutes limits the range of feasible international financial transactions by precluding those that are prompted by purely financial motives and by the intrinsic heterogeneity of financial instruments denominated in different currencies. No individual investor need agonise whether to borrow in South African Rand or in Japanese Yen, or whether to refinance outstanding loans, since the nominal interest differential is deemed to reflect fully any comparative advantage inherent in either denomination, precluding any potential gain from choosing between the available alternatives – hardly a reflection of the decision problems confronting corporate treasurers in highly open economies.

### III. Portfolio Composition

In order to capture some facets of the interaction between the real and financial sectors, and to preempt the presumption of monetary insularity, it may be useful to specify an alternative asset menu. Let portfolios contain real assets and financial assets instead of being restricted to the conventional constituents of money and bonds. The inclusion of real assets in portfolios establishes a link to the real sector, while the assimilation of money and bonds into financial assets eliminates a priori restrictions on the influence of international financial developments on domestic financial markets.

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<sup>1</sup> The small country presumption of strict exogeneity of the domestic interest rate becomes untenable with the relaxation of the assumptions of uniform expectations or risk neutrality (Ng and Fausten, 1987).

The inclusion of real assets in portfolios merely amounts to a formal recognition of the existence in most economies of extensive markets in existing capital goods, be they business fixed capital equipment, inventories, dwellings or consumer durables, and of the susceptibility to exogenous disturbances of transactions in these markets. This structural modification does not impose any particular restrictions on the nature of the transmission mechanism of exogenous disturbances. It merely obliterates the conventional and somewhat contrived distinction between the so-called “direct” and “indirect” transmission mechanisms. Comprehensive asset substitution permits transactors to adjust their holdings of transport equipment or real estate, for instance, as well as of securities in the pursuit of portfolio balance. The particular adjustment path is not determined aprioristically but rather depends on the prevailing circumstances.

The absorption of money into financial assets avoids arbitrary categorisation of an exceedingly fluid and malleable financial asset topography. A cost of this simplification is to obfuscate the distinctness or uniqueness of money. But this cost does not appear to be prohibitive in the context of adjustment behaviour. In the first instance, the conceptual construct “money” lacks an unambiguous and clearly quantifiable empirical counterpart; the operational content of particular empirical proxies has been eroded progressively by financial innovation and deregulation; and even the specification of the conceptual construct itself is not beyond dispute. One hesitates to stress the analytical importance of a phenomenon so pervasively lacking in concreteness.

Secondly, it is not clear that the stock of money should be assigned pre-eminence in short-run adjustment even if the conceptual and definitional issues could be resolved satisfactorily. The observation of the indispensability of money for transactions in a monetary economy is almost trite were it not for the endemic confusion that Clower sought to clarify with his unequivocal aphorism: “Money buys goods and goods buy money; but goods do not buy goods” (1967 [1969], 207 - 8). This quintessential characteristic of a money economy does not imply, however, that actual money holdings constitute the causative determinant of transactions, or that they necessarily subject these to impenetrable constraints, as might be inferred from the preoccupation with real balance effects that distinguished the monetary approach to the balance of payments (*Fausten*, 1979). While the aphorism states categorically that cash balances are indispensable for transactions, it says nothing about their source. All it stipulates is that a monetary quid pro quo must be tendered in exchange. Whether that quid pro quo is procured by means of depleting the existing stock of cash balances or through a separate,



and generally though not necessarily antecedent, enabling asset exchange is of no immediate significance. Consequently, the binding constraint on purchases of goods is imposed not by the actual stock of cash balances held but by the stock of liquid financial assets. Even abstracting from such money surrogates as credit cards or overdraft facilities, transactions balances can always, and virtually instantaneously, be procured by liquidating other assets or, subject to the relevant creditworthiness criteria, by issuing debt instruments. Disregard of the distinction between transactions requirements and expenditure constraints, in other words the presumption that during the process of short-run adjustment the transactions volume is in some irrevocable way limited by the size of the existing stock of cash balances and that the velocity of money is absolutely constant, helps to explain some of the incongruities of balance of payments analysis, and of the monetary approach policy recommendations in particular (*Tsiang, 1977*).

The focus on expenditure constraints does not by itself provide a compelling rationale for the distinction between financial and real assets in portfolios. Rather, it reflects the orientation of the intertemporal substitution approach with its emphasis on permanent income or permanent net wealth as the ultimate expenditure constraint. All wealth components command purchasing power and are potentially convertible into other assets or current consumption, provided asset markets are reasonably efficient. In extremis, the potential real estate acquirer can conceivably procure his immediate transactions cash requirements by selling the “family silver” adorning his household or, for that matter, another piece of real estate.<sup>2</sup> However, liquidity considerations or market structures and associated capital risks may exert locking-in effects and to that extent inhibit or preclude certain asset substitutions, at least temporarily. But the incidence and extent of market imperfections are susceptible to changes in the economic environment. That latent ephemerality preempts their eligibility as an adequate criterion for wealth disaggregation. Similarly, recourse to the short-long distinction is precluded by its lack of operational usefulness; long-term government paper is generally more marketable than the bulk of commercial short-term paper. The rationale for a meaningful wealth decomposition must be embedded instead in some property that is, respectively, common to the components of either type and that simultaneously serves to differentiate the two categories. That property is embedded in their disparate yield characteristics: financial assets constitute claims to income

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<sup>2</sup> This is not as paradoxical as might be averred on impulse: real estate markets are highly susceptible to significant, albeit transitory, sectoral and geographical shifts in profitability assessment.

streams that are fixed in nominal terms whereas real assets are claims to real income streams.

#### IV. Adjustment

Asset demands are influenced by expected yields and by transactions plans. Provided the demand for financial assets is a real demand, portfolio disturbances may alter the relative yields on financial and real assets, initiating adjustments that affect the real sector directly. This interconnectedness between sectors is reinforced by the income-elasticity of asset demands.

##### 1. *Changes in Yields*

Suppose that portfolio balance is disturbed by an increase in money which is generally acknowledged to exert an expansionary impulse, albeit subject to long and variable lags. To the extent that the domestic price level is expected to increase, the present worth of the expected real income stream accruing to existing financial assets diminishes relative to that from real assets. In their attempt to dispose of financial assets transactors cause their prices to decline, nominal interest rates to rise, and the prices of real assets to increase, thus generating capital losses and gains, respectively, on the two asset categories. The effect on net wealth is ambiguous, depending on the underlying demand elasticities, and on the pattern of expectations about the magnitude as well as the time path of the eventual adjustment to the monetary expansion. It is also susceptible to transactors' probability estimates of the occurrence of further disturbances, including revisions in the stance of monetary policy.

In an open economy adjustment is constrained by international commodity and asset arbitrage. A popular version of the small country model stipulates long-term PPP and perfect substitutability of financial assets, thus uncovered IRP. Given the additional assumptions of monetary neutrality and full employment, the domestic price level is expected to increase equi-proportionately with the monetary expansion. The expectation of an equivalent nominal depreciation follows from PPP, and it generates, on the strength of uncovered IRP, a corresponding interest differential. The spot rate may remain unchanged initially, or there may occur an immediate depreciation with a corresponding reduction in the expected depreciation and in the increase of the domestic interest rate. Either way, the exchange



rate is driven by inflation, actual and expected, and the (incipient) capital movements that it induces. Any perceptions of exchange risk resulting from the policy shock are compensated by risk premia that drive a wedge into the interest parity relationship.

If the relevant substitution relationships are such that the market revaluations of real assets that are induced by the expected increase in the price level re-establish the initially prevailing real rate of return, and if uncovered IRP holds continuously, then no asset need change hands. The portfolio consequences of the monetary expansion are absorbed by opposite movements in the market prices of financial and real assets and corresponding adjustments in their nominal yields. Any possible real effects are confined to the wealth effects of capital gains and losses that may feed back into the asset demand functions and require some adjustment in the yield structure.

The determinism of the adjustment process, and its essential triviality, is eroded by relaxing the restrictive assumptions of the popular small open economy framework. If, in accordance with market perceptions, financial instruments are considered to be differentiated, or if expectations across all transactors and time horizons are allowed to be non-uniform, then the world demand for domestic bonds ceases to be perfectly elastic, and a wedge is driven into the otherwise tight international interest rate relationship. Released from the constraint of uncovered IRP, the domestic real rate of interest can diverge from the world rate to the extent that the forward rate fails to predict accurately the future spot rate. Some evidence (*Meyer and Startz*, 1982) suggests that the variance in the forecast errors of the forward rate may be attributable predominantly to errors in forecasting real variables.

In the absence of full resource utilisation and perfect foresight, the expansionary monetary stimulus may raise the expected yield on real assets and cause their demand schedule to shift outwards (*Keynes*, 1936, Ch. 11). Ebullient sales and profit expectations, the application of previously unemployed resources to capital, and product shifting towards capital-intensive activities<sup>3</sup> shift the MEI schedule up and increase the desired rate of capital formation at given market yields on equities. The excess demand for real assets may be enhanced further by asymmetries of the tax structure and by the distribution of capital gains. More extensive opportunities for tax deferral and loss offsets may imply a larger post-tax yield differential in favour of real assets for given pre-tax yields. Since capital gains accrue pre-

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<sup>3</sup> *Kessel and Alchian* (1962, 533 et sequ.) emphasise the importance of factor intensities in tracing the consequences of an inflationary stimulus.

dominantly to portfolios dominated by real assets, wealth effects (to the extent that they are operative) further stimulate the relative demand for real assets unless the portfolio balance equations are revised.

Given the fixity of the existing capital stock and short-run limitations on the domestic supply of new capital goods, the yield-induced demand shift exerts upward pressure on the market price of real assets and of titles to them. The ensuing increase in the domestic supply price of capital goods is limited by the short-run elasticity of world supply, and it is subject to exchange rate changes that may be induced by the monetary expansion. Suppose, in the spirit of the small country framework, that the world supply of capital goods is perfectly elastic so that any nominal depreciation is fully reflected in the domestic supply price of new capital goods. Revaluation gains accruing to owners of existing real assets depend on the extent of transmission of the price rise. In the polar case of total transmission, the revaluation gains are maximised and may further augment the demand shift towards real assets.

But the assumption of perfect elasticity is purely hypothetical. It is exceedingly unlikely that the particular domestic requirements for capital goods can be accommodated instantaneously by foreign suppliers. Consequently, the increase in the domestic supply price exceeds the devaluation effect, and the revaluation gains accruing to owners of existing real assets are correspondingly larger. The less open the economy and the more domestic prices are insulated from the consequences of exchange rate changes, the smaller are the valuation gains arising from this source. But at the same time, greater insularity implies also that the scope for accommodation of the excess demand for capital equipment from external sources is reduced, thus increasing the upward pressure on domestic prices.

The balance of payments consequences of the portfolio disturbance initiated by monetary expansion follow immediately. The relative rise in the expected rate of return on real assets attracts an inflow of capital, while the excess demand for capital goods causes a deterioration of the current account. In the present context, the current account response is not dominated by the direction of exchange rate movement but is instead related to the imbalance in the market for real assets. Excess demand for real assets stimulates spending in the real sector and causes the current account to deteriorate. The frequently observed but supposedly paradoxical failure of the current account to respond favourably to exchange depreciation assumes plausibility in the context of portfolio adjustment involving substitutions between financial and real assets without recourse to such ephemeral phenomena as J-curve effects. The short-run adjustment response to the

portfolio disturbance thus generates qualitatively mutually consistent movements on the current and capital accounts.

The quantitative effects of the portfolio disturbance depend on the relevant behaviour parameters, and are correspondingly ambiguous. Differential adjustment speeds in financial and real markets suggest that the capital account response initially dominates the current account response. Capital inflows mitigate the tendency toward nominal depreciation arising from monetary expansion, or they may even reverse it. To the extent that the portfolio shift away from financial assets involves the disposal by domestic wealth owners of foreign assets, the improvement on capital account is strengthened by these repatriation flows. If short-term expectations formation is susceptible to the evolution of the capital account instead of being dominated by the properties of long-run equilibria, then the capital inflows may give rise to expectations of appreciation. Even if the appreciation is expected to be only transient, at least some portfolio holders will switch from foreign to domestic financial assets or they may incur liabilities overseas. That response temporarily enhances the capital account surplus.

These reactions are, however, subject to the adjustment path of the domestic rate of interest. Under the confines of uncovered IRP, domestic monetary expansion must be fully reflected in the joint movements of the domestic interest rate and the exchange rate such that any interest differential that emerges reflects the residual expected exchange rate movement towards long-term PPP. Either the exchange rate depreciates instantaneously, commensurately with the expected inflationary impact of monetary expansion, and interest rates do not move. Alternatively, in the absence of any immediate depreciation, monetary expansion causes the interest rate to rise commensurately. Or the inflationary effect is absorbed by some combination of instantaneous depreciation and interest rate movement. This rigid relationship need not hold under the weaker assumptions of the present argument. Expectational factors (call them “mistakes”), safe-haven considerations, or bandwagon effects, spurred by the increase in the expected yield on domestic real assets, may drive a wedge into the interest parity relationship. This wedge could be embedded, for instance, in the forecast error of the forward rate. Then a covered interest differential in favour of the home country would emerge that accelerates the rate of capital inflow and reinforces the presumption of an “attractive” investment climate in the home country.

This scenario of a drift towards exchange rate overvaluation bears some qualitative resemblance to the US experience during the early 80s.



“The notion that the dollar was overvalued and headed for a correction was widespread for as much as two years prior to the onset of depreciation. A central puzzle is why forward-looking financial markets did not internalise this expectation. Why did financial markets persist in bidding up the dollar in the face of widespread recognition that this course was unsustainable – ...” (Koromzay et al., 1987, 23).

The contention of the present argument is that elucidation of the enigmatic nature (to paraphrase *Emminger*, 1985) of balance of payments and exchange rate behaviour is not amenable to the restrictive “vision” that has characterised successive generations of dominant open economy models. Instead of assigning pre-eminence to either the current or the capital account, both accounts should be accorded equal prominence in exchange rate determination. The *prima facie* case for the emphasis on the interaction between the real and financial sectors during the process of adjustment has directed attention to changes in the relative yield of financial and real assets in the preceding discussion. A further intersectoral link is provided by income and the influence that changes in income exert on asset choice.

## 2. Changes in Income

Consideration of the effects of changes in income is obviated in many asset models by the assumption that full employment prevails continuously. Alternatively, investigations that do recognise the variability of output and employment tend to impose strict partitionability on the model, and to rationalise the sequential equilibration of assets and goods markets in terms of differential adjustment speeds in these markets.<sup>4</sup> Notwithstanding its expediency in formalizing behavioural differences in market clearing as well as in facilitating the practicalities of rigorous modelling exercises, this stratagem is suspect. On the one hand, it evades some of the analytical problems raised by the alternative specifications of asset market equilibria in continuous and in discrete time (Foley, 1975; Kouri, 1976). On the other hand, the sequential approach is counter-intuitive in that it disregards the essential simultaneity of adjustment processes and their continuous interaction in all markets. Partitioning ignores the ubiquity of interaction and confines intersectoral interdependencies to channels that are not particularly efficacious at circumventing notable “pitfalls in financial model-building” (Brainard and Tobin, 1968).

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<sup>4</sup> For example, Allen and Kenen (1980) exclude income from the specification of the money demand function in order that “the money and bond markets are not affected instantaneously by changes in goods prices or aggregate demand, and the exchange rate is determined in the short run by the money and bond markets, jointly with the interest rate on the domestic bond” (p. 16; and also p. 207).

Let income be included in the demand function for transactions assets in recognition of the incontrovertible fact that exchange relationships are monetised. This necessitates that income be included also in the remaining asset demand functions (*Brainard and Tobin, 1968*). Since the income coefficients must sum to zero it follows immediately that an increase in transactions activity reduces the demand for non-transactions assets. This structural relationship may extend to foreign assets. Provided that net foreign assets are not complementary with assets that are required for transactions purposes, some part of the additional transactions asset requirement will be procured by a reduction in net foreign asset holdings – i.e., by means of a capital inflow. This portfolio adjustment in response to changes in aggregate demand generates, at least conceptually, a capital account response that is qualitatively consistent with the simultaneous deterioration on current account. The improvement on capital account is stronger the higher the degree of substitutability between domestic and foreign non-transactions assets. Such transactions-induced capital flows introduce ambiguity into the qualitative effect of exogenous portfolio disturbances on the exchange rate (*Tobin and de Macedo, 1980*). They may be augmented by yield-induced capital inflows, depending on the effect that the increase in domestic activity exerts on relative asset yields.

It might be objected that the phenomenon of transactions-induced capital movements is but an analytical curiosum of little quantitative significance, or even that it is theoretically inconsistent (in continuous time) with an inventory-theoretic explanation of the transactions demand for money. The latter criticism has been addressed by *Hellwig (1975)*. Insistence on the essential triviality of the phenomenon may be confronted, in the first instance, with reference to the “statistical discrepancy” (or “errors and omissions”) in the balance of payments accounts. These entries are frequently regarded as unrecorded capital flows; they have become increasingly significant quantitatively; and they are not readily explicable in terms of yield and “news” variables that figure prominently in capital flow equations.

The influence of income on the capital account need not be restricted to the demand response for other assets that is implied by the positive income-elasticity of the demand for transactions assets. It derives additional behavioural content from “the important categories of equity and direct investment ... [that] are likely to be governed more by profit prospects associated with the level of income than with the interest rates available on financial claims” (*Johnson, 1966, p. 350*). Information in support of this phenomenon is reported in *Ruffin and Rassek (1986, p. 1124)*, who identify

a negative influence of domestic real income on US capital outflows, and is corroborated by my preliminary investigations of Australian data. This “income-mobility” of capital is activated by buoyant aggregate demand or by the expectation of such buoyancy. The resulting capital inflows assist the private financing of current account deficits and, at the same time, they moderate the automatic forces of credit tightening that curb the expansion in the goods sector.

Expenditure-smoothing behaviour may also contribute to the income-capital account nexus. For instance, the intertemporal allocation of expenditure on plant and equipment, consumer durables or residential investment, and the financing of that expenditure, are responsive to fluctuations in income. To the extent that unanticipated increases in future income bring forward the timing of such acquisitions they precipitate a shift from financial to real assets in the present. This shift is followed in the future by the replenishment, and the resumption of the desired growth path, of financial assets as the additional income accrues. Future increases in income, then, encourage the present depletion of net financial asset holdings, including net foreign assets, in order to finance a higher level of current spending and the associated trade deficit.

The influence of income or transactions activity on the capital account may also originate from preferences regarding the currency composition of asset inventories. As domestic income rises, portfolio holders (domestic as well as foreign) may increase the proportion of their portfolios denominated in domestic currency in anticipation of greater participation in domestic goods and assets markets. Such apparent attribution of utility to the currency denomination per se, as distinct from the risk-return characteristics of assets, may appear to violate the credo of rationality in an environment of efficient markets. But agents may not be quite that rational all the time; subjective (albeit perhaps misinformed) experience may encourage them in the belief that gains can be made by going against the market; manifestations of risk aversion may differ among groups of transactors (*Fellner*, 1980) or they may perceive differentially instances of market imperfection or their uncertain prospect such as temporary impositions of exchange controls or interest equalisation taxes. As long as some agents hold lingering reservations about the universal veracity of the presumption that asset market equilibrium is continuously maintained, and that all potential gains are instantaneously arbitrated away, the currency mix of portfolios is of relevant concern. Preferences over currency habitats, “safe-haven” considerations or susceptibility to transactions and precautionary motives for the choice of asset denomination, are responsive to variations in national



transactions activity. Domestic expansion attracts capital inflows via this route.

## V. Conclusion

The focus of modern open economy analysis has alternated between the current and capital accounts of the balance of payments, and concomitantly between goods and assets markets as the source of autonomous forces that drive external adjustment. Such vacillation in analytical focus, combined with the oscillations in the advocacy of exchange rate flexibility, indicates analytical and conceptual ambivalence, notwithstanding the occurrence of profound changes in the institutional environment, most prominently the dismantling of exchange controls and the progressive integration of international financial markets. Institutional changes may alter the magnitudes of relevant behaviour parameters, but they do not, in general, transform the true behavioural structure of economic relations and render correctly specified models obsolete. Consequently, institutional developments do not provide a compelling justification for the observed vacillations in analytical orientation. These have been prompted instead by the manifest inadequacies of successive generations of dominant approaches to the balance of payments. They have not achieved any sustained success in generating reasonably accurate predictions of balance of payments or exchange rate behaviour.

Two sets of considerations, relating to economic insularity and to analytical partitioning, may account for this poor record. Both are attributable ultimately to the failure to perceive of all facets of international economic relationships as intrinsic components of the aggregate economic structure. Open economy models based on closed economy macro-models that are augmented by a suitably specified external sector are inherently insular. Selective modifications of particular behaviour relationships and introduction of international arbitrage conditions are inadequate to capture the pervasiveness of external influences on the domestic economy, and thus do not obliterate the basic conception of insularity. Partitioning, on the other hand, ignores the essential simultaneity of adjustment behaviour in all sectors of the economy. Instead, it assigns preeminence to either the financial or the real sector, and to the corresponding component account of the balance of payments, and imposes strict temporal sequencing on market clearing behaviour. However, the adjustment process is characterised by continuous interaction between the financial and real sectors that simultaneously drives both the current and the capital account towards equilibrium along

mutually compatible adjustment paths. Differences in adjustment behaviour such as differential adjustment speeds may cause transitory clearing to be achieved more quickly in some markets than in others, but they do not contain the forces making for adjustment within the confines of a particular sector.

The present paper suggests that strategic features of adjustment in the open economy may be captured in an extended portfolio balance framework that recognises gross substitutability between real and financial assets. Provided that portfolio disturbances alter their relative yields, they precipitate asset substitutions that provide an immediate link between the real and financial sectors and thus to both, the current as well as to the capital account. This link is reinforced by the influence of income on asset choice that imparts the property of “income-mobility” to international capital movements.

This framework provides an internally consistent explanation of the response of the balance of payments, and of its component accounts, to portfolio disturbances. In contrast to partitioned asset models, it assigns equal prominence to the current and capital accounts in exchange rate determination, obviating any presumption of a stable relationship between the exchange rate and each component account. Economic shocks, by virtue of their pervasiveness, elicit responses on both component accounts. While mutually consistent, the adjustments of the current and the capital accounts are likely to differ in absolute magnitude. Any temporary imbalances during the adjustment process are eliminated by changes in the exchange rate. Consequently, the direction of exchange rate movement is not uniquely determined by the change in one of the component accounts, but by the nature of the temporary imbalance between the current and capital accounts. These temporary imbalances are influenced by relative adjustment speeds, but they are not unequivocally determined by them. They depend also on the incidence as well as the dispersion of impact effects and on the complex dynamic response pattern to the initiating disturbance.

The present discussion makes no claim to have solved the “riddle inside an enigma” (*Emminger*, 1985, 23) posed by recent exchange rate experience. Adjustments have been traced out in an extremely simple framework, and their particulars may change with disaggregation of the asset menu as well as with more rigorous specifications of savings and investment behaviour and of the government budget determinants. Neither are the particular channels for the intersectoral transmission of impulses emphasised here presumed to be exhaustive. Further clarification of the effects of nominal disturbances on real flows during the short-run adjustment process may be

promoted by the incorporation into open economy macro-analysis of relevant facets of the micro-foundations that are being investigated in the pure theory of trade, such as the implications of factor specificity or trade in middle products.

The basic contention advanced here is that progress towards the solution to the exchange rate riddle may be promoted by a change in analytical direction – concretely, by including real assets in portfolios and acknowledging the influence of income on portfolio adjustment. The fundamental meaning of a capital account imbalance, and of the rate of net asset accumulation which it entails, is to finance the contemporaneous current account imbalance. Consequently, recognition of the pervasive interdependence between the real and financial sectors constitutes the fundamental prerequisite for an internally consistent and useful balance of payments or exchange rate analysis. Its exploration may not be readily amenable to the exacting requirements of formal rigor and elegance, but it is no less crucial for that apparent debility.

### References

- Allen, P. R. and Kenen, P. B. (1980): *Asset Markets, Exchange Rates, and Economic Integration* (Cambridge, Mass.: C. U. P.). – Brainard, W. C. and Tobin, J. (1968): "Pitfalls in Financial Model Building", *American Economic Review*, 58 (May), 99 - 122. – Clower, R. W. (1967): "A Reconsideration of the Microfoundations of Monetary Theory", *Western Economic Journal*, 6, reprinted in his *Monetary Theory* (Harmondsworth: Penguin, 1969), 202 - 11. – Dornbusch, R. (1976): "Expectations and Exchange Rate Dynamics", *Journal of Political Economy*, 84, 1161 - 76. – Emminger, O. (1985): "The International Role of the Dollar," *Fed. Res. Bank. of Kansas City Economic Review*, 70 (Sept/Oct), 17 - 24. – Fausten, D. K. (1979): "The Humean Origin of the Contemporary Monetary Approach to the Balance of Payments", *Quarterly Journal of Economics*, 93, 655 - 73. – Fellner, W. (1980): "The Bearing of Risk Aversion on Movements of Spot and Forward Exchange Relative to the Dollar" in *Flexible Exchange Rates and the Balance of Payments*, ed. by Chipman, J. S. and Kindleberger, C. P. (Amsterdam: North-Holland), 113 - 26. – Foley, D. K. (1975): "On Two Specifications of Asset Equilibrium in Macroeconomic Models", *Journal of Political Economy*, 83, 303 - 24. – Hellwig, M. (1975): "The Demand for Money and Bonds in Continuous-Time Models", *Journal of Economic Theory*, 11, 462 - 4. – Johnson, H. G. (1966): "Some Aspects of the Theory of Economic Policy in a World of Capital Mobility", in *Essays in Honour of Marco Fanno*, Vol. II (Padova), 345 - 59. – Kessel, R. A. and Alchian, A. A. (1962): "Effects of Inflation", *Journal of Political Economy*, LXX, 521 - 37. – Keynes, J. M. (1936): *The General Theory of Employment, Interest and Money* (London: Macmillan & Co. Ltd.). – Koromzay, V., Llewellyn, J. and Potter, S. (1987): "The Rise and Fall of the Dollar: Some Explanations, Consequences and Lessons", *Economic Journal*, 97, 23 - 43. – Kouri, P. J. K. (1976): "The Exchange Rate and the Balance of Payments in the Short Run and in the Long Run", *Scandinavian Journal of Economics*, 78, 280 - 304. – Marris, S. (1984): "Managing the World Econ-



omy: Will We Ever Learn?", Essays in International Finance, No. 155 (Princeton Univ., International Finance Section). – *McKinnon*, R. I. (1981): "The Exchange Rate and Macroeconomic Policy: Changing Postwar Perceptions", *Journal of Economic Literature*, XIX, 531 - 57. – *McKinnon*, R. I. and *Ohno*, K. (1986): "Getting the Exchange Rate Right: Insular Versus Open Economies", mimeo. – *Meyer*, S. A. and *Startz*, R. (1982): "Real Versus Nominal Forecast Errors in the Prediction of Foreign Exchange Rates", *Journal of International Money and Finance*, 1, 193 - 200. – *Ng*, Y.-K. and *Fausten*, D. K. (1987): "Interest-Rate Parity and Divergence of Views on Exchange-Rate Changes: An Upward-Sloping Supply Curve of Funds even for a Small Country", mimeo. – *Patinkin*, Don (1965): *Money, Interest, and Prices*, 2<sup>nd</sup> ed. (New York: Harper and Row). – *Ruffin*, R. J. and *Rassekh*, F. (1986): "The Role of Foreign Direct Investment in U.S. Capital Outflows", *American Economic Review*, 76, 1126 - 30. – *Sachs*, J. D. (1981): "The Current Account and Macroeconomic Adjustment in the 1970s", *Brookings Papers on Economic Activity*, No. 1, 201 - 68. – *Tobin*, J. and *de Macedo*, J. B. (1980): "The Short-Run Macroeconomics of Floating Exchange Rates" in *Flexible Exchange Rates and the Balance of Payments*, ed. by *Chipman*, J. S. and *Kindleberger*, C. P. (Amsterdam: North Holland), 5 - 28. – *Tsiang*, S. C. (1977): "The Monetary Theoretic Foundation of the Modern Monetary Approach to the Balance of Payments", *Oxford Economic Papers*, 319 - 38.

## Zusammenfassung

### Über externe Anpassung

Wechselkurse werden durch das Zusammenspiel von Finanz- und Realsektor der Volkswirtschaft bestimmt. Eine aussagefähige Erklärung des Verhaltens von Zahlungsbilanz oder Wechselkurs läßt sich wahrscheinlich kaum erreichen, wenn man sich einseitig entweder mit Aktivamärkten oder mit Gütermärkten beschäftigt. Um die Implikationen dieser wechselseitigen Abhängigkeit für das Anpassungsverhalten in der kurzen Frist zu untersuchen, werden Portfolios betrachtet, die reale Aktiva und Finanzaktiva enthalten. Das Portfolioverhalten wird durch Einkommen und relative Ertragsraten bestimmt, so daß es bei internationalen Kapitalbewegungen zusätzlich zur „Zinsmobilität“ zu dem Phänomen der „Einkommensmobilität“ kommt. Störungen lösen Aktivassubstitutionen aus, die sich nicht auf Finanzmärkte beschränken, sondern den realen Sektor direkt beeinflussen. Sie verursachen simultane und wechselseitig stimmige Veränderungen der Leistungsbilanz und der Kapitalbilanz. Alle übrigen Ungleichgewichte von Teilbilanzen werden durch Wechselkursänderungen beseitigt. Folglich weisen diese keine stabile Beziehung zu den Bewegungen einer Teilbilanz auf.

## Summary

### A Note on External Adjustment

Exchange rates are determined by the interaction between the financial and real sectors of the economy. Alternative preoccupation with either assets markets or goods markets is unlikely to yield a meaningful explanation of balance of payments or

exchange rate behaviour. In order to trace the implications of this interdependence for short-run adjustment behaviour, real assets are included in portfolios together with financial assets. Portfolio balance behaviour is animated by income as well as by relative yields, giving rise to the phenomenon of the "income-mobility" of international capital movements in addition to their "interest-mobility". Disturbances initiate asset substitutions that are not confined to financial markets but that affect the real sector directly, and generate simultaneous and mutually compatible changes on current and on capital account. Any residual imbalances between the component accounts are eliminated by exchange rate changes which, consequently, do not display a stable relationship with movements in either component account.

## Résumé

### Un commentaire sur l'alignement extérieur

Les taux de change sont déterminés par l'interaction entre les secteurs financier et réel de l'économie. Ni les marchés d'actifs, ni les marchés des biens ne sont susceptibles d'expliquer de façon significative le comportement de la balance des paiements ou des taux de change. Afin de tracer les implications de cette interdépendance pour le comportement d'ajustement à court terme, les biens immeubles sont inclus dans les portefeuilles en même temps que les actifs financiers. Le comportement de la balance des portefeuilles est stimulé par les revenus tout comme par les rendements relatifs, soulevant le phénomène de la „mobilité par rapport aux revenus“ des mouvements de capitaux internationaux, en plus de leur „mobilité par rapport aux intérêts“. Des perturbations initient des substitutions d'actifs qui ne se limitent pas aux marchés financiers mais qui affectent directement le secteur réel et génèrent des changements simultanés et mutuellement compatibles des comptes courants et de capitaux. Tous les déséquilibres restants entre les comptes composants sont éliminés par les changements des taux de change qui, par conséquent, ne montrent pas de rapport stable avec des mouvements dans quelque compte composant que ce soit.