Financial globalization, exchange rates, and international trade

By

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The global economy has undergone a quantum leap in the degree of integration of international financial markets since the early 1970s.[1] In large measure, this shift was the product of deliberate policy changes, such as the elimination of capital controls and the deregulation of domestic financial markets. In addition, dramatic improvements in international communications and information technology have contributed to the reduction of "natural" barriers to international financial transactions, as well as to the reduction of barriers to foreign direct investment and merchandise trade. International financial liberalization was accompanied by the abandonment of the Bretton Woods system of adjustable exchange rate pegs and the shift to floating exchange rates among the major currencies or regional currency blocs. Financial liberalization also followed upon an earlier (but still ongoing) process of multilateral trade liberalization, originally through the General Agreement on Trade and Tariffs (GATT) in the 1940s and later through the formation of the World Trade Organization (WTO) in 1994.

Virtually all mainstream international economists have supported trade liberalization; the vast majority (but with somewhat more dissent[2]) has favored the shift to open capital markets and flexible exchange rates. Nevertheless, the economics profession has been struggling to keep up with the unexpected consequences of these tectonic policy shifts ever since they were actually put into practice. International economists entered the brave new world of financial globalization and floating exchange rates with an analytical apparatus inherited from the past that ill equipped them to anticipate what that new world that they had promoted would actually be like. The chief characteristics of the new era—such as extreme volatility of exchange rates, persistent violations of purchasing power parity, chronic trade imbalances, repeated financial crises, and more internationally correlated business cycles (see International Monetary Fund 2001)—were not exactly what the advocates of the new order had expected or promised.

To be sure, international economists have been busy at work since the 1970s, developing new theoretical and econometric models to try to comprehend the realities of liberalized international finance and flexible exchange rates. From Dornbusch's (1976) pathbreaking model of exchange rate overshooting through the most recent work on self-fulfilling speculative attacks, bubbles, and panics (surveyed in Blecker 1999, Hallwood and MacDonald 2000), international economists have sought to explain the volatility of exchange rates that was not predicted by earlier generations of models. Repeated econometric tests have established certain "stylized facts" about the international financial system, such as the fairly robust findings that: covered interest parity holds between countries with liberalized capital flows, but uncovered interest parity and real interest parity do not; relative purchasing power parity is generally violated at least in the short and medium runs, and possibly even in the long run; no fundamentals-based model of exchange rates can predict their short-term movements consistently better than the assumption of a random walk; and current account imbalances have widened and grown more persistent since the 1980s (see Hallwood and MacDonald 2000, Blecker 1997, 1999, 2002).

Yet, in spite of these genuine intellectual advances, the basic analytical framework that most international economists use for many purposes remains stuck in the intellectual habits of the past. Core theoretical models of international economics (both micro-trade and macro-finance) continue to be based on assumptions that deny the new realities of globalized financial markets. Old ideas such as the law of comparative advantage, purchasing power parity, automatic balance of payments adjustment, and predictable exchange rates continue to serve as benchmarks for research, and dominate both pedagogy and policy advice. Advances at the frontiers of knowledge have not filtered back to change the basic models that most economists use to organize their thinking about the international economy (or to educate undergraduate

students). Like good Kuhnian researchers invested in a "normal" scientific research program, international economists are adept at analyzing and rationalizing the emerging anomalies that are inconsistent with their paradigm, but they cannot yet imagine a new overarching paradigm in which these phenomena would cease to be anomalous.

This chapter will attempt to demonstrate the extent to which the globalization of finance has undermined the dominant paradigm in international economics—and the policy implications that are usually drawn from that paradigm. The realities of the new era of globalized finance have not only created anomalies that were not anticipated by earlier theories, but have also undermined key assumptions of the regnant theoretical approaches. As a result, a large part of the conventional wisdom about both trade and financial policies rests on fundamentally flawed theoretical models. While a more positive alternative policy approach remains to be worked out, the argument in this chapter at least justifies resistance to the conventional free-trade and financial-liberalization policy agendas, and suggests directions for future research.

Before proceeding, two caveats are in order. First, nothing in this chapter should be construed as personal criticism of mainstream international economists, most of whom are busily pushing out the frontiers of knowledge in their respective specialties. The focus of this chapter is strictly on whether this research at the frontiers of knowledge is supporting, or rather undermining, certain core theoretical postulates of international trade and finance. Second, the discussion of comparative advantage theory in this chapter focuses on whether that theory can be maintained in an era of liberalized capital movements. Such a critique is not meant to be exclusive of other critical approaches to comparative advantage, for example, based on evolutionary approaches that challenge the comparative static methodology of that theory.

THE CLASSICAL APPROACH

The twin pillars of the classical approach to international economics are the notion of an automatic adjustment mechanism in the balance of payments and the theory of commodity trade as governed by the law of comparative advantage. These two propositions are not only related, but in fact constitute two sides of the same coin. An automatic adjustment mechanism—originally conceptualized along the lines of Hume's specie-flow story—is needed to guarantee balanced trade, which in turn is an essential assumption of the comparative advantage theory of trade. In the latter theory, commodity trade is essentially barter—goods are exchanged for other goods at relative prices (i.e., barter ratios) that equate the value of exports to the value of imports—and is completely independent of a country's international monetary and financial relations. This bifurcation of the field of international economics into real (trade) and monetary (finance) parts is, of course, just a specific case of the general proposition of monetary neutrality, in which "nominal" variables (such as money supplies and price levels—or exchange rates) have no effects on "real" variables (such as output and employment—or trade).[3]

Another key aspect of the classical view of trade is the deliberate neglect of international capital mobility—whether foreign direct investment in productive capital abroad, or portfolio investment in foreign financial assets. The assumption of capital immobility supports both the classical view of balance of payments adjustment and the classical theory of comparative advantage. On the one hand, in the absence of capital flows, the only counterpart to commodity trade is flows of international reserve assets (originally gold, later generalized to foreign exchange), and one could plausibly claim that such flows induce adjustments that would maintain balanced trade (e.g., the movements in price levels in Hume's specie-flow mechanism,

or interest rate changes in later models).[4] On the other hand, assuming that productive capital is internationally immobile implies that capital owners cannot invest abroad in pursuit of absolute competitive advantages (e.g., the lowest unit labor costs in labor-intensive assembly operations), and hence capitalist firms can find no more profitable outlets for their investment than the domestic sectors with comparative advantages (see Brewer 1985).

No one could credibly claim that these assumptions provide a realistic account of the contemporary global economy. Yet, models based on these assumptions continue to be taught to generations of students in college textbooks,[5] and remain the foundations for orthodox policy advice. The argument for free trade is usually stated in terms of the efficiency gains from specializing according to comparative advantages, along with some reassurance that (aside from a temporary adjustment period) no one ever loses a job due to imports because the economy tends to remain at full employment (or, at least, the level of employment is determined by factors other than the trade balance, such as central bank monetary policy). Complaints about low-wage labor (sometimes referred to as the "sweatshop labor argument") are routinely dismissed as illogical because, if trade follows comparative advantages à la Ricardo, relative wages merely track relative productivities, and no country can gain an *overall* competitive advantage in average *unit* labor costs (wages adjusted for productivity).[6]

Similarly, popular concerns over trade deficits causing job losses are often dismissed as unfounded because trade imbalances are held to be self-eliminating. For countries with fixed exchange rates, economists often cite an automatic balance of payments adjustment mechanism such as the Hume specie flow mechanism or a modern update thereof.[7] For countries with flexible exchange rates, the conventional story is even simpler: countries with trade deficits should have depreciating currencies that eliminate the deficits, and conversely surplus countries

should have appreciating currencies. Indeed, the belief that flexible exchange rates would provide such a simple way of ensuring balanced trade and thereby insulating countries from external demand shocks was one of the main arguments in favor of flexible rates before they were actually adopted in the early 1970s (see Dernburg 1989).

In the face of obvious evidence that exchange rates don't behave this way and that trade imbalances can persist, the argument sometimes shifts to the view that current account deficits that are offset by equal capital account surpluses are not a problem. In this view, countries that have chronic trade deficits for goods and services simply have a "comparative advantage" in selling their assets, or can be seen as exhibiting a preference for current consumption over future consumption in an intertemporal context. Since net capital inflows represent a "vote of confidence" in an economy, it is claimed, trade deficits are a sign of strength rather than weakness. This view was widely promoted by conservative U.S. economists in the late 1990s[8]—following earlier boasts of a similar nature by Mexican and Thai officials earlier in the decade, prior to their countries' currency collapses in 1994 and 1997, respectively.

Whatever the merits of these views, the fact that chronic trade imbalances sustained by persistent capital flows invalidate the traditional theory of comparative advantage for trade in goods and services seems to go unnoticed. If a country has a chronic trade deficit, it must be importing some goods and services in which domestic producers have a (static) comparative advantage.[9] Conversely, if a country has a chronic trade surplus, it must be exporting some goods and services in which it does *not* have a "true" comparative advantage. In such a situation, it is hard to maintain that the actual pattern of international specialization is guided by the law of comparative advantage, or that free trade policies necessarily result in goods being

exported by the relatively most efficient national producers. We shall return to this point below, after discussing the arguments for and against free mobility of capital.

ARGUMENTS FOR CAPITAL MARKET LIBERALIZATION[10]

Most fundamentally, support for the free international mobility of capital rests upon an intertemporal analogy to the classical argument for free trade in goods and services. Free trade in goods and services is supposed to maximize the efficiency of global production at any point in time, by enabling producers in each country to supply those commodities that they can produce with the relatively lowest costs (i.e., the goods and services in which they have a "comparative advantage"). International capital movements can be viewed analogously as involving the exchange of consumption over time: net lender countries are trading off current consumption for higher future consumption, while net borrower countries are able to increase their present consumption in exchange for future obligations to repay. Theoretically, this results in a more efficient intertemporal allocation of resources: "Where savers in one country have lesser preference for current consumption than those in another, total welfare is increased by shifting the consumption of one into the future and the other into the present" (Kindleberger 1967, quoted in Dufey and Giddy 1978, 193). Although it has not been widely discussed, such reallocations of intertemporal consumption must entail some sacrifices of static efficiency, if as stated earlier the borrower (deficit) countries must import some goods in which they have a static comparative advantage and the lender (surplus) countries must export some goods in which they have a static comparative disadvantage. Presumably, in a complete analysis one would have to show that the

dynamic gains outweigh the static losses, and any such proof could be vitiated by the inherent uncertainties surrounding the future gains from present sacrifices.

The allocative efficiency argument for liberalized capital flows can also be stated in terms of equilibrating international saving and investment. If the excess savings of some countries can freely flow to borrowers in other nations around the world, it is argued, then total world savings should supposedly find their most beneficial uses and the entire global economy should be more productive as a result. As Kindleberger (1967) wrote,

> The main justification for international capital movement is that it shifts savings from locations where they are abundant and cheap relative to investment opportunities to places where they are scarce and expensive. . . . Where capital is more productive in one country than another, it should be moved from the country where it is less to the country where it is more productive. (Quoted in Dufey and Giddy 1978, 193).

The analogy to free trade in goods and services should alert us to certain important qualifications to the case for free capital mobility. Even assuming the idealized conditions under which free trade brings aggregate efficiency benefits, the gains from trade generally come at the expense of three types of social costs: redistributional effects, adjustment costs, and negative externalities. Although these problems are widely acknowledged in regard to commodity trade, it is less often recognized that these same sorts of distributional and adjustment problems also arise as a result of international investment.

Redistributional effects occur when investment is shifted from a less profitable outlet in one country to a more profitable outlet abroad. While the investors (and those employed by the foreign capital in the host country) thus gain, those in the home country who would have benefited from the domestic investment (especially domestic workers) may be worse off than they would have been if the investment had been made at home, holding other factors constant (technically speaking, the workers' marginal productivity is reduced by the exit of capital from

their country). Adjustment costs can be felt if some workers in capital-exporting countries become unemployed (either temporarily or permanently), or become reemployed at lower wages, or require costly retraining to obtain new jobs. There can also be adjustment costs in capital-importing nations, if the foreign investment creates dislocations of workers or requires costly complements such as infrastructure and training. In addition, the allocative efficiency gains from capital mobility can be offset by negative externalities. For example, foreign capital may flow into projects that increase pollution or induce deforestation.

Theoretically, in a perfect capital market, the distributional losses to some should be more than compensated by the gains to others, so that there is a net social benefit, although (just as in commodity trade) there is no free-market mechanism that compels the winners to compensate the losers. Globalization critics claim that the winners are often rich and powerful multinational corporations (MNCs), while the losers are ordinary workers and citizens, thus implying negative distributional effects of capital mobility (see, e.g., Rodrik 1997, Palley 1998). Also in theory, adjustment costs should be offset by domestic social policies (so-called "safety nets"), rather than by restrictions on trade or capital flows. In reality, however, liberalization of either trade or capital flows is rarely made dependent on the adoption of adequate compensatory policies for either distributional effects or adjustment costs. Economic theory also suggests that the optimal response to "distortions" such as externalities is to use domestic taxes or subsidies, rather than restricting trade or capital flows (see Bhagwati, Panagariya, and Srinivasan 1998). Again, such ideal policy responses are rarely adopted in practice when trade or capital flows are liberalized.

However, even leaving distributional effects and adjustment costs aside, the analogy between free capital mobility and free trade breaks down because international investment is

plagued by intrinsic informational problems that are not found in trade in ordinary goods and services. As Keynes (1936) argued, investment decisions are necessarily based on purely subjective evaluations of the probabilities of future events, or even on mere feelings of optimism or pessimism about a country's future prospects (so-called "animal spirits"). Restating this point in terms of modern economic theory, Stiglitz (1998, p. 15) states that "Problems of incomplete information, incomplete markets, and incomplete contracts are all particularly severe in the financial sector, resulting in an equilibrium that is not even constrained Pareto efficient." These informational problems are compounded for international investment, because foreign investors generally have less information about a country's assets and their true future prospects than domestic investors are likely to have.

As a result of the intrinsic information problems in financial markets, these markets are often driven by "herd behavior" or self-fulfilling prophecies. When this occurs, asset prices can skyrocket in a "bubble" and subsequently collapse in a "panic," without regard to the underlying fundamentals that should theoretically determine the true value of the asset. Information problems can also give rise to the "contagion effects" seen in the spread of financial crises across Latin America, Asia, and other developing regions in the 1990s. Contagion occurs when a financial crisis breaks out in a country whose economic fundamentals, while not necessarily unproblematic, were not bad enough to generate a crisis on their own, due to a loss of confidence on the part of foreign investors who are spooked by a financial collapse in some *other* country. Whether they result from contagion or not, financial crises generally occur when investors turn relatively suddenly from being overly optimistic about a country's investment prospects (often ignoring fairly obvious warning signs) to being unduly pessimistic (and then ignoring the

country's intrinsic strengths). Unfortunately, this sort of instability appears to be endemic in liberalized capital markets (see Eatwell and Taylor 2000).

Calvo and Mendoza (1996) have analyzed why such information problems are likely to be especially severe when a large number of countries liberalize their capital markets at the same time. Their model recognizes that information is not a free good, and therefore investors need incentives to be induced to pay the costs of obtaining information. Since individual investors can reduce the overall risk of their portfolios by diversifying their investments across countries (assuming that country risks are uncorrelated), they have *less* incentives to seek information about the individual countries in which they invest when their portfolios are highly diversified internationally than they would have if they concentrated their investments in a smaller number of countries. Thus, international capital market integration makes "herd behavior" (and hence bubbles, crises, panics, and contagion) more likely to occur—and therefore potentially worsens the very risks that investors are trying to avoid through international diversification.

While such problems are generally recognized to exist in international financial markets today, the way in which they undermine the case for capital mobility is not always appreciated. Information problems do not merely create costs (e.g., greater volatility) that have to be weighed against the benefits of open capital markets. Rather, these problems also *undermine the presumption of net efficiency gains from free international mobility of capital*. In order for investors to invest in the places with the highest real returns to their capital, investors must have full information about the true economic returns to all available investment opportunities—or, at least, rationally determined expectations about the likely returns based on objectively known probabilities of possible future outcomes. If investors are not making such fully informed decisions based on objective criteria about countries' long-term prospects, there can be no

presumption that capital is flowing toward those countries where it will be most productively used. To the extent that investors follow self-fulfilling expectations about short-term trends and move their funds into and out of countries in herd-like fashion, the efficiency argument for free capital mobility is difficult to maintain.

Distributional problems are also relevant to understanding the flaws in the argument for capital mobility. To use an example, the mostly affluent Americans who went on a consumption binge in the late 1990s and early 2000s are probably not the same people (either by class or by generation) who will end up making the future sacrifices required in order to reduce the U.S. trade deficit. The notion that a whole country could be making such an informed choice about intertemporal allocation rests upon the fallacy of assuming a "representative agent," a fiction that does not correspond to the real world of heterogeneous agents with conflicting interests. Credulity is further strained when the representative agent has to consider the welfare of infinitely many future generations in order to formulate an intergenerationally optimal consumption and saving plan.

A more likely interpretation is that the shift to liberalized capital markets has been a response to political pressures from economic interests that stand to gain from such liberalization—particularly financial institutions and "Wall Street" investors who can profit off the volatility in global financial markets, as well as MNCs that want the freedom to move their funds internationally without restrictions. Although I have referred to them as "Wall Street" interests,[11] they are not limited to Americans; elites all around the world, in developing as well as developed nations, have an interest in open capital markets in which they can globally optimize their individual portfolios. Yet, the opening of capital markets can create severe negative

impacts for important segments of society, both in the present and the future, who have no effective voice in the international investment decisions that affect them.

Although more research is certainly needed, much as been learned already about the actual effects of capital market liberalization. Rodrik (1998) has shown that there is no correlation between capital market liberalization and growth rates across countries (after controlling for other variables that affect growth). An earlier study by Grilli and Milesi-Ferretti (1995) found some evidence for positive effects of capital account controls on growth rates, but negative effects of current account controls. The latter study also found that capital controls were associated with higher average inflation (suggesting that they allow for greater monetary policy autonomy) and lower real interest rates (suggesting that they can encourage domestic investment).

Although growth benefits of capital market liberalization are thus hard to find, costs in terms of increased economic volatility are easy to see. International flows of portfolio capital are notoriously procyclical: investors pour money into financial markets when economies are booming and then withdraw those funds precipitously in times of crisis, thus tending to exaggerate the boom-bust cycles.[12] This phenomenon has been observed in the repeated financial crises in emerging markets of the past decade, and shows no sign of abating. To be sure, some of these problems could be ameliorated through policy reforms such as greater transparency of financial institutions and the abandonment of indefensible exchange rate pegs. Nevertheless, the procyclical nature of capital flows is endemic as a result of the information problems and herd behavior discussed earlier.

CAPITAL MOBILITY AND EXCHANGE RATES

Although there has been a long debate about how to measure the extent of international capital mobility (see Blecker 1997), a consensus has formed on the criterion of the covered interest parity (CIP) condition, which in approximate terms is:

$$i = i^* + f \tag{1}$$

where i is the home interest rate, i^* is the foreign interest rate, and f is the forward discount on the home currency ($f = (F-S)/S$, where F is the forward exchange rate and S is the spot exchange rate, both defined in units of home currency per unit of foreign currency). This condition is expected to hold if financial markets are open enough to allow free covered interest arbitrage activity, and provided that the interest-yielding assets (usually, short-term government bonds or other money market instruments) are regarded as risk-free (especially, there is no fear of either default or the re-imposition of capital controls). This condition began to hold very tightly in the late 1970s and early 1980s in the major industrialized countries that liberalized their capital markets at that time, such as the United States, the former West Germany, Japan, and the United Kingdom (Frankel 1991). Subsequently, CIP began to hold fairly tightly in other industrialized countries and emerging market countries that opened up their capital markets in the late 1980s and early 1990s, except for periods of volatility in which risk premia became important.

CIP is an arbitrage condition between spot and forward exchange rates, but it is not a complete equilibrium condition for international asset markets. The (approximate) general condition for equalization of risk-adjusted expected rates of return to international portfolio investment is

$$i = i^* + \Delta s^e + r \tag{2}$$

where Δs^e is the expected rate of depreciation of the home currency (i.e., $\Delta s^e = (S^e - S)/S$, where S^e is the expected future spot exchange rate) and r is the risk premium on home bonds (or, if negative, on foreign bonds). Many theoretical models make the special assumption that domestic and foreign bonds are "perfect substitutes" in the sense that there is no country risk premium (i.e., $r = 0$), in which case (2) becomes the uncovered interest parity (UIP) condition: $i = i^* + \Delta s^e$. Although this formulation is theoretically appealing, most empirical tests of UIP have found that it does not hold (see Hallwood and MacDonald 2000, Blecker 2002). The reason usually given is that (apart from the intrinsic difficulties in measuring Δs^e)[13] r is typically non-zero, and there are significant and time-varying risk premia.

Equation (2) can be solved for the spot exchange rate that clears the international bond markets:

$$S = \frac{S^e}{(i - i^*) + (1 - r)} \tag{3}$$

Thus, S is a function of subjective expectations of the future spot rate and perceptions of risk, as well as the interest rate differential.[14] The subjective expectations and fears (i.e., the S^e and r terms) can be quite volatile and can dominate the policy "fundamentals" (the interest rates in this equation) in determining the short-run equilibrium level of S. An example of this is a self-fulfilling exchange rate bubble, in which a rising or falling S^e drives S to move in the same direction, often regardless of interest rate differentials. Another example is a financial panic, in which increased risk perceptions r cause an immediate rise in S (i.e., a depreciation).

Most conventional open economy macro models embody more simple-minded stories of exchange rate determination, however. Although these models often incorporate some version of equation (2), they usually make special assumptions under which exchange rates become stable

functions of some set of policy "fundamentals." The risks and expectations are either assumed away, or else treated in such a manner that they become predictable in terms of policy fundamentals.[15] There are three main types of fundamentals-based models of flexible exchange rates: Mundell-Fleming, portfolio balance, and the monetary approach. Although each of these presumes that exchange rates can be explained by some set of fundamentals, the three approaches disagree about what the fundamentals consist of.

Mundell (1963) and Fleming (1962) developed an open economy Keynesian IS-LM model incorporating a balance of payments (BP) equation. The simplest version assumes static exchange rate expectations and perfect substitutes (i.e., $\Delta s^e = r = 0$), which implies that domestic and foreign interest rates must be equalized ($i = i^*$) and leads to certain well-known results. For example, in a small country (which takes i^* as given) under perfect capital mobility with a flexible exchange rate, a fiscal expansion causes the home currency to appreciate (and is ineffective for stimulating output) while a monetary expansion causes the currency to depreciate (and stimulates output). More complex versions (e.g., incorporating exchange rate expectations or assuming large countries) yield more qualified results, but this core logic usually comes through (see Dornbusch 1980). In this analysis, the fundamentals are monetary and fiscal policies and the parameters of a standard IS-LM model (i.e., the various propensities and elasticities governing consumption, investment, imports, exports, and money demand).[16] Empirical support for this theory is weak, however.[17] A likely reason for the theory's empirical failure is that the focus on interest rate differentials ($i - i^*$) ignores possible offsetting effects due to changes in exchange rate expectations and/or risk premia.

The portfolio balance model, in contrast, assumes that domestic and foreign bonds are imperfect substitutes and allows home and foreign interest rates to differ. The model extends

Tobin's (1969) approach to portfolio allocation to an open economy setting, usually by assuming that domestic residents hold three assets (domestic money, a domestic bond, and a foreign bond).[18] Under standard assumptions (e.g., the demand for each asset is positively related to its own interest rate and inversely related to all other interest rates), a reduction in foreign bond holdings (as a result of a current account deficit, which implies a decrease in net foreign assets) causes the home currency to depreciate. This result implies a modern version of an automatic adjustment mechanism, since (under Marshall-Lerner assumptions) a depreciation would tend to eliminate the current account deficit. In portfolio balance, then, the fundamentals are similar to those in Mundell-Fleming (e.g., monetary and fiscal policies), but include a broader range of asset market clearing conditions beyond the simple money market equilibrium condition embodied in Mundell-Fleming. The portfolio balance model has fared poorly in econometric tests, however, which find that exchange rates do not generally adjust in the right direction (just as often, countries with current account deficits have appreciating currencies).[19]

The Mundell-Fleming and portfolio balance models are both of Keynesian inspiration. However, the model that has motivated most empirical studies of flexible exchange rate determination is the monetarist-inspired monetary approach. In the simplest version, the exchange rate obeys purchasing power parity ($S = P/P^*$, where P and P^* are the home and foreign price levels, respectively). Prices are flexible and are determined by the (exogenous) nominal money supply (M) and the demand for real balances (liquidity preference, L), using the standard formulation of money market equilibrium in which $M/P = L(i, Y)$, with $L_i < 0$ and $L_Y > 0$, where Y is exogenously given full-employment (real) output. Assuming that an analogous equation holds in the foreign country, the equilibrium exchange rate is solved for as follows:

$$S = \frac{M/M^*}{L(i,Y)/L^*(i^*,Y^*)} \tag{4}$$

In this basic version, international capital flows are ignored, and interest rates affect the exchange rate only through their effects on domestic money demand and the (flexible) price level—hence, the somewhat counterintuitive prediction that a higher domestic interest rate causes the home currency to depreciate (by lowering money demand and hence increasing the equilibrium price level).

This basic model can then be modified in various ways, such as by assuming that prices are sticky in the short run and the interest rate obeys UIP (a pair of assumptions that leads to Dornbusch-style overshooting in response to monetary "shocks"). UIP is incorporated by assuming special functional forms for money demand L and L^*, such that (4) can be written as follows (with lower-case letters used to represent natural logs, except for the interest rates)

$$s = (m - m^*) + k(y^* - y) + l(i - i^*) \qquad (4')$$

where k is a positive constant and $l' > 0$. When exchange rate expectations are introduced via UIP (i.e., assuming $i - i^* = \Delta s^e$), one obtains

$$s = (m - m^*) + k(y^* - y) + \lambda \Delta s^e . \qquad (4'')$$

If, in addition, the expected rate of depreciation Δs^e is assumed to be determined by rational expectations, then the current spot exchange rate s depends only on current "fundamentals" (money supplies and national incomes) and (rationally) expected future fundamentals. However, this result requires imposing a transversality condition to rule out speculative bubbles—which is tantamount to *assuming* the conclusion that only fundamentals matter rather than proving it.

In any version of the monetary approach, the fundamentals include exogenously given, supply-side-determined output levels as well as exogenously fixed money supplies. Fiscal policy does not enter directly into the monetary model, and aggregate demand does not matter (except possibly in the short run if prices are sticky). The policy emphasis is on money supplies, which

are assumed to be under the control of the monetary authorities. The monetary approach views the exchange rate as linked directly to the relative price of a country's goods and services, and only indirectly to the prices of its internationally traded assets (insofar as UIP is used to tie down the domestic interest rate, but the latter enters the model only through the money demand function). The monetary approach model is thus a strange choice as a benchmark model for theorizing about flexible exchange rates in an era of open capital markets, the popularity of which can only be explained by the historical coincidence that the switch to flexible exchange rates occurred at the same time that monetarism displaced Keynesianism as the leading macroeconomic approach in the early 1970s.

Exhaustive econometric tests have repeatedly demonstrated the poor predictive powers of the monetary approach, either in its simple version or with more bells and whistles (Frankel and Rose 1995). Coefficient estimates are extremely sensitive to sample selection (countries and time periods), fitted values are much less volatile than actual observations on exchange rates, and estimated models don't predict well out-of-sample. It has repeatedly been shown that a monetary approach model cannot generally predict short-term fluctuations in exchange rates better than the "naive" assumption of a random walk. The only exception is in hyperinflationary situations, in which changes in money supplies, price levels, and nominal exchange rates tend to be of similar orders of magnitude.

The purchasing power parity (PPP) assumption has also fared badly in most empirical tests (see Rogoff 1996). Absolute PPP (the "law of one price") is clearly false for most goods and services, except for a narrow range of heavily traded commodities such as gold. Relative PPP is routinely violated, because real exchange rates do not remain constant but tend to fluctuate widely and persistently over both short and medium time horizons (up to periods of

several decades).[20] Only in countries with hyperinflation do exchange rate changes approximate relative price increases, so that real exchange rates tend to remain relatively constant in the short run. Another exception concerns the interpretation of PPP as a long-run trend: some stationarity tests conducted over extremely long time horizons (e.g., periods of a century or more) support a long-run version of PPP, by showing that real exchange rates do not *persistently* drift away from their mean levels—at least for a few major currencies for which such long time series are available (Lothian and Taylor 1996). But such results are not necessarily robust (see, e.g., Rogoff 1996 on Argentina). Since deviations from relative PPP can persist for decades, this assumption would appear to be a weak foundation upon which to rest a theory of short-run exchange rate determination, and hence it should not be surprising that the monetary approach gives such poor predictions.[21]

Overall, fundamentals-based models of short-term movements in exchange rates have flunked the empirical test. None can consistently predict better than a random walk model.[22] Also, standard "fundamental" variables do not exhibit the degree of volatility that exchange rates have come to display under a floating rate regime, and it is difficult to believe (as the monetary approach model with rational expectations would require) that rapidly shifting expectations of future fundamentals could explain such volatility. Furthermore, there is no uniform agreement on what the fundamentals consist of. Thus, two leading international finance scholars have concluded that

> no model based on such standard fundamentals like money supplies, real income, interest rates, inflation rates and current account balances will ever succeed in explaining or predicting a high percentage of the variation in the exchange rate, at least at short- or medium-run frequencies. (Frankel and Rose 1995, pp. 1707-8)

More useful insights into the determinants of exchange rate fluctuations come from studies that have broken out of the mold of fundamentals-based modeling. Engel and Hamilton

(1990) found persistent, self-generating "long swings" in the U.S. dollar exchange rate, i.e., the dollar tends to drift in one direction for a sustained period of time rather than to just fluctuate randomly. Several studies have found evidence consistent with the hypothesis of rational speculative bubbles, although, by the nature of the phenomenon, no study can ever definitively "prove" a speculative bubble because "any test for bubbles is based upon a posited model of fundamentals" as an alternative hypothesis (Frankel and Rose 1995, pp. 1708-9). These results suggest that floating exchange rates are functions of their own past values and that they are inherently unpredictable.

In contrast to conventional (fundamentals-based) macro models of flexible exchange rates, what Frankel and Rose (1995, p. 1710) call the "market microstructure" approach to exchange market psychology has generated much insight into actual movements in exchange rates. Surveys of currency traders show that they tend to have destabilizing, extrapolative expectations at short time horizons, although they tend to exhibit stabilizing, regressive expectations at longer horizons. Survey evidence also supports the commonsensical view that exchange rate expectations are heterogeneous, and hence there is no unique expected future exchange rate (or rate of depreciation). Currency traders known as "chartists" use "technical analysis" that can lead to bandwagon effects, which impart sustained momentum to current trends in exchange rates (Frankel and Froot 1990).

The upshot is that a more promising approach to exchange rates would be what Frankel and Rose (1995, pp. 1719-20) call a theory of "endogenous speculative bubbles," in which bubbles (i.e., self-propagating movements) arise out of the short-run dynamics in the trading process itself, but eventually burst when they create macroeconomic disequilibria so severe as to force a realignment of expectations (so that fundamentals have some role in the long run, if only

to limit the extent to which exchange rates can drift away from their theoretical equilibrium levels). This view is consistent with the conclusion of Taylor (2002), reached via a different route,[23] that exchange rates should be treated as state variables rather than as market-clearing prices in open economy macro models. That is, at any given moment, the prevailing exchange rate (even if floating or "flexible") is given by its own past evolution. The exchange rate then changes or adjusts dynamically in response to various factors, including expectations about future exchange rates (speculative behavior), risk-adjusted interest rate differentials (arbitrage behavior), news about policy shifts or political events (which affect investor confidence and risk premia), and perceptions of whether current exchange rates are sustainable or unsustainable in relation to macroeconomic fundamentals (e.g., the magnitude of current account deficits). What the exchange rate does *not* do, in this view, is to adjust to "clear" the balance of payments at every instant of time.[24]

Although one could write down a dynamic function for $\dot{S} = dS/dt$ following these principles, there is no unique form for such a function, and the parameters or weights attached to the different variables would be likely to vary over time and across currencies. There could also be strong nonlinearities, e.g., the response of the exchange rate to a large current account deficit or international debt could be qualitatively different from the response to a small deficit or debt, possibly giving rise to unstable or chaotic behavior. Thus, while one can conduct interesting "what-if" dynamic exercises using this approach (i.e., by specifying a particular functional form for $\dot{S}$),[25] one should not expect to arrive at a new set of deterministic predictions about exchange rate responses to macro policies or other fundamentals based on this approach.

IMPLICATIONS FOR TRADE THEORY

Once it is accepted that exchange rates are unpredictable, don't follow fundamentals, and can deviate persistently from standard theoretical equilibrium levels (whether defined by PPP or by balanced trade), the classical dichotomy between the real/trade and monetary/financial sides of international economics breaks down. With no guarantee that exchange rates will tend toward levels that would maintain balanced trade, chronic trade imbalances are likely to emerge. Indeed, while current account imbalances (and the counterbalancing net capital flows) tended to be small in relation to GDP during the Bretton Woods era of pegged exchange rates and capital controls, at least for the industrialized countries, such imbalances have grown larger and more persistent in the post-1973 era of flexible rates and capital mobility (Blecker 1997, 2002). Since the 1980s, a pattern has emerged in which the United States runs chronically large deficits, Japan and certain other Asian countries run chronically large surpluses, and the European countries generally run somewhat smaller but also persistent surpluses. Most developing nations are normally net capital importers, and thus have trade deficits, except in the aftermath of financial crises in which capital inflows are cut off and balanced trade results from the collapse of domestic demand. Although few developing countries have persistent overall trade surpluses, some of them have had significant *bilateral* surpluses with the United States that have aggravated trade tensions (China, Mexico, and Taiwan are key examples).

These persistent trade imbalances reflect not only macroeconomic disequilibria, but microeconomic misallocation as well. Simply put, chronically imbalanced trade is not (and cannot be) comparative advantage trade. To see this point, consider the canonical version of the classical Ricardian trade model due to Dornbusch, Fischer, and Samuelson (DFS, 1977) depicted

in Figure 1. DFS assume a "continuum of commodities" z arrayed on the interval [0,1] in decreasing order of home comparative advantage. The labor cost of one unit of each commodity z is $a(z)$ at home and $a^*(z)$ abroad. Assuming that labor is the only input for simplicity, and defining the relative productivity of home labor in producing commodity z as $A(z) = a^*(z)/a(z)$, the home country has a comparative advantage in a good z if $A(z) > w = W/SW^*$, where w is the relative home wage (W and W^* are the home and foreign nominal wage rates, respectively).

[Insert Figure 1 about here]

To determine the equilibrium pattern of trade, DFS impose the classical assumptions of balanced trade and full employment. This is accomplished by assuming fixed labor supplies, L and L^*, and postulating demand functions of the worker-consumers for each commodity z. For convenience, DFS assume constant (and equal) shares of expenditures by all consumers on each commodity. Skipping the technicalities, this leads to the function

$$B\left(z, \frac{L^*}{L}\right) = \frac{f(z)}{1-f(z)} \frac{L^*}{L} \tag{5}$$

in which $f(z)$ is the fraction of income spent on home goods when commodity z is the borderline commodity between home exports and imports, and $B(\bullet)$ is upward-sloping as shown in Figure 1. A comparative advantage equilibrium with balanced trade and full employment is reached at the point where $A(z)$ and $B(z)$ intersect, which yields the equilibrium borderline commodity z_0 and relative wage w_0. The home country exports goods in the interval $[0, z_0)$ and imports goods in the interval $(z_0,1]$ (which country exports z_0 is arbitrary). In this equilibrium state, labor is allocated to the *relatively* most productive industries in each country.

This model of comparative advantage can be criticized on many grounds,[26] but we restrict ourselves here to issues related to the non-neutral impact of financial factors and capital mobility

on real trade relations. To begin with, suppose we drop the classical assumptions that labor must be fully employed and trade has to be balanced. Then we can no longer use equilibrium between $A(z)$ and $B(z)$ to determine the actual pattern of trade. Suppose instead (following post-Keynesian or structuralist theory) that nominal wages are determined by historical and institutional forces in each country, and do not adjust flexibly to "clear" labor markets.[27] Suppose also that the spot exchange rate S is determined by the kind of autonomous financial-sector dynamics discussed in the previous section, and does not adjust to maintain balanced trade. Under these conditions, the relative wage is fixed at a given level $\overline{w}$ at any point in time. Although $\overline{w}$ may change over time in accordance with changing conditions in labor and currency markets, $\overline{w}$ has no necessary tendency to converge to a level that would ensure balanced trade with full employment.

Depending on the given level of $\overline{w}$, a country may have either a trade surplus or a deficit. Using the $B(z)$ function as a benchmark for determining the (hypothetical) balanced trade-cum-full employment point,[28] there must be a range of goods in which trade does *not* follow comparative advantage. In the example shown in Figure 1, $\overline{w} > w_0$ and the actual borderline good is $\bar{z} = A^{-1}(\overline{w}) < z_0$, so that the home country has a trade deficit and imports goods in the interval $(\bar{z}, z_0)$ even though it has a comparative advantage in those goods and would export them if trade were balanced. If the country follows "free trade" policies, the industries that produce these goods will either shut down or operate at a loss, in spite of the fact that they are relatively efficient producers.

Thus, in a world characterized by financial liberalization and flexible exchange rates, trade liberalization does not necessarily lead to a globally efficient allocation of resources. Given institutional wage setting in each country, it would be necessary to have a managed

exchange rate policy in order to set the relative wage at the level (w_0) that would keep trade balanced and allow it to follow comparative advantage. Such an exchange rate policy would effectively equalize (trade-weighted) average unit labor costs across countries, so that no country could gain an overall or absolute competitive advantage. Ironically, in the absence of such an interventionist exchange rate policy, free trade will generally fail to deliver on its promise of promoting an efficient pattern of international specialization when capital markets are open.

The phenomenon of autonomous exchange rate movements driving trade balances into persistent disequilibrium has been nowhere more apparent than in the U.S. economy since the 1980s. As Figure 2 shows, there have been two major episodes of real dollar appreciation during this period, one in the early 1980s and another in the late 1990s and early 2000s. Each time, a soaring trade deficit has resulted, although the precise timing of the latter has varied depending on other factors (especially the state of the business cycle in the United States relative to its trading partners).[29] Each time, the corresponding net capital inflows not only financed the trade deficit, but also pushed the dollar to ever-rising heights. Large trade deficits were cited as reasons for the dollar's eventual fall in both 1985-87 and 2002-03, but those deficits were allowed to build up for several years before their negative impact on the dollar was eventually felt, and the immediate causes of the dollar's decline were policy interventions or financial market events that burst the speculative bubbles—not bad news on the trade front by itself.

[Insert Figure 2 about here]

While financial globalization tends to keep exchange rates misaligned and trade imbalanced, capital mobility in a broader sense—including foreign direct investment, technology transfer, and globalized production—can have positive feedback effects on the relative productivity locus $A(z)$ in the DFS Ricardian model. Although the original Ricardian model

assumed that the underlying labor coefficients $a(z)$ and $a^*(z)$ were based on indigenous technology and natural resources, in the modern world these coefficients are often the result of MNC operations in a "host" country or other means of technology transfer. Liberalized trade and finance (along with the revolutions in communications and transportation technology) encourage firms to locate their labor-intensive operations in relatively low-wage countries,[30] provided that minimal thresholds of property rights, infrastructure, and education, are met (but not minimal thresholds of labor rights or other social standards unrelated to private profitability).

As a result of these factors, local producers in the host country (some of which are MNC affiliates) are often able to produce with state-of-the-art production methods and close to industrial-country productivity levels in those industries.[31] This tends to pull the left-hand side of the $A(z)$ locus up, so that $A(z)$ shifts in an export-biased direction and the dividing commodity $\bar{z}$ increases to z' for any given $\overline{w}$ (as shown in Figure 3). Based on our previous arguments, $\overline{w}$ is unlikely to adjust in an offsetting direction in the absence of deliberate exchange rate management—or unless increased labor rights allow workers in the capital-importing country to win wage increases in step with their productivity gains.

[Insert Figure 3 about here]

This sort of technology transfer is a possible explanation of the chronic trade surpluses observed in bilateral trade between certain newly industrializing countries (e.g., China and Mexico) and the United States, if not globally. Such trade is driven by absolute competitive advantages in the sense of Brewer (1985)—i.e., the ability to combine relatively high productivity with relatively low wages—not by comparative advantages. Such trade offers increased profit margins for global companies, which can lower their unit labor costs substantially while still selling at high prices to industrial country consumers. However, not all

developing countries are likely to share in such competitive advantages. Countries with overvalued currencies (possibly resulting from excessive inflows of short-term financial capital) are less attractive investment outlets for MNCs, and will not obtain the requisite technology transfers. Thus, the skewed pattern of international capital flows can result in a new form of uneven development, in which a few developing countries enter a "virtuous circle" of rising productivity and successful exporting, while many others are caught in a "vicious circle" of stagnant productivity and disappointing exports.

Financial liberalization contributes to these transformations in international trade in several ways. First, as noted earlier, financial liberalization can prevent flexible exchanges rates from adjusting to balanced-trade equilibrium levels, thus perpetuating chronically imbalanced trade based on absolute cost advantages. Second, financial liberalization greatly facilitates the mobility of productive capital, technology, and "footloose production" around the globe, which in turn alters countries' international competitive positions. Finally, maintaining open capital markets gives foreign investors and MNCs an "exit option" that can put pressure on host countries to maintain social and economic conditions favorable to foreign capital (e.g., lax enforcement of labor rights and environmental standards, special tax breaks, etc.).[32]

A NOTE ON INTERNATIONAL ADJUSTMENT

The chronic trade imbalances due to misaligned real exchange rates (relative wages) and absolute competitive advantages discussed here *do* result in significant economic adjustments, but not necessarily of the type contemplated in orthodox models of flexible exchange rates. In the long run, what are more likely to adjust are the output levels or growth rates of the countries,

rather than the real exchange rates or relative wages and prices. This result has been repeatedly demonstrated by post-Keynesian economists utilizing the "balance of payments constrained growth" model pioneered by Thirlwall (1979).

Thirlwall's model implies that countries that would otherwise run chronic trade deficits are forced to slow their growth in order to limit those deficits to levels consistent with sustainable net capital inflows, while countries that would otherwise run chronic surpluses are permitted to increase their growth accordingly.[33] Although earlier econometric tests of this hypothesis have been criticized on various grounds, the most convincing new evidence comes from a recent paper by Alonso and Garcimartín (1998-99). These authors demonstrate econometrically that output levels adjust significantly to offset trade imbalances, while relative prices of exports and imports (which incorporate exchange rates) do not. In effect, this means that adjustment in a deficit country is normally achieved not by lowering the relative wage $?$, as implied by the classical model, but rather by reducing national income and economic growth in order to curb demand for the imported goods on the interval $(\bar{z}, 1]$. Thus, the real-world process of international adjustment is likely to foster unemployment, contrary to the classical postulate of full employment in a free-trade equilibrium.

What about the role of real exchange rate adjustment? There are really two parts to the orthodox view on this matter: (1) that real exchange rates should adjust in the right direction to offset trade imbalances, i.e., currencies should appreciate in surplus countries and depreciate in deficit countries; and (2) that these real exchange rate adjustments have significant effects in reducing the trade imbalances through their effects on the relative prices of exports and imports (assuming the Marshall-Lerner elasticities condition). In this author's view, part (1) of this argument is invalidated by what we have learned about the actual behavior of flexible exchange

rates in a world of globalized finance. Exchange rates that are governed by autonomous financial market dynamics and self-fulfilling speculative expectations do not generally move in directions that would help to balance trade. But these factors do not invalidate part (2) of the exchange rate adjustment story.

Although there are many well-known qualifications, real depreciations can and often do have significant positive effects on the trade balance while real appreciations have opposite effects, as Figure 2 (above) shows graphically for the United States. Of course, *nominal* depreciations may not necessarily lead to *real* depreciations, especially in developing countries where heavy dependence on imports can lead to inflationary repercussions that can nullify the competitive gains. Also, Marshall-Lerner elasticities vary across countries, implying that relative price (real exchange rate) effects are stronger in some countries than in others.[34] But the potential for real exchange rate changes to serve an equilibrating function (and possibly to serve as a substitute for the growth adjustments emphasized by Thirlwall) cannot be lightly dismissed; my argument is that such changes have to be steered by conscious exchange rate management, and will not automatically occur if exchange rates are simply allowed to float.[35]

POLICY CONCLUSIONS

The argument in this chapter suggests that large parts of conventional international economic theory, both in the trade and finance branches, need to be abandoned for inconsistency with the realities of globalized finance in today's world economy. Moreover, the separation of these two branches becomes problematic when there is no automatic adjustment mechanism for the trade balance, and hence the microeconomic pattern of trade is not independent of

macroeconomic policies, monetary factors, and financial behavior. Money is not neutral when nominal exchange rates determined by autonomous financial dynamics affect real trade flows and when these effects persist beyond a theoretical "short run."

This conclusion raises difficult issues for the formulation of economic policy in today's global economy. The conventional arguments for liberalization of both commodity trade and capital markets rest upon the very theories that I have argued here to be untenable. If countries follow "Washington Consensus" policies of trade and financial liberalization, those countries are exposing themselves to great risks of economic instability and worsened inequality without guaranteeing themselves the supposed efficiency gains from such policies. Chronically imbalanced trade also exacerbates trade disputes, such as the recent controversy over U.S. steel imports, and standard analyses of the "costs of protection" have little meaning when import prices are distorted by misaligned exchange rates.

This critique does not imply a justification for blanket protectionism or closed capital markets, but it does suggest that policy analysis should be refocused on the specific consequences of selective types of openness, particular forms of regulation, etc., rather than on all-or-nothing arguments about free-trade-versus-protection or financial-liberalization-versus-financial-repression. The optimal set of policies is likely to vary by country, rather than to come in a cookie-cutter model imported from Washington. And, ironically, one currently disfavored type of policy intervention—deliberate management of exchange rates—may be essential for fostering the conditions of balanced trade with full employment that are assumed in the conventional theories of mutually beneficial trade.

NOTES

[1] For background on financial globalization see Mussa and Goldstein (1993), Obstfeld (1998), Baldwin and Martin (1999), and Eatwell and Taylor (2000).

[2] See McKinnon (1988) and Hanke (1998) for arguments in support of fixed exchange rates (the latter author also favors currency boards), and Williamson and Miller (1987) for an influential proposal for managed rates (target zones). See Bhagwati (1998), Rodrik (1998), and Stiglitz (2002) for critiques of unregulated capital mobility.

[3] See Blecker (2003a) on the post-Keynesian critique of the trade-finance dichotomy. A closely related argument, which parallels many themes in the present chapter, is made by Palley (2003a).

[4] In the specie-flow story, a country with a trade surplus has a net inflow of gold (which could be modernized into foreign exchange reserves). Assuming no sterilization, the increased reserve assets (gold or foreign exchange) cause the money supply to increase, which (assuming the quantity theory of money) increases the price level. As the price level increases, the country's goods become less competitive (at a fixed exchange rate), and the trade surplus decreases until balanced trade is reached and reserve inflows cease. In a more Keynesian variant, inflows of monetary reserve assets cause the interest rate to fall, which stimulates investment demand. The rise in investment then boosts national income through the multiplier mechanism; higher national income then leads to increased import demand, which reduces the surplus until again balanced trade is reached. Both stories can be told in reverse for countries with initial trade deficits. See Robinson (1946-47) for a critique of automatic adjustment mechanisms.

[5] Krugman (1993) went so far as to argue that undergraduate students should only be taught the classical models of trade and the balance of payments.

[6] See Burtless et al. (1998) and Golub (2000) for the conventional view, and Larudee and Koechlin (1999) for a critical perspective. Of course, in the Ricardian trade model, relative wages must be lower than relative productivity in a country's export sectors and higher in import sectors, but this is merely the law of comparative advantage at work. See the discussion of the formalization of this model by Dornbusch, Fischer, and Samuelson (1977), below.

[7] See note 4, above.

[8] See Views of the Republican Commissioners in U.S. Trade Deficit Review Commission (2000), and the testimony of witnesses such as John Makin and Daniel Griswold (hearing of August 19, 1999), available on the Commission's website < www.ustdrc.gov>.

[9] A related point has been recognized in the literature on "shadow prices," which shows that inefficiencies can result when market exchange rates differ from their shadow (social equilibrium) levels (Schydlowsky 1984).

[10] This section draws on the more extensive discussion in Blecker (1999, pp. 10-37). Permission of the Economic Policy Institute to re-use this material is gratefully acknowledged.

[11] This usage follows Palley (1998); see also Bhagwati (1998) on the "Wall Street-Treasury complex."

[12] This point is emphasized by D'Arista (1996) and Eatwell and Taylor (2000), among others.

[13] Any econometric test of UIP is really a test of the joint hypothesis that UIP holds and that the postulated expectations process governing Δs^e (e.g., rational expectations) is correct.

[14] Equation (3) is clearly not a complete theory of exchange rate determination. First, the psychological processes governing exchange rate expectations and risk perceptions have to be modeled, as discussed below. Second, this condition applies only to short-term, money-market flows, and ignores other types of capital flows (see Marston 1995). This equation is presented simply to point out the importance of expectations and risk factors in determining exchange rates in liberalized capital markets, and also to indicate how capital market liberalization severs the link between the exchange rate and commodity trade (notice that the trade balance does not appear in this equation).

[15] For example, the Dornbusch (1976) model of exchange rate "overshooting" assumes that Δs^e is determined by monetary policies and currency traders' expectations that the spot exchange rate will return to its (correctly perceived) long-run equilibrium level (so-called "regressive expectations). This model is a special case of the monetary approach as discussed below.

[16] The traditional model assumes an exogenous money supply set by the central bank, i.e., the monetary authority targets a monetary aggregate. See Dornbusch (1980) for a classic exposition, and Romer (2002) for an alternative approach based on interest-rate targeting.

[17] The well-publicized case of the U.S. dollar appreciating following the Reagan fiscal expansion of the early 1980s appears to be an exception, not the rule. Bosworth (1993) found that the U.S. dollar exchange rate was unique in responding strongly to the home-foreign interest rate differential; most other currencies did not exhibit this behavior, or did so only weakly.

[18] This version is covered by Dernburg (1989) and Hallwood and MacDonald (2000), who attribute it to Branson (1977). See Branson and Henderson (1985) for various model extensions.

[19] Alonso and Garcimartín (1998-99) find that relative prices (real exchange rates) do not adjust significantly in response to trade imbalances, but output levels (growth rates) do. See the discussion of alternative views of the international adjustment process, below.

[20] Bleaney and Mizen (1996) found that real exchange rates of certain major currencies tend to remain within wide bands around their means, but this finding does not explain the persistent movements of exchange rates within those wide bands. This finding could be taken to support the notion of "endogenous speculative bubbles" discussed below.

[21] A heterodox explanation for persistent violations of PPP is given by Shaikh and Antonopoulos (1998), who show that long-run trends in real exchange rates for the United States and Japan approximate the trends in their relative real unit labor costs (i.e., real wages adjusted for productivity). Since relative real unit labor costs vary over time, this theory predicts that PPP should not generally hold in the long run. Rather, countries that are becoming relatively more competitive (because of relatively rapid productivity growth or slow real wage increases) should tend to have depreciating real exchange rates, and conversely countries that are becoming less competitive should have appreciating real exchange rates, resulting in chronic trade imbalances. Although this approach is both theoretically appealing and empirically promising, it has the

puzzling implication that the United States has become *more* competitive in the past few decades (because the dollar has a long-term falling tendency), while Japan has become *less* competitive (because the yen has a long-term rising tendency). This is contrary to most interpretations of U.S.-Japanese trade, which view the U.S. as the uncompetitive economy due to its chronic trade deficit with Japan.

[22] This is not to deny that some fundamentals-based econometric models can outperform a random walk model for some exchange rates in certain sample periods. However, no general fundamentals-based model gives robust predictions for most currencies at most times.

[23] According to Taylor's stock-flow accounting scheme (based partly on earlier work of Godley 1996), all asset markets should clear at any point in time through adjustments in interest rates and asset prices, at a given exchange rate. Taylor criticizes traditional models of exchange rates for incomplete accounting of stock-flow relationships and asset-market equilibrium conditions. When these are fully specified, Taylor argues, Mundell-Fleming becomes untenable because the BP equation cannot be used as an independent constraint or separate equilibrium condition to determine the exchange rate. The portfolio balance model is also untenable, in Taylor's view, because it is implausible for the exchange rate to adjust instantaneously when it has to be taken as given to determine a country's net foreign asset position.

[24] Following the arguments in the previous note, Taylor (2002) concludes that although a balance of payments equation can be *derived* from a completely specified stock-flow accounting scheme, such an equation has *no independent status* and must always hold if all asset markets clear and all flow equilibrium conditions hold (at a given exchange rate).

[25] See Taylor (2002) for some theoretical exercises of this nature, using the (admittedly unrealistic) assumption of UIP combined with myopic perfect foresight, i.e., the expected exchange rate equals the actual exchange rate. Even under these simplifying assumptions, interesting and unconventional dynamics (e.g., either stable or unstable cycles) can result.

[26] Leaving aside Heckscher-Ohlin conundrums about factor proportions, the Ricardian framework can be augmented by including "technology gap" goods, or products in which one country has an absolute technological superiority, along the lines suggested by Dosi, Pavitt, and Soete (1990). See also Milberg (1994, 1997) and Elmslie and Vieira (1999) for further discussion of absolute advantage and technological gap theories of trade.

[27] Even if wages respond to labor supply and demand conditions, most workers are typically employed in the production of nontraded goods and services, and hence wages are influenced by labor market conditions in those industries as well as in the traded goods and services sectors. Thus, even a "market-clearing" wage is not necessarily a trade-balancing wage.

[28] This is done for illustrative purposes only, since this function rests on strong assumptions, including identical homothetic preferences of consumers which are necessary to obtain constant expenditure shares. In a more complex model, one would have to take into account the distribution of income and the actual expenditure patterns of different classes of income earners.

[29] In the early 1980s, when the U.S. economy was depressed, the trade deficit lagged behind the rise in the dollar. In the late 1990s, when the U.S. economy was booming and the rest of the

world was stagnant, the trade deficit rose more than one would expect from the dollar's rise. See Blecker (2003b) and Palley (2003b) on the dollar's most recent overvaluation.

[30] See Feenstra (1998) on "vertical disintegration" and outsourcing, and Larudee and Koechlin (1999) on the role of MNCs in raising productivity in developing country export sectors.

[31] See, e.g., Shaiken (1990) on foreign automobile plants in Mexico.

[32] This is the so-called "race to the bottom," discussed by Palley (1998) among others.

[33] See McCombie and Thirlwall (1994) and McCombie (1997) for surveys of the theoretical literature and empirical studies, including extensions of the model that control for capital flows. See Blecker (1998) for a model that links the balance of payments constraint to relative wages, and which also compares post-Keynesian and neoclassical adjustment processes.

[34] Conventional studies such as Cline (1989) generally find price elasticities that satisfy the Marshall-Lerner condition. However, Alonso and Garcimartín's (1998-99) estimates using simultaneous equations suggest that Marshall-Lerner is violated in a number of countries.

[35] See Davidson (1996), Blecker (1999), and Grieve Smith (2001) for discussions of alternative proposals for managed exchange rates.

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Figure 1 Dornbusch-Fischer-Samuelson Ricardian trade model with a disequilibrium relative wage

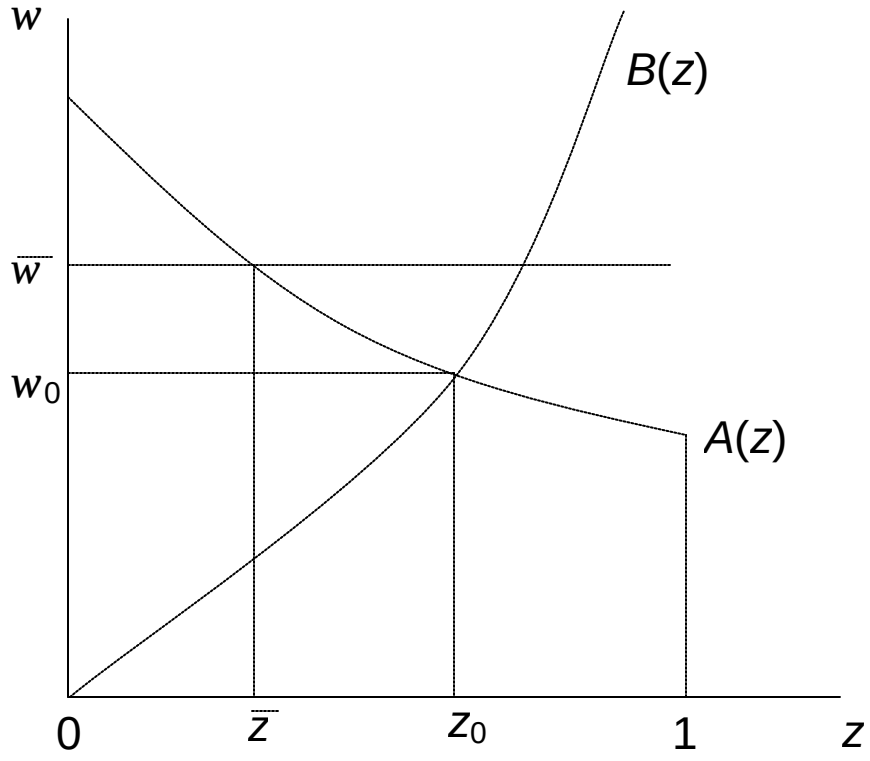
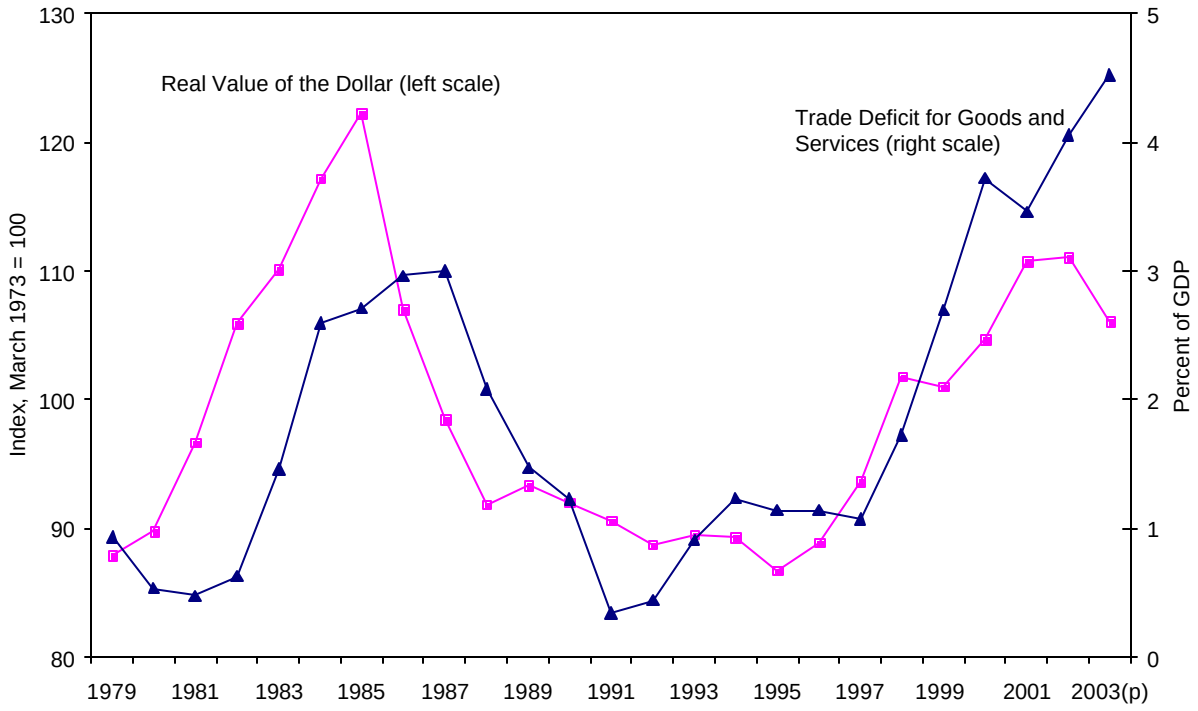


Figure 2 The real value of the dollar and the U.S. trade deficit, 1979-2003



Sources: U.S. Department of Commerce, Bureau of Economic Analysis, National Income and Product Accounts; Federal Reserve Board, Price-adjusted Broad Dollar Index; and author's calculations.
Notes:
(p) Data for 2003 are preliminary (first quarter for the trade deficit, first half for the dollar index).

Figure 3 An export-biased shift in the relative productivity curve