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REFERENCE RATES AND THE INTERNATIONAL MONETARY SYSTEM

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Preface

One of the perennial issues to have been considered in Institute research is the form that the exchange rate regime should take. Early in the 1980s John Williamson and I advocated a target zone system for the exchange rates of the principal currencies (see our joint chapter in William R. Cline, ed., *Trade Policy in the 1980s,* 1983). A little later Williamson explored the issue further in *The Exchange Rate System* (1985) and subsequently with Marcus Miller in *Targets and Indicators: A Blueprint for the International Coordination of Economic Policy* (1987). Subsequent works on the theme included Morris Goldstein's *The IMF and the Exchange Rate System: A Modest Proposal* (1995), Williamson's *The Crawling Band as an Exchange Rate Regime: Lessons from Chile, Colombia, and Israel* (1996) and *Exchange Rate Regimes for Emerging Markets: Reviving the Intermediate Option* (2000), and Morris Goldstein's *Managed Floating Plus* (2002). The bipolar approach to choice of an exchange rate regime was advocated by Barry Eichengreen in his treatment of the East Asian crisis, *Toward a New Financial Architecture: A Practical Post-Asia Agenda* (1999).

Williamson returns to the theme in this Policy Analysis. While the shift from "target zone" to "crawling band" in the 1990s was primarily semantic, although also acknowledging that the countries being addressed were primarily emerging markets rather than the main industrial economies, the solution discussed here is more fundamentally different. It still calls on countries to estimate equilibrium exchange rates and on the International Monetary Fund (IMF) to ratify or modify their choices. And it still seeks to commit countries to accept that they could profitably have a target value for their exchange rates. But it also accepts that the main industrial countries are at present unwilling to be pinned down to the defense of any exchange rate target and that their macroeconomic policy is committed to

pursuing internal targets like low inflation. The study argues that it would be possible to reconcile these facts by loosening the concept of exchange rate targeting that is pursued and adopting a reference rate—a rate that the authorities would be committed not to push the rate away from. The author lays out the benefits he sees in such an approach to restore at least a modicum of order and stability in the global exchange rate system and in the currency regimes of individual countries.

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The Institute's Board of Directors bears overall responsibilities for the Institute and gives general guidance and approval to its research program, including the identification of topics that are likely to become important over the medium run (one to three years) and that should be addressed by the Institute. The director, working closely with the staff and outside Advisory Committee, is responsible for the development of particular projects and makes the final decision to publish an individual study.

The Institute hopes that its studies and other activities will contribute to building a stronger foundation for international economic policy around the world. We invite readers of these publications to let us know how they think we can best accomplish this objective.

C. Fred Bergsten
Director
December 2006

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1

Introduction

Since 1973, the exchange rates of the major industrial countries have been floating against one another, except in isolated instances such as within the European Monetary System. In recent years the move toward floating exchange rates has gained strength, as an increasing number of emerging-market countries have also allowed their currencies to float. Another important recent trend in macroeconomic policy has been to base monetary policy on the pursuit of an inflation target. Some of the major central banks still have not formally adopted inflation targeting, but in practice the achievement of a low rate of inflation is such a high-priority objective of the United States Federal Reserve, the European Central Bank, and the Bank of Japan that formal commitment might not make much difference. These developments seem here to stay. Countries value the freedom of not having to defend an exchange rate objective, while inflation targeting has provided them with an alternative nominal anchor to the traditional one of a fixed exchange rate.

These developments have occurred in an international monetary system defined by the Second Amendment to the International Monetary Fund's Articles of Agreement (adopted in 1976 and formally entered into effect in 1978). This system is essentially a regime of laissez-faire. Anything goes. A nonsystem, as several economists termed the successor to Bretton Woods when it was first announced to the world. There are no rules, except the famous injunction not to "manipulate" exchange rates.[1] Countries may

1. Like the phrase "fundamental disequilibrium," this term has never been officially defined, and in practice it seems that the IMF tolerates anything. My colleague Morris Goldstein (in

float if they want to, or fix their currencies in terms of anything else they choose (except gold!), or run any intermediate regime they like, no matter if (like the adjustable peg) it has repeatedly proved a disaster in the past. They can run a quasi–currency board if they prefer, even if it promises to bring disaster to their people, and the IMF may underwrite their idiocy in the name of national sovereignty until the crisis hits.

The disadvantages of this regime are becoming ever more evident as the global imbalances grow larger with no sign of reversal, despite a clear enough intellectual understanding of what needs to be done to rein them in (see, for example, Cline 2005). The present arrangements not only lack any disciplines that might avoid the escalation of imbalances but also breed conflicts such as the threat of protectionist legislation by the US Congress aimed at China unless it appreciates the renminbi. One could surely wish for an international system that would pressure countries into seeking and adopting a set of policies that are consistent with a satisfactory global outcome and that would outlaw attempts by individual countries to bully others into acting in accordance with their desires. The recent growth of international imbalances is a predictable result of living in a world without much in the way of rules. It raises yet again the question of whether the set of rules to which countries are subject should be strengthened.

Such a set of rules could be designed in two quite different ways, without asking the impossible by demanding that countries forgo floating exchange rates and de jure or de facto inflation targeting. One set of rules would commit countries to freely floating exchange rates (although presumably allowing an exception for countries that firmly fix their exchange rates). The alternative would be to commit countries to managed floating, with the principles of management clearly enunciated and the parameters publicly announced. Such a commitment could be formulated in two ways. One would involve a commitment that any interventions (or other attempts to influence the exchange rate) should lean against the wind, whichever way the wind is blowing. The alternative would be an obligation that any intervention should be in the direction of a reference exchange rate. This policy analysis develops the latter proposal.

Chapter 2 presents the reference rate proposal and briefly recounts its historical origins. It also considers two other forms that rules might take—rules that would oblige countries to float freely and rules that would limit intervention to that which leans against the wind—and explains why I am not enthused by those proposals. Chapter 3 describes the advantages that I perceive in a reference rate system and considers such supposed disad-

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Truman 2006) offered a definition, which labels all protracted intervention in the same direction as "manipulation." This definition at least has the virtue of being specific. But unless one believes that intervention can quickly and reliably cure misalignments, so that a prolonged undervaluation like that of the euro in 2000–2003 need never recur, it would be a mistake to preclude repeated intervention in the same direction. This study suggests an alternative approach.

vantages as infringement of the ability to pursue an inflation target. Chapter 4 discusses issues that arise in choosing between three alternative versions of the reference rate proposal: the canonical version in which one is prohibited from pushing the rate away from the reference rate, a version that surrounds the reference rate by a band in which intervention can go either way, and an alternative version in which no intervention is allowed in a band around the reference rate. Chapter 5 pursues the most difficult issue the proposal raises: that of selecting and securing agreement on the set of rates to be used as reference rates. Chapter 6 argues the importance of publishing the reference rates and the analysis that underlies them. Chapter 7 discusses how the reference rate proposal might have altered the behavior of countries, and therefore the historical outcomes, in a number of the most difficult cases that have confronted the world economy in recent years (Japan in the 1990s; Thailand, Indonesia, Russia, Brazil, Turkey, and Argentina prior to their crises; and the global economy in the present decade). The concluding chapter traces circumstances in which a reference rate system might be adopted.

As pointed out in chapter 2, the term "reference rates" as used in this study originated in academic work soon after the move to floating in 1973. However, certain officials have used a similar term but with a somewhat different meaning in the interim, as does John Taylor (2007) in his recent book. Specifically, the Group of Seven adopted what looked rather like target zones in the Louvre Agreement in 1987, but they were called "reference ranges." John Taylor recounts on p. 289 of his book how he and Caio Koch-Weser from Germany were urged in 2003 by their Japanese colleague Zembei Mizoguchi to adopt a set of reference ranges (with a similar meaning) around reference rates between the dollar, the euro, and the yen. The proposal was of course rejected unceremoniously, as one would expect of doctrinal floaters like Taylor and Koch-Weser, but they used language suggested by the Louvre rather than in the sense used here, where half the point of calling something a reference rate is to emphasize that it is *not* surrounded by any sort of zone that might oblige intervention.

2

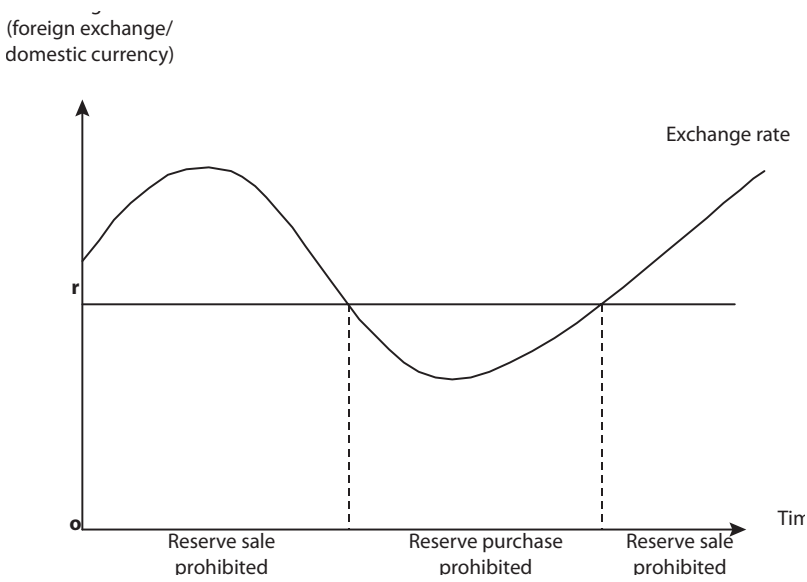
The Reference Rate Proposal

The reference rate proposal suggests that countries' authorities should be forbidden from intervening in order to push the exchange rate away, or at least much away, from what is termed the "reference rate." Wilfred Ethier and Arthur Bloomfield first developed this proposal in a conference paper presented in 1974, with the definitive version published as Ethier and Bloomfield (1975). They were concerned with developing a set of rules that would discipline countries' intervention policies in the brave new world of floating exchange rates that had just emerged. They suggested that two rules would suffice:

1. No central bank would be allowed to sell its own currency at a price below its reference rate by more than a certain percentage (possibly zero) or to buy its currency at a price exceeding its reference rate by more than the fixed percentage. This is the sole restriction imposed on central bank intervention.
2. The structure of reference rates would be revised at periodic prespecified intervals through some defined international procedure.

It is important to note that the proposal neither obligates nor prohibits intervention that would tend to push the exchange rate toward its reference rate. A country is entitled to allow its currency to float freely if it desires to do so, but it is also allowed to intervene, though if and only in a direction that one can assume is in accord with the perceived international interest. I say "one can assume" that it is consistent with the international interest because rule (2) specified that the reference rates are to be agreed

Figure 2.1 The reference rate rule (canonical version)



through "some defined international procedure." I turn later to the problems of how an agreed set of reference rates would be determined.

Operation of the Proposal

The operation of the reference rate proposal is illustrated in figure 2.1, which expresses the exchange rate Anglo-Saxon style as units of foreign exchange per unit of domestic currency (so that a devaluation reduces the exchange rate). Assume first that the "certain percentage" referred to in rule (1) above is indeed zero. Then the reference rate proposal would prohibit the purchase of reserves when the currency was weaker than its reference rate *r*, since that would tend to weaken the exchange rate still further and push it further away from the reference rate. Similarly, it would prohibit the sale of reserves when the currency was stronger than *r*, so that the country would be constrained from deliberately strengthening its currency further when that would be disequilibrating.

An important question Ethier and Bloomfield discuss in passing is the relevant concept of the exchange rate to use in defining reference rates. It is clear that one wants to define a reference rate in terms of the concept that is macroeconomically important. It is the effective rate, the average trade-weighted exchange rate against all trading partners, rather than the bilat-

eral exchange rate against any single other currency, that has an impact on macroeconomic stability, whether one thinks of inflation or demand (and thus unemployment). Reference rates should therefore be defined in terms of effective exchange rates. The nominal effective rates would need to be periodically adjusted by differential inflation to maintain rates constant in real terms.

Sterilized intervention in the foreign exchange market by buying or selling foreign exchange against the domestic currency is the most obvious way of managing the exchange rate. But it is not the only possible way, and one may also want to impose an international discipline on other forms of management. The most important of these other policies has traditionally been monetary policy. The question is whether the policy interest rate has been set appropriately for domestic objectives (such as achieving an inflation target or internal balance for a central bank that subscribes to a more Keynesian description of its policy objectives). If not, the presumption is that its deviation was attributable to an attempt to influence the exchange rate. One would then ask whether the deviation of the interest rate is consistent with the level of the exchange rate relative to its reference rate. For example, a country with interest rates lower than seem appropriate for domestic needs would be acting contrary to its international obligations if the exchange rate were weaker than its reference rate. On the other hand, a low interest rate (relative to domestic needs) would be internationally acceptable if the country also had a strong exchange rate (relative to the reference rate), because the interest rate would be tending to weaken the exchange rate, i.e., to shift it toward the reference rate.

Another policy that may be employed to influence the exchange rate has been around for a long time but has only recently received systematic notice or even a name. The policy is now called "oral intervention" (see Fratzscher 2004), perhaps more familiarly known as jawboning. It consists in the authorities expressing their opinions of where exchange rates ought to be. A familiar example is the habit of US treasury secretaries in recent years of averring their love for a strong dollar. Perhaps no one takes any notice, and so these declarations do no harm, but if they have an effect—and the evidence of Fratszcher is that they do—then they ought to be subject to the same sort of discipline as intervention. Under a reference rate system, it would be illegal to express support for a strong currency when the currency in question is stronger than its reference rate, or to try to weaken a currency by jawboning it down when it is already weaker than its reference rate.

A similar test should be applied to various other policies that have on occasion been used to influence exchange rates. Thus, a country with an exchange rate stronger than its reference rate should not increase export incentives, because that would tend to strengthen the domestic currency and thus drive it even further from its reference rate. Capital account policies can also affect the exchange rate, so a country with a weak exchange rate (relative to its reference rate) should not intensify controls on capital

imports or artificially promote capital exports. Either of those would be expected to weaken the capital account balance and depreciate the currency.

To summarize, a weak-currency country (as measured by the reference rate) should not

- accumulate reserves,
- hold the policy interest rate lower than is appropriate for domestic reasons,
- issue statements expressing support for a weaker currency,
- decrease encouragement of exports,
- intensify controls on capital imports, or
- artificially promote capital exports.

The rules for a strong-currency country would be symmetrical, except that it would be worthwhile to augment them so as to constrain a strong-currency country from borrowing in a foreign currency. A country with a strong currency (as measured by its reference rate) should not

- run down reserves,
- hold the policy interest rate higher than is appropriate for domestic reasons,
- express support for a strong currency,
- impose controls on current account expenditures except for non-economic reasons,[1]
- undertake sovereign borrowing in foreign currency,
- intensify subsidies to capital imports, or
- impose controls on capital exports.

Another issue on the design of a reference rate proposal merits discussion: What would happen if the IMF and a member country disagreed on what the latter's reference rate should be? My preferred approach would be to prevent such an issue from arising by requiring countries to accept the reference rate that the IMF's Executive Board ultimately decided. However, this approach could involve an unacceptable derogation of national sovereignty. A possible alternative would be to allow a country that failed to reach agreement on its reference rate to do as it pleased. This alternative hardly seems advisable, however, since it would amount to gutting the

1. Examples of legitimate controls would be controls on the import of firearms or drugs.

proposal: A country that wished to intervene despite a weak currency would simply have to refuse to accept a reasonable figure for its reference rate. Another possible alternative would be to forbid a country from intervening at all in the absence of an agreed reference rate. IMF surveillance would then be devoted to making sure that there was no intervention or resort to policies with similar effects. I assume in my analysis here that only a country that had a reference rate agreed by the IMF would be allowed to intervene.

It would be wrong to suggest that the introduction of reference rates is the only conceivable way of moving from the present nonsystem to an arrangement with well-specified rules. In fact, at least two other possibilities have already been discussed in the literature.

Free Floating

By far the best known would be to prohibit intervention and legislate the version of floating often held dear by economists—a system of freely floating exchange rates. At times some economists have worried about whether it is possible to have a pure system of floating rates, because the authorities normally have some of their own transactions in the foreign exchange market and the timing of these transactions might in principle influence the path of exchange rates. One might seek to counteract this concern by requiring that government purchases or sales of foreign exchange be spread out evenly over time and announced for several days or weeks in advance. However, such intervention is hardly likely to have a pronounced influence on exchange rates, and so the alternative is just to ignore it. A system that incorporated an obligation of free floating could simply allow both intervention designed to finance government transactions and smoothing intervention intended to minimize the impact of temporary blips without any intention of influencing the level of the rate. There would be a simple test of whether intervention was "nonsubstantive" (i.e., just aimed at smoothing the rate and financing government transactions), which is that the level of reserves should stay roughly constant over time (or at least increase no faster than can be accounted for by interest on the reserves or an announced trend buildup of reserves).

The disadvantage that some of us see in a system of floating exchange rates is that they give noisy signals of one of the most crucial macroeconomic prices, namely the exchange rate. The Meese and Rogoff (1983) finding that a random walk outperforms any economic model in predicting the exchange rate at short horizons, which has never been decisively overturned, is proof enough that the signal is a noisy one. If this noise were a question solely of short-run volatility, then one might overlook it, because while a few of the many studies devoted to examining the impact of exchange rate volatility on trade flows claim to have found a negative impact, the overwhelming

impression they leave is that any effects are small. But there are also misalignments, defined as large and persistent deviations of the exchange rate from some concept of equilibrium, which have also been large on occasion (as anyone familiar with the exchange markets is aware). Some of us have long felt that it is misalignments that constitute the major problem with floating. So long as the exchange rate between currencies whose value is left to the market (like the dollar and the euro) can vary by more than 50 percent in an era of price stability, there is a case for expecting governments to play a more active role in the foreign exchange market. It is not asking much of them to intervene in a way that will have a stabilizing impact.

The conventional model of the foreign exchange market that underlies the prescription of freely floating exchange rates assumes that the market is composed entirely of those who base their forecasts on fundamental considerations. But in fact the majority of foreign exchange traders use chartist techniques for forecasting exchange rates rather than fundamentalist ones. Paul De Grauwe and Marianna Grimaldi (2006) recently studied a "behavioral" model postulating that the market consists of both types of traders and that traders migrate from one group to the other depending on the profitability of their trading strategies. It turns out that such a model can explain the major ways in which the standard model is inconsistent with the facts:

- Exchange rates generally do not respond to changes in the underlying fundamentals.
- Exchange rates frequently (but unpredictably) follow bubble-and-crash dynamics.
- Chartism is a persistently profitable trading strategy in the foreign exchange market.
- Exchange rate changes exhibit fat tails rather than following a normal distribution.

It is difficult to understand how anyone who accepts that these facts apply to freely floating rates can feel happy with such a system. Dysfunctional instability is excessive. One alternative is the current system, in which intervention is purely ad hoc. Some exchange rates (like that between the dollar and the euro) float fairly freely, others (like that between the dollar and the yuan) are pegged (albeit nowadays with periodic small changes in the peg), others (like that between the US and Hong Kong dollars) are firmly fixed, and still others (like that between the dollar and the won) are at times allowed to float and at other times are heavily influenced by intervention. It is a historical fact that this "system" has spawned a buildup of global imbalances. If one worries about this buildup, it is natural to ask whether a rules-based system might not be able to do better. Almost by definition, such a system requires a set of management rules that can be codified.

Leaning Against the Wind

How might such rules be specified under floating? One way is through the reference rate proposal. An alternative was suggested many years ago by Paul Wonnacott (1958), as a formalization of Canadian policy when the Canadian dollar was floating in the 1950s. He suggested that countries should be allowed to intervene in order to resist the *trend* of the exchange rate. Thus a country could legally intervene in order to buy reserves if and only if its currency were appreciating, to slow but not reverse the movement. Similarly, a country with a depreciating currency could legally intervene in order to sell but not to buy reserves. Such a rule could be extended in order to cover the other ways of managing the exchange rate that were discussed above.

This rule would be relatively difficult to police, since it would require the policeman (presumably the IMF) to inform itself of the precise dates and times of intervention and whether the exchange rate was appreciating or depreciating at the time of intervention. But this rule has a far more important problem: It makes little sense if misalignments occur.[2] In that case a depreciation may be a benign movement back toward equilibrium, which one might want to encourage, rather than the presumptive move away from equilibrium that it would make sense to resist, as permitted by the Wonnacott rules. The only way to decide whether a move is toward equilibrium, and should therefore be encouraged, or away from equilibrium, and should therefore be resisted, is to estimate equilibrium rates. That naturally takes us to the reference rate system.

2. It should be noted, however, that De Grauwe and Grimaldi (2006, chapter 9) found that this intervention rule "worked," in the sense of precluding bubbles and crashes.

3

Advantages and Disadvantages of a Reference Rate System

At least three advantages stem from the introduction of a reference rate system. First, it could help the authorities of an individual country that wished to manage its exchange rate to avoid large misalignments. Second, it could help the private sector form more dependable expectations of future exchange rates and thus manage their businesses more efficiently in a world of floating exchange rates. Third, it could help the IMF design and manage an effective system of multilateral surveillance, with the presumption that the world economy would function better as a result and that there would be less chance of the global imbalances ending suddenly in a way that leads to a world recession. These potential advantages will be discussed in turn.

Exchange Rate Management

Why should a reference rate system be expected to help exchange rate management by an individual country? Suppose that we are talking of a country that wishes to stabilize its exchange rate at a level that the IMF names as the reference rate. There seems to be wide agreement, extending even to some economists who are skeptical of the potency of intervention,[1] that concerted intervention by both parties to an exchange rate (e.g., the

1. The authors of the Jurgensen Report (1983) reached this conclusion. It was reinforced by the seminal work of Dominguez and Frankel (1993) and accepted by both Sarno and Taylor (2001) and Truman (2003).

Bank of Japan and the Fed in the case of the yen-dollar rate) is likely to be more effective than unilateral intervention by one party alone. This finding is believed to be true even if the sum placed in the exchange market is the same. The obvious explanation for this finding is that the views of the authorities involved influence the participants in the exchange market. If it is the views of the authorities that carry weight rather than the portfolio balance effects of the transactions, then presumably multilateral endorsement of a target for the exchange rate, such as would be provided by the naming of a reference rate, would be more effective than bilateral concertation, let alone any national announcement. If that is so, having a reference rate could be expected to make what Fratzscher (2004) has termed "oral intervention" (a.k.a. jawboning) a more effective policy instrument than it would otherwise be.

Some economists might still want to ask why a country with a floating rate should be concerned about the exchange rate. Presumably a country floats the exchange rate only after it has adopted some alternative nominal anchor (such as a target for the rate of inflation), so shouldn't it be indifferent to the value of its exchange rate? If one believes that the *only* purpose of an exchange rate commitment is to anchor the price level, then there is no point in targeting the exchange rate once another anchor is in place. But some recognize that the (real) exchange rate also has an important allocative role, in determining the size of the tradable goods sector and the competitiveness of exports and import substitutes. One of the potential disadvantages of floating is that capital inflow surges may lead to the exchange rate giving false signals that may undesirably curb the size of the tradable goods sector. The advantage of having the ability to influence the exchange rate lies in the power to limit such false signals. A reference rate system that enhanced the ability to influence the exchange rate by oral intervention would curb the danger of a floating rate generating misalignments that give false signals. (Obviously that assumes some minimal ability to choose a sensible reference rate on the part of the authorities.)

Private-Sector Expectations

A second potential advantage of a reference rate system is in providing the private sector with expectations of (real) exchange rates likely in the longer run. At present the private sector seems to have no reasonably firm long-term expectations at all. Forward rates track current spot rates, being separated merely by the interest differential. Even when rates go to seriously misaligned levels, the private sector appears to see no arbitrage opportunity created by the prospect of a rebound.

This lack of firm long-term beliefs arises because exchange markets are in large measure driven by herd behavior rather than fundamentalist

expectations. The best-documented case is that of the dollar bubble of the mid-1980s. Note that labeling this a bubble is not being wise after the event: Paul Krugman (1985) and Stephen Marris (1985) both used economic analysis to demonstrate decisively ex ante that the dollar was overvalued. Jeffrey Frankel and Kenneth Froot (1986, 1987) showed how the dollar bubble led portfolio managers to place overwhelming weight on "technical" (i.e., chartist) forecasts, with "fundamental" (i.e., economic) factors being essentially dismissed because of their repeated error over the preceding years in forecasting the reversal of the dollar's rise. This dismissal in turn supported the dollar's continuing levitation until the authorities realized that something had to be done to restore the dollar to a level consistent with the fundamentals. Some of us can still recall encountering rank disbelief on Wall Street before the Plaza Agreement when we explained that the dollar's overvaluation would have to be corrected sooner or later.

Subsequent events do not suggest that the dollar bubble was a one-off event or that the markets have now learned the error of their ways. The yen's great roller coaster was the principal event among the industrial-country currencies during the 1990s: Practically everyone knew that the yen was overvalued long before it reached 80 yen to the dollar, yet it continued to that mark. The overshooting of the East Asian currencies (including the yen) in the second half of 1987 was even greater: While one can understand the extreme weakness of the Indonesian rupiah as a result of capital flight driven by fears about the political succession, no similar explanation is available for the other currencies of the region. There was instead an obvious and extreme lack of the sort of stabilizing speculation that theory says one has to rely on to stabilize a floating exchange rate (McKinnon 1979). Any hopes that these experiences would not be repeated were laid to rest early in the present decade by the overvaluation of the US dollar and the weakness of the euro.

Empirical evidence on floating exchange rates confirms the suspicion that these anecdotes arouse about the behavior of the foreign exchange market. For a while this empirical evidence suggested that exchange rates show no tendency to revert to equilibrium but rather that they follow a random walk. It is still true that a random walk outperforms any of the structural models of exchange rate determination for time horizons of less than a year, but there is now pretty conclusive evidence that a floating exchange rate will tend to revert slowly toward relative purchasing power parity (PPP), with half the adjustment being completed in under five years (Rogoff 1996). However, evidence also exists to support the theoretical presumption that the equilibrium real exchange rate can change, rather than being a permanent constant as the PPP model assumes (see the papers in Williamson 1994). One can reconcile this with the empirical success of the long-run relative PPP model if random deviations from equilibrium tend to be large relative to changes in the equilibrium real exchange rate. Reflecting this near-random walk behavior of a floating exchange rate, a change in

the spot exchange rate is normally associated with an almost identical change in the forward rate (Svensson 1992, 132), signifying that there is a virtually complete lack of any market expectation that the exchange rate will revert toward an equilibrium level within any time horizon relevant to market participants.

Frankel and Andrew Rose (1994, 35) argue that matters may be even worse. They acknowledge the previous finding "that investors tended to react to current appreciations by expecting future depreciations, consistent with either regressive expectations, adaptive expectations, or distributed-lag expectations, at time horizons of one year, six months, or three months" (Frankel and Froot 1987). This suggested that expectations appeared to be stabilizing. However, Frankel and Rose (1994) go on to argue:

> Subsequent studies . . . indicated that investors at shorter horizons of one week to one month tend to extrapolate recent trends. . . . Expectations at these short horizons appear to be destabilizing. Since most trading in the foreign exchange market is known to consist of taking and unwinding positions at horizons measured in hours rather than months or years, these findings have potentially serious implications.

The stylized fact, however, is that a change in the spot rate is normally matched by an equal change in the forward rate under floating. This fact implies that the net impact of all expectations, long as well as short term, is typically neutral rather than destabilizing.

Many economists have been puzzled by the evidence that the market can disregard long-run fundamentals, for it raises the problem first posed by Milton Friedman (1953) of how profits can be made from speculation that tends to destabilize the market. The most intellectually satisfying answer to this question is that offered by Krugman and Marcus Miller (1993), who postulate that, in addition to traders who wish to settle their current account transactions, the market contains speculators who behave like chartists in following the market and stop-loss traders who invest abroad and choose to cover their foreign exchange exposure against abnormally large losses. The way they do this is to place stop-loss orders at a rate that limits the maximum loss they may make. This involves their selling the foreign currency in which they have invested when it is extremely weak and buying their home currency when it is strong, which thus creates the possibility for speculators who have collectively driven a currency down to an unrealistically low value to buy that currency back from the stop-loss traders at a particularly cheap rate. In effect, the stop-loss traders buy insurance, and the speculators provide the insurance and take the profits.

Matters may be different in the presence of an exchange rate band. While bands do not normally have full credibility, and while they sometimes lack any credibility at all, the evidence shows conclusively that when a rate moves within a band, the forward rate normally changes by less than

the spot rate, indicating that the market expects that the spot rate will tend to revert toward the center of the band (Svensson 1992, 132–33). In other words, except where the band has become clearly unrealistic, a band performs the function of crystallizing market expectations of where the equilibrium rate lies and thus makes expectations stabilizing at the time horizons relevant for influencing market behavior. This function of a band is the fundamental reason for preferring a band system rather than allowing the exchange rate to float.

It has sometimes been asserted that the claim that a band can crystallize market expectations was refuted in Maurice Obstfeld's well-known paper on international currency experience. Obstfeld (1995) said:

> One drawback of target zones is that they may not exert a stabilizing effect unless markets are confident that their edges will be defended successfully. The difficulties in defending rigidly fixed exchange rates, however, apply fully to the edges of target zones, as was illustrated in March 1995 by the Spanish peseta's crash out of a band much wider than most proponents of target zones advocate. If markets can figure out the fragility of the edges and perform the requisite backward induction, a target zone loses much of its stabilizing power. It may even become destabilizing.

Now it is not true that full credibility is necessary for a target zone to exert a stabilizing effect: It is well established that partial credibility means that the stabilizing impact of the target zone is attenuated but that it still exists (Krugman 1991; see also the discussion in Williamson 1996, 8–9). The fact cited above, that a movement of the spot rate within a band is normally accompanied by a smaller movement in the forward rate while there is no such tendency with a floating rate, is conclusive proof that a band typically works as it is meant to in stabilizing market expectations. To counter this well-documented fact, an anecdote is offered, about the Spanish peseta in March 1995. I have never understood why the Spanish authorities did not make more effort to defend the peseta at that time, any more than I can understand why the Indonesian authorities did not make an effort to defend the rupiah in August 1997 comparable to that the Brazilians made when they faced a similar attack three months later. But even if the Spanish authorities indeed had no alternative, in the way that Obstfeld implies, it is a sad reflection on the profession's standards of evidence if one anecdote is deemed to outweigh a well-documented finding such as that cited above.

To improve on the obviously unsatisfactory present situation, it would be necessary for the set of reference rates to be reasonably good estimates of equilibrium exchange rates, i.e., of where rates can be expected to gravitate to in the longer term. The art of estimating is doubtless very imperfect, but it is surely not so bad that it would be impossible to generate useful estimates if adequate effort were invested in the task. Even then one could not be sure that the private sector would trust the figures enough to use them, at

least in the first instance. Only as and to the extent that the estimating effort built a track record that commands respect could one expect the private sector to start using the estimates. If and when that happened, the results would be highly beneficial, especially in terms of investment and sourcing decisions. One would hope that insuring against the risk of exchange rate changes would cease to be a dominant motive for the location of investments, as it reputedly is now.

Multilateral Surveillance

A third potential advantage of a reference rate system is in providing the IMF with a meaningful basis for multilateral surveillance, with the object of improving global macroeconomic performance. The mere fact that a country would need to have a reference rate endorsed by the international community as a condition for intervening would introduce a degree of international influence on a country's policies that is currently absent. Most historical examples of policy coordination have used an exchange rate commitment as the fulcrum on which to persuade countries to change their policies in order to secure international consistency.

The surveillance process would examine a country's policies for consistency with achieving the reference rate. It would be straightforward to examine whether a country's reserves have increased or decreased and whether the exchange rate was stronger or weaker than the reference rate. Other ways of influencing exchange rates such as interest rates, trade restrictions, or capital flow regulations might also be covered, as described before.

Everyone knows that exchange rates are only half the story of what drives current account balances. Surveillance also requires an evaluation of whether demand-management policy is appropriate. At the moment, no clear criterion exists as to whether a country is pursuing excessively contractionary or expansionary policies; as long as policies are not resulting in recession or inflation in that particular country, the IMF has no basis to complain, even if the set of policies being pursued by all its member countries is collectively inconsistent with a satisfactory global outcome. Adoption of the reference rate proposal would replace this situation with a criterion that is in principle well defined and is consistent with an acceptable global outcome. A country would be judged guilty of excessively expansionary policies if its level of domestic demand exceeded the sum of potential output plus its equilibrium current account deficit, even if an appreciation of its exchange rate above the reference rate were masking the inflationary potential inherent in this situation. Conversely, a country would be judged to have deficient demand if its domestic demand were less than its productive potential by more than its equilibrium current account surplus, even if this shortfall were being masked by a depreciation

of its exchange rate below its reference rate and an enlarged current account surplus.[2]

Who would supervise these rules, and what would happen if they were violated? In the first instance, the IMF staff might draw up regular reports (monthly or quarterly) about which countries were intervening inappropriately or otherwise violating these rules. Their reports would go to the IMF Executive Board. The executive director of a country held to be violating the rules would presumably give reasons as to why the country's actions should be excused. The Board might declare itself impressed, in which case the country's actions would be excused. Otherwise, the Board would implicitly call on the country to cease and desist. Some form of sanctions, such as suspension of IMF voting rights, might be applied to a country that flagrantly disregards surveillance. Of course, any sanctions should be applied multilaterally and not unilaterally, and supporters of liberal trade will wish to see them take some form other than trade sanctions.

Why should member countries take note of Fund advice structured along these lines when it is well known that they largely ignore the Fund's advice in its current surveillance operations? The answer is not about sanctions, but basically: because the Fund would be drawing on a body of analysis that is not available to individual member countries. Without the reference rates and the background of a consistent global picture, the IMF offers nothing more than the countries can figure out for themselves, because it is offering an analysis that draws exclusively on countries' own situations. Since all the major member countries have many more trained economists available than the IMF can deploy on any one country, it is rational to take little note of what the Fund says. This situation changes fundamentally if the Fund is drawing on a body of analysis of what is needed to produce a globally consistent outcome—because that analysis is not available to individual countries.

The other reason that countries might be willing to take note of Fund advice is that it would be part of the bargain needed to introduce a significant modification of the laissez-faire international monetary system. Countries understand that their partners can be constrained from adopting beggar-my-neighbor policies only if they are willing to be constrained themselves. Heeding Fund advice is the form that this constraint would take.

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2. There is a problem with this criterion: A country with an exchange rate that is undervalued by the market might be subject to inflation if the country bowed to IMF advice and expanded demand. (Similarly, a country whose exchange rate is overvalued by the market, as judged by the reference rate calculations endorsed by the IMF, could be pushed into deflating demand and recession.) The IMF would need to be aware of this potential difficulty but could sidestep it by requesting only modest policy adjustments. However, those policy adjustments would result in the ex ante creation of demand conditions that would support payments adjustment as and when the market recognized reality and moved the exchange rate toward the reference rate.

Inflation Targeting

It has been claimed that a disadvantage of a reference rate system is that it would undermine inflation targeting, and that this is a superior system (see the interview with Rodrigo de Rato in the *Financial Times,* January 28, 2006). I am not going to argue that reference rates offer a superior system to inflation targeting. Nor do I believe that they offer an inferior system. The two are simply different, and compatible.

Inflation targeting offers a rule for managing the domestic economy. A correct comparator would be the Keynesian proposal that macro policy should be directed at "internal balance" or a full employment target. One may argue that inflation targeting would be better than a Keynesian rule, because it offers a nominal anchor that would preemptively prevent an acceleration of inflation as well as an efficient way to do what monetary policy can to preserve high employment (e.g., Bean 1998), or that it would be worse, because it ignores the importance of maintaining high employment. Inflation targeting may be better or worse than a more Keynesian approach, but it is undeniable that one must choose between them.

However, one does not have to choose between inflation targeting and reference rates. One can perfectly well have a central bank that regards its main mission in life as the pursuit of an inflation target but that also adopts (or has thrust upon it) a reference rate for the value of its currency. Unlike a traditional central rate, whose defense can force a country to intervene and may thus require it to alter its monetary policy, which indeed may threaten its inflation target, a reference rate only prohibits actions to increase the distance of market exchange rates from the reference rate. Since it imposes no *obligation* to act, a reference rate cannot be in conflict with an inflation target.

No Impact

Another criticism of the reference rate proposal is that it involves such a weak commitment that it would in practice change nothing. But if one believes that sterilized intervention may influence market exchange rates, then disciplining the potential to intervene, via a reference rate, must be capable of affecting exchange rates. And if one believes that one of the channels through which intervention works is by influencing the expectations of market participants, then an agreed reference rate must also be capable of influencing exchange rates indirectly. If one accepts the evidence that this impact is stronger when the authorities of different countries agree (as shown by international concertation of intervention), then international agreement on a reference exchange rate can be expected to have a bigger impact on exchange rates than would unilateral intervention. To this impact on current exchange rates one must add any change in private-sector behavior as businesspeople

come to feel that they have more basis for predicting where exchange rates are likely to be in the longer term, plus any change in government behavior that results from a more robust system of surveillance.

These are not necessarily second-order channels. It is true that the economics profession is still divided on the question as to whether sterilized intervention in the foreign exchange market is a worthwhile policy instrument. Skeptics include Schwartz (2000) and Edison (1993), but against them are Sarno and Taylor (2001) and Dominguez and Frankel (1993). My own view is closest to that of Kubelec (2004), who presented empirical evidence in support of his thesis that intervention is more effective when there is a large misalignment that needs curbing. The intuition is that markets sometimes go off on errant paths but that they may be pushed back toward reality by a determined act of the authorities. A central bank that tries to defend a disequilibrium exchange rate will be run over by the market, whereas one that intervenes when it is the market that has established a disequilibrium rate is far more likely to have an impact. It is debatable whether the impact of such intervention should be counted as long lasting. If one believes that exchange rates have a tendency to revert toward equilibrium in the long run, then one would neither expect nor want intervention to have an effect in that long run. The function of intervention is to lessen the size and length of misalignments, not to influence the long-run average exchange rate.[3]

As noted before, Fratzscher (2004) argued that one should really be thinking of intervention as comprising two instruments rather than one: buying and selling foreign exchange, which is the usual interpretation of intervention, and also what he calls "oral intervention." Oral intervention, a.k.a. jawboning, involves telling the market things like what the authorities believe the equilibrium rate to be (or what they think a disequilibrium rate is). One might expect that oral intervention would become increasingly effective if and as the authorities establish a track record of naming plausible estimates of equilibrium exchange rates. The fact that for long periods the exchange rates in the European Monetary System held together with no intervention suggests that this mechanism can be powerful as confidence builds up.

Similarly, it would be an error to dismiss the possibility that an effective system of policy coordination might emerge on the basis of a system of reference rates. Historically, most examples of effective policy coordination that have occurred, whether in the context of the G-7 (notably the Plaza and the Louvre Agreements) or the European Union (European Monetary System), have been centered around exchange rate targets rather than focusing directly on fiscal or monetary policy. An attempt to envisage a consistent global scenario for successful adjustment would necessarily involve demand policies as well as exchange rates and might prove a potent means for inducing changes in macroeconomic policies.

3. It follows that tests of the effectiveness of intervention that treat all interventions as equal, irrespective of whether the central bank is trying to reduce a misalignment or defy the market, are worthless.

4

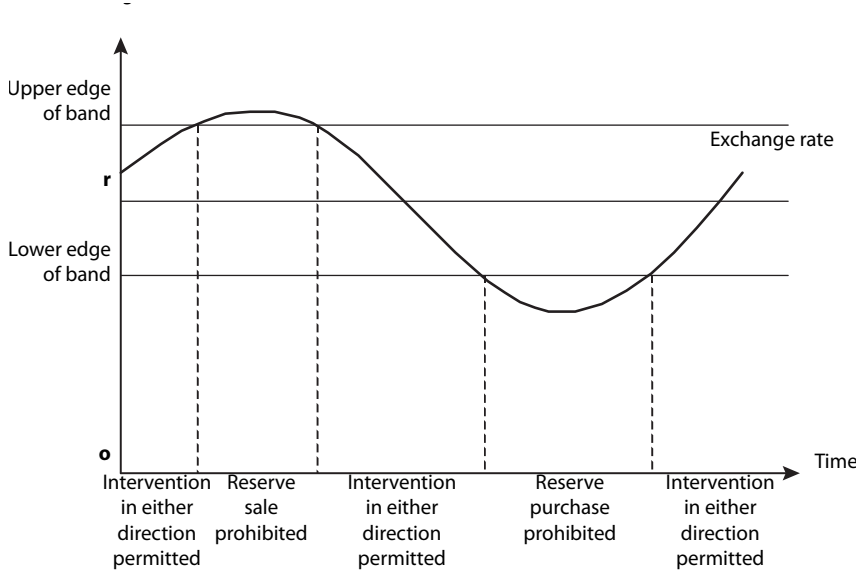
Three Alternative Variants of the Reference Rate Proposal

The reference rate proposal may take three slightly different forms. The simplest version involves no band but simply an obligation to refrain from intervention that would push the exchange rate away from the reference rate. One problem that some may perceive in such a rule is that it seems to commit the authorities to a belief that they can identify the "right rate." They may feel more comfortable with a rule that requires them only to name a band within which the equilibrium rate lies rather than a particular rate. The difference is largely psychological since any band has a center and there is in any case no compulsion to defend any particular rate, but psychological considerations may matter. And if there is a band, it may be a band within which intervention in either direction is permitted, or a band within which no intervention is allowed. Hence there are three versions of the reference rate proposal.

The Three Versions of the Proposal

The simplest ("canonical") version of the reference rate proposal prohibits a central bank from intervening to buy foreign exchange, and thus weaken the currency further, when its currency is weaker than the specified reference rate. Similarly, it would be prohibited from intervening to sell foreign exchange for domestic currency, so as to strengthen the latter, when its currency is stronger than its reference rate. Any intervention should thus have the effect of driving the exchange rate in the direction of the reference rate (though there is never any obligation to have any intervention at all). The rules are illustrated in figure 2.1 in chapter 2. Similarly, any

Figure 4.1 The original version of the reference rate proposal



other policies that may be specifically directed to influencing the exchange rate should tend to drive it toward its reference rate.

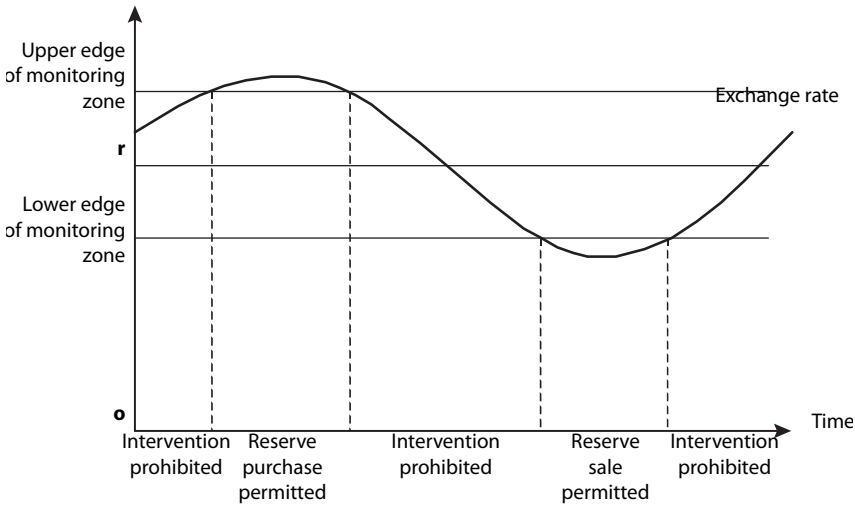
The second version of the reference rate proposal is that envisaged by Ethier and Bloomfield (1975) in their pioneering paper introducing the proposal. It is referred to subsequently as the "original version." This version would allow intervention in either direction within the band. The obligation of pushing the rate toward the reference rate would start to apply only once the deviation of the market rate from its reference rate exceeded a certain critical threshold. See figure 4.1 for a diagrammatic exposition.

The other variant of the proposal envisages a band within which no intervention at all would be permitted. Central banks would be allowed to intervene to push the rate toward the reference rate only once its deviation from the reference rate exceeded a critical threshold. The exchange rate would be obliged to float freely within a zone around the reference rate. This proposal was first advanced by the Tarapore Committee (1997) on Indian capital account convertibility. It called the band within which no intervention would be permitted a "monitoring zone." This variant is illustrated in figure 4.2.

Evaluating the Three Proposals

What are the pros and cons of these three variants? The big pro of the canonical version is its simplicity. It is the easiest variant to describe. The

Figure 4.2 A monitoring zone



disadvantage is that either of the alternatives might be more likely to appeal to certain groups with strong views, in addition to those with a psychological aversion to naming a specific rate rather than a band.

Those who are reluctant floaters would be more likely to see virtue in the proposal to allow intervention in either direction unless the market rate drifted sufficiently far from the reference rate to exceed a critical threshold (the "original version"). It would even be possible to reconcile this version with a bilateral peg, if the peg were adjusted periodically when the other currencies in the pegging country's effective exchange rate had appreciated or depreciated significantly against the peg currency. Provided these adjustments were made promptly and in small steps, they need not be disruptive to the market. Such a solution might offer a compromise system in which countries would be able to maintain their traditional policy of pegging but with an element of international discipline added. It might be particularly attractive to a country that trusted its own ability to select a parity more than it trusted the judgment of the IMF, although the Fund would still have the power to constrain a country's choice.

Conversely, the monitoring zone variant is closer to floating. It needs a strong presumption that the market is generating a misalignment to justify authorizing a country to depart from a free float. Those with little confidence in the ability to make estimates of equilibrium exchange rates will presumably feel more comfortable with this variant.

Would it be possible to allow some countries to adopt one variant of the proposal and others to adopt a different variant? If the monitoring zone

variant were to be adopted at the systemic level, it would preclude any country from adopting either of the other variants. Conversely, if the original version were to be adopted at the systemic level, then those countries that wished to would be free to constrain themselves more tightly, by adopting either the canonical variant or the monitoring zone variant. Were the canonical version to be adopted at the systemic level, it would rule out any countries adopting the original version, but it would allow those countries that so wished to adopt the monitoring zone version.

My sympathies are with monitoring zones, or failing that with the canonical version, rather than the original variant, because I believe that exchange rate changes play a useful adjustment role. My quarrel with floating is merely that it is prone to generate large misalignments. Nevertheless, if adoption of the original variant at the systemic level were the price of reaching agreement, I would not hesitate to pay it. The important issues are the introduction of an agreed international discipline on large misalignments and (a topic discussed later) the public identification of a set of estimated equilibrium exchange rates, and these could be achieved by any of the variants, including the original one. This system would in no way constrain countries that felt comfortable with a policy closer to floating, since it would merely be permissive.

5

Selecting and Agreeing on a Set of Reference Rates

A reference rate system would require agreement on the set of reference rates. This chapter first discusses the principles that should underlie determination of these rates and then the procedures that might best be used to achieve agreement on them.

Principles

The appropriate theory to use in calculating a set of reference rates would be the mainstream theory embodied in the macroeconomic model used explicitly or implicitly by just about every central bank in the world. According to this theory, the principal endogenous determinants of the current account are income and relative prices.[1] Income is determined by the full employment condition[2] and prices inherited from the past. In order for this system of equations to generate a (consistent) set of exchange rates, one needs a (consistent) set of current account targets.

Selecting a set of current account targets is by far the most politically sensitive part of the exercise. These targets play the role of "external balance" in the framework made famous by James Meade (1951). Some people argue that in this day and age there is no need for countries, or at least for major industrial countries with floating currencies and open capital accounts, to

1. Krugman (1991) termed this "the Mass. Avenue model," since it is the theory embraced on Mass. Ave., both in Cambridge, MA, and Washington, DC.

2. Or average income over the cycle; the two will be equivalent unless some areas systematically operate at a lower pressure of demand.

bother about pursuing external balance. Markets will automatically react to ensure timely noncrisis adjustment in endogenous variables like the current account. It is easy to agree that there is a considerable amount of elasticity in the system and that it would therefore be a mistake to press countries to hit narrowly defined targets for their current accounts. At the same time, some of us are impressed by the long history of occasions when we were assured that "this time it was different" and that there was no danger of a speculative attack occurring, shortly before one occurred. We were told that about the Latin American countries before the debt crisis ("countries don't go bankrupt"). We were told it about Mexico in 1994 (the peso was floating and Mexico had undertaken many reforms). We were told it about East Asia in 1997 (the current account deficits reflected high investment, not low saving). Now we are told it about the United States. Maybe this time the optimists are right, but it would seem safer to build in pressures for gradual adjustment. That is what a reference rate system is intended to do.

Suppose therefore that it is agreed that each country should accept a target for its current account balance in the medium term. In principle, one would want the target current account balances to reflect the saving and investment behavior of all agents so as to place economies on the intertemporally efficient path. Countries with high investment needs relative to the availability of savings from domestic sources ought to run current account deficits to supplement domestic resources with foreign savings. The problem with this proposition is that it is very general and does not serve to pin down objectively a set of quantitative figures that could be inserted in a model intended to generate reference rates. One might think of seeking to estimate a desirable current account balance by projecting sectoral balances for investment, saving, and, crucially, the fiscal balance. But if the reference rates are by construction consistent with projected fiscal policies, then the IMF necessarily cannot use this approach to try to influence fiscal policies. The role that it has up to now played in decrying large US fiscal deficits would be precluded. Those Europeans who believe that the major determinant of global imbalances is the US fiscal deficit could hardly be expected to accept that their view of the principal problem with the world economy would be ruled out by construction.

Conversely, if the IMF were to invent a set of current account targets, they would imply particular fiscal outcomes. It would be unrealistic for the IMF to try to use such assumptions to bind the fiscal policy of major countries. Moreover, it would be profoundly antidemocratic if it succeeded in binding the fiscal policy of democratic countries.

Since both uncritical acceptance of projected fiscal outcomes and IMF dictation of desirable fiscal outcomes are unacceptable, it may in practice prove necessary for the IMF staff to work with multiple scenarios. Multiple scenarios imply that multiple reference rates would emerge from the staff work. This does not necessarily imply that the Fund would ultimately have to present several sets of reference rates to the world, but it does require that

the Executive Board play a key role in agreeing on the unique set that would finally emerge.

One other point is of major importance for developing countries and emerging markets. Some of us believe that in such countries, the exchange rate can have a major impact on the growth rate. The argument (presented in Williamson 2003) is that a competitive exchange rate has a decisive influence on the propensity to invest, but of course a high propensity to invest achieves nothing if there are no funds (savings) to effect the investment. The growth-maximizing exchange rate is one where these two considerations balance at the margin. It implies a particular current account balance at full capacity output. It is this current account balance that I envisage being inserted in the set of equations as the current account target for such countries.

The next step is to establish the exchange rate implications of a set of current account balances. This task can be approached in several ways (good selections are presented in Hinkle and Montiel 1999 and Williamson 1994). My own approach was to appeal to large macroeconometric models in order to identify exchange rates that would have generated (in equilibrium) current account balances that would have matched the targets simultaneously in all the countries modeled (when they were all at internal balance). It has often proved difficult to secure convergence within a reasonable time horizon, leading many analysts who started from a similar intellectual position to use instead a partial equilibrium approach. Such an approach uses estimated trade and income elasticities to calculate where the equilibrium exchange rate is, given estimates of deviations from internal and external balance. Another approach uses an adjusted purchasing power parity approach, with adjustment being made for changes in factors that are known to influence the equilibrium exchange rate (like net foreign assets, relative productivity growth, the proportion of output accounted for by manufacturing, and commodity prices). The disadvantage of this approach is that it requires identification of a base period that was reasonably close to equilibrium. Yet another approach is used by Goldman Sachs to calculate their dynamic equilibrium exchange rates (GSDEERs), which are estimated by a single dynamic ordinary least squares estimation for all 35 countries now in the Goldman Sachs panel. This approach amounts to assuming that (apart from the country-specific dummies) the parameters of the equation (for productivity, terms of trade, and net international investment position/GDP) are identical for the 35 countries (O'Neill et al. 2005).

One popular way of estimating equilibrium exchange rates seems to me to be inappropriate: the calculation of a behavioral equilibrium exchange rate (BEER). I regard this as inappropriate because the calculation of BEERs uses current values of variables that have a clear cyclical component. For example, it is common to use interest differentials or the terms of trade of a particular year to estimate a BEER. This means that one will get an estimate much more akin to my concept of a current equilibrium exchange rate

(the rate incorporating cyclical though not speculative elements) than to my FEER, which is what one wants in this context.

Procedures

Establishment of a set of reference rates would require agreement on a series of procedural issues as well as the questions of principle discussed above. The first of these is where to put the responsibility of negotiating the reference rates. The obvious location for this would be the IMF, especially now that the members of the Fund have agreed that its central mission should be surveillance conducted multilaterally.

I would envisage such a process starting by the IMF staff using their favored approach, or perhaps a variety of approaches, on one or more sets of current account targets. This process would generate one or several sets of suggested reference rates for all IMF member countries, or at least for the larger countries (which certainly ought to include the larger emerging markets). The staff would present these to the IMF Executive Board at regular intervals (say half-yearly). A first issue would be whether there were major differences between alternative estimates of reference rates, and if so, which set should be chosen. It would of course be important to ensure that the set finally chosen was mutually consistent, and not to allow horse-trading to result in a set of inconsistent rates, but Executive Board views on the relative merits of different sets of estimates would surely be the decisive factor in choosing among them.

A second issue would be whether countries found the suggested reference rate appropriate for their country: Some countries might object that their proposed reference rate was too strong, and occasionally one might also complain that a proposed rate was too weak. The relevant executive director would make this case to the Board, using a mix of technical arguments (challenging some aspect of the IMF's model or claiming that the current account target was inappropriate or arguing that the Fund staff had overlooked certain special factors) and political pleading, as is customary in such contexts. The Board might find itself impressed or unimpressed by the case it heard. Where it declared itself impressed, the staff would take account of the arguments raised in developing a revised set of recommendations, making sure that the set of reference rates remained globally consistent.

The staff would then present their revised recommendations to the Board. It would be appropriate to show also the implied set of current account outcomes, even though at this stage, after choosing among multiple sets of estimates, it might be difficult to regard the projected outcomes as targets. If some countries remained dissatisfied, the process might be repeated, in principle more than once. But it would be necessary for the Board to reach agreement by a defined date, and it would therefore be nec-

essary to agree ex ante to a process for resolving any differences of opinion that could not be argued out in this way. I do not see that there is an alternative to allowing the (weighted) majority of the Board the ultimate right to impose its views on a minority. One would hope that this process would prove an acceptable way of choosing a set of reference rates: At least these only limit what countries are allowed to do rather than compel them to do what they might not want to.

Once agreement is reached, the set of reference rates would apply for the next six months. They would be expressed as effective exchange rates rather than bilateral dollar rates, so that movements of third currencies would not lead to policy distortions. Rapidly inflating countries (those with an inflation rate of more than, say, 10 percent a year) could also have their reference rates adjusted periodically—perhaps monthly, after publication of a prespecified relevant price index—so as to keep their real reference rates more or less constant.

6

Publication

In reporting on the decision of the International Monetary and Financial Committee (IMFC) to ask the IMF to conduct its surveillance multilaterally, the IMF's Morning Press summary stated that

> member countries welcomed efforts to enhance monitoring of exchange rates, but most said they were hesitant about the IMF publishing analyses on the theoretical fair value of currency rates because it was market sensitive.

It is therefore clear that the issue of whether the set of agreed reference rates should be made public is an important one. Indeed, if one does not wish the IMF to be given the power to impose hard rules on the fiscal and monetary policies that countries adopt, the power to influence the markets by publishing estimates of "fair values" of currencies may well be the most potent instrument that the Fund might wield. However, it should be acknowledged that a staff estimate that the dollar was overvalued by 15 to 35 percent in the 2006 Article IV consultation document with the United States appears not to have produced a ripple in the markets.

Whether publication of exchange rate analysis is a good idea depends very much upon the nature of the exchange rate system. It would certainly have been a very bad idea (at least from the standpoint of taxpayers) to publish the results of such studies during the old Bretton Woods days, when countries had an obligation to hold their exchange rates within narrow bands unless and until they decided that they faced a "fundamental disequilibrium." Anything that helped the market decide when a parity change was likely to occur would have been liable to add to a run on (or into) a country's currency, which the authorities would have been obliged to resist

up to the moment when they were ready to announce a parity change, and they would in consequence have lost more money to the speculators.

How about when the exchange rate is floating but the float is disciplined by a reference rate? Is it harmful to announce the reference rate and/or the analysis that underlies it?

One feature of floating is that at any time the weight of buyers in the market is equal to the weight of sellers, admittedly including any official intervention purchases or sales that may be taking place. Normally authorities intervene only when they believe the market exchange rate to be inappropriate, in a direction calculated toward correcting the misalignment. For example, they might buy reserves when the currency is in their judgment overvalued, or they might sell them when they believe the currency to be undervalued. Establishment of a reference rate system (most clearly, the monitoring zone variant) would simply limit intervention to circumstances when one of those conditions was satisfied and oblige it to be in a stabilizing direction.[1] Publication of the reference rates would do something to tell the market when it might expect such intervention.

Suppose, to take the extreme case, that publication enabled the private sector to know exactly when and on what scale intervention was to be expected. If the private-market participants believed the market rate was in fact going to move in accordance with the authorities' wishes, they would be motivated to anticipate the authorities' intervention by preemptively pushing the rate in the desired direction. Their market actions would reinforce the intentions of the authorities, meaning that publication would be advantageous. Accordingly publication would tend to lighten the needed actions by governments. Only if the market believed that the market rate was likely to move against the authorities' wishes, further from the reference rate, would they have an incentive to exploit knowledge of impending intervention. The extreme case is when the authorities decide to defend a certain rate, and the market can blow aside that rate; then knowledge of the authorities' intentions could indeed lead to increased activity by the private sector, the counterpart of which would be costly purchases and sales by the central bank. But the point of floating is to avoid precisely this type of situation. If the market has views of where the rate will go that are at variance with the wishes of the authorities, the latter have the option of simply letting it go there. This option is in no way precluded by announcing a reference rate, because the latter by definition implies no obligation to intervene.

The most important point is that a well-reasoned explanation of the set of reference rates, such as one would expect the IMF to supply, will increase

1. As asserted previously, it would be possible also to allow tactical intervention to counter disorderly market conditions when this condition was not satisfied, but the test of whether intervention satisfied this condition is that there should be no large trend change in reserves.

the information available to the private sector. It is well known that, in determining the buy and sell decisions that in turn give rise to exchange rates, the private sector gives little weight to the sort of long-term considerations that underlie equilibrium exchange rates. One explanation of this is that it is simply too costly for any individual market participant to undertake analysis that could lead to a remotely convincing diagnosis. But if such an analysis were undertaken by the official sector—especially by the relatively credible experts of the IMF's research department—and made available to the private sector, then the latter might be happy to utilize it by factoring it into its decisions. Simply by publishing its official estimates of reference rates, one would expect the IMF to provoke a public debate, out of which one might hope that something of a consensus view on the likely long-term exchange rate between a pair of currencies would emerge.

Perhaps the problem conceived by those authorities opposed to publication is fear that the IMF estimates would run counter to their policy preferences. Suppose, for example, that the US authorities believe their own propaganda about the virtues of a "strong" dollar, rather than believing that the dollar should be valued at an equilibrium level. In that case it is quite rational for them to resist publication of an IMF estimate that they might expect to diminish market willingness to continue holding an overvalued dollar. At least, it is rational given their irrational beliefs. It is quite another matter to agree that publication would be contrary to the interests of the United States. If one thinks that it is in the interest of US citizens that the dollar should not be overvalued, then the essence of the problem is that the US authorities are not correctly representing the interests of their citizens. A curtailment of their power is devoutly to be desired, even if it is not clear that it will be readily forthcoming.

Another possible basis for opposing publication would be skepticism regarding the possibility of making sensible estimates of equilibrium exchange rates. If the market took seriously published estimates that were more wrong than the figures implied by the market's unguided outcome, it is not only possible but in fact likely that publication would be harmful. This is one of the reasons for believing that the authorities should operate within a wide (implicit or explicit) band, such as a monitoring band. It is wrong to intervene to influence rates unless one is sure that one will be pushing them toward rather than away from equilibrium. A published estimate of the equilibrium rate that is 5 or 10 percent different from the actual market rate should not justify an official reaction, and in that case it is unlikely to provoke a market reaction. It is when the estimates suggest disequilibria of 15 or 20 percent that reactions become likely. While it is clear that markets have on occasion generated misalignments that large,[2] it

2. Think of the weak euro in 2000–2002 or the strong yen in 1995.

seems unlikely that estimates that have to go through an elaborate bureaucratic process could be that wrong.

While most currencies now float, there are some that still peg. Presumably pegging would not avoid the naming of a reference rate, and—unlike most pegs, which are usually bilateral pegs to some other currency—this would be expressed in terms of an effective exchange rate. A move of third currencies against the peg currency could then raise the likelihood that the peg would need to be adjusted, and publication would make this likelihood evident to the market. One could understand the authorities of such a country objecting to publication, although it is also relevant to note that they could avoid any problems by making small and timely changes in their official peg.

Last but unfortunately not necessarily least, some authorities may oppose publication because of unwillingness to accept that their policy objective ought to be an equilibrium exchange rate. In particular, they may wish to maintain an undervalued exchange rate because of a belief that this is the way to nurture export-led growth. The fallacies in this view have already been discussed, but that does not mean that it will not influence policy.

Past experience suggests that officials are even more reluctant to name equilibrium exchange rates when current market rates are far away from equilibrium. For example, at the time of the Plaza Agreement, the only thing agreed was the desirable direction of change, whereas at the time of the Louvre Agreement, officials agreed on a set of reference ranges (centered on the existing rates). Publication when the estimates of the reference rate are far from the prevailing market rates may look a more daring act, since it has been argued that it poses a danger of lost credibility if the market does not respond promptly. However, it is not clear that it is therefore rational to time announcements to coincide with times when the market exchange rates are close to their estimated equilibria. It may do more to establish the credibility of the system if the authorities have the courage to publish rates that are out of line with current market expectations but that are shown to make sense in the longer term.[3] If these estimates are both reasonably correct and taken seriously by the private sector, publication would certainly do more good.

I have argued above the positive case for publication of the IMF's figures for reference rates and the analysis that supports them. But the alternative of keeping the figures and the analysis secret appears totally impractical in this day and age. If the figures are not published, they will leak. But the leaked

3. A Brazilian journalist once reminded me that I had estimated the real's FEER against the dollar as about 2.5 at a time when the market was forecasting that the real would stay over 3 to the dollar. Subsequent history suggests that if anything I underestimated the equilibrium value of the real, but I clearly got brownie points for looking beyond my nose.

version cannot be corrected, as incorrect versions of a set of published figures can be. The informational advantage of supplying the market with informed analysis would be squandered. The IMF would open itself to the charge of resisting transparency, one of the good things of our day. It is difficult to believe that the representatives at the IMFC were really so committed to playing King Canute as the account of their deliberations suggests. Any market sensitivity of reference rates is something to be exploited, not an embarrassment that should lead to the reference rates being hidden. The contrary views still being expressed by parts of the official sector are a historical hangover from the days of the Bretton Woods system. They are an anachronism that deserves to be swept aside in the world in which we now live.

7

Hypothetical History

It may be helpful to indicate how some of the major macroeconomic issues of the last decade and a half might have been influenced had the world already had in place an effective functioning reference rate system. This chapter looks at Japan in the 1990s; Thailand, Indonesia, Russia, Brazil, Turkey, and Argentina before their crises; and the current global imbalances.

In telling an alternative hypothetical history, it is necessary to pick some particular value for the reference rates that would have been in force. I have done my best to select levels that are consistent with what I believed and wrote at the times under consideration, but these were not all cases on which I pontificated in public, and one's memory is not always perfect. There is a danger that some of the figures for reference rates that I assume are influenced by considerations that became clear only ex post. I acknowledge the problem, have done my best to avoid it, but in the last analysis have to rely on readers to use their judgment as to whether or not I have succeeded.

Japan in the 1990s

Whereas in the 1980s there were fears in the United States that high and sustained Japanese growth would lead to Japan becoming the new economic superpower, the 1990s were a decade of slow growth and recession in Japan. A few economists, most notably Ronald McKinnon (see McKinnon and Ohno 1997), have argued that the reversal in Japanese fortunes should be blamed on the post-Plaza pressure to correct the dollar's overvaluation. According to this line of thought, the yen appreciation required a declining

Japanese price level in order to sustain the Japanese current account surplus that reflects the savings surplus in Japan relative to the United States. The Japanese price deflation caused the recession and the banking problems in Japan.

The alternative view is that yen appreciation need not have implied Japanese deflation if the normal fiscal-monetary tools had been employed to expand internal demand in Japan in the 1980s, i.e., if Japan had not resisted adjustment. (Naturally a symmetrical reaction to expand US savings would have been needed; but even when tax wimps were running the US government, one could have relied on the Fed to give the necessary boost to net US savings as an alternative to letting inflation take off.) Instead the Bank of Japan was so dedicated to conquering inflation that it overshot and headed into deflation. Rather than promptly clean up the banking problems this created, Japan floundered for a decade.

When I first calculated a fundamental equilibrium exchange rate (FEER) for the Japanese yen, for 1983Q1, I estimated that a figure of $1 = ¥205 would be appropriate (Williamson 1983, 34). Two subsequent calculations yielded figures of ¥198 for 1984Q4 and ¥114 for 1990Q1 (Williamson 1994, 217). The difference appears large but is in fact fully explained by differential inflation, trend factors (the Houthakker-Magee effect, the large productivity growth in Japan in that period, and asset accumulation), the oil price decline of 1986, and a postulated change in current account balance targets (Williamson 1994, 219). William Cline (1989) developed his Economic Adjustment and Growth model that estimated the needed rate to be ¥102 at the end of 1989. The next calculation with the Institute for International Economics imprint was that by Simon Wren-Lewis and Rebecca Driver (1998, 69), who calculated an equilibrium rate for 2000 between ¥77 and ¥95, the central rate between which is ¥86. Although I was responsible for the current balance input to these calculations, I was surprised at the time that they had ended up with such a strong figure for the yen. However, it may have been because throughout the 1990s it seemed to me reasonable for Japan to allow the yen to be significantly weaker than its FEER, so as to allow the foreign sector to contribute to the revival of the Japanese economy. Now that Japan has recovered, a case for tolerating Japanese dollar purchases when the yen is weaker than its FEER no longer exists. Bearing in mind the substantial cumulative disinflation in Japan, partly offset by the high oil price and the fact that Japan is unusually dependent on foreign oil for its energy needs, I would put the current equilibrium yen-dollar rate in the 80s. Cline (2005) estimates a rate of ¥82 to be implied by his adjustment scenario.

A reference rate system with the reference rates following the above pattern might have influenced events in Japan in two ways. The first is that it would have made it easier for the Japanese authorities to mount a defense against the strong yen in 1995, when the yen peaked at about ¥80. On the above figures, its reference rate at that time would presumably have been around ¥95 (halfway between the above estimates for 1990 and 2000).

Hence, below ¥85 the Japanese authorities could have expected strong support in intervening to stem the dollar's rise, which might have prevented such a strong overshooting and the damage it did to the prospects for prompt recovery of the Japanese economy.

The other impact would not have been so helpful, because it would have precluded the extensive intervention in the opposite direction undertaken by the Japanese authorities in much of the period 1993–2004. Even the original variant of the reference rate system would have prohibited dollar purchases when the yen was weaker than around ¥108 in 1993 and ¥94 in 2000, which means that it would have prevented the big buildup of Japanese reserves in the 1990s. (The two alternative variants would have been even more restrictive.) Such a prohibition might of course have benefited the rest of the world, but one could only argue that it would also have benefited Japan if it had prompted the Japanese authorities to act sooner than they did to clean up the banking system. Ceteris paribus, an effective ban on dollar purchases by the Japanese authorities would have worsened the stagnation of the Japanese economy. In this instance it cannot be claimed that a reference rate system would have helped steer macro policy in a favorable direction.

Thailand Before 1997

Thailand's 1997 crisis reflected the large and sustained current account deficits of the previous years. For a long time these deficits were financed, indeed overfinanced, by capital inflows. Had the exchange rate been flexible, there is no doubt that it would have floated upward and that the current account deficits would in consequence have been even larger. It is only during the final months before the crisis that one would have expected a weaker exchange rate that would have helped promote the adjustment that Thailand needed.

Had there been a reference rate for the Thai baht before 1997, it would have had to be for a rate that at full employment would have been expected to generate a deficit of 3 or 4 percent of GDP, the traditional rule of thumb for a prudent, sustainable maximum to the level of capital inflow. A Thailand with a floating baht would have been allowed to intervene to build up its reserves while the market was pushing funds at Thailand. The policy difference would have occurred when the market first became suspicious of Thailand in late 1996. Under the canonical variant of the reference rate proposal, the authorities would have been obliged to permit a depreciation at least close to the reference rate (i.e., to a more competitive rate than that which in fact held). The absence of a commitment to defend a particular exchange rate might well have encouraged them to permit a depreciation to beyond the reference rate in the first half of 1997. It is conceivable that this would have headed off the crisis, at least assuming it was supported by fiscal-monetary measures to restrain demand.

It is thus possible, and even likely, that floating with a reference rate would have performed better than a regime of unmanaged floating. The government would have been permitted to intervene to buy dollars in the years when capital inflows exceeded the current account deficit, thus mitigating the excessive appreciation that would have been likely under floating. The attempt to manage the exchange rate would have been a disincentive to the creation of the Bangkok International Banking Facility, which increased the inflow of unstable bank loans to Thailand. Even if appreciation had still occurred, the fact that the government was signaling that it believed the currency to be overvalued during the boom years would have encouraged businessmen to continue basing their export-oriented investment on a more competitive value of the baht. The economy might thus have been in a significantly stronger position by 1997. Instead of wasting reserves on defending the indefensible before July 2, 1997, the authorities would still have been holding reserves after the crisis broke (assuming pessimistically that there had still been a crisis), with which they could have sought to limit the collapse of the baht. I thus see little reason to doubt that a reference rate system would have been beneficial in Thailand.

Indonesia in 1997

Indonesia was in a very different situation from Thailand before the East Asian crisis. Exports were still increasing at a healthy rate (some 7 percent a year), unlike in Thailand, suggesting that the exchange rate was not overvalued. GDP was growing at over 4 percent a year; inflation was significant (about 8 percent a year) but under control, and its payments impact was neutralized by a crawling devaluation; foreign debt was high but not overwhelming; the current account deficit was reasonable (3.4 percent of GDP in 1996); and the fiscal accounts were in surplus. We are now very conscious that the regime was corrupt, its banking sector was chronically weak, and the social situation was potentially inflammable, but the record of the preceding quarter century was impressive, and macroeconomic policy was exemplary.

What disturbed this situation a few weeks after Thailand's float was a sympathetic withdrawal of funds from the rupiah. Had the IMF asked Indonesia to take a $30 billion loan on condition that it not change its policies, it is conceivable that the country would have ridden out the crisis. But in fact the IMF welcomed the decision to float the rupiah that the central bank governor announced on August 14, 1997. Many of the entrepreneurs whose businesses had borrowed uncovered dollars saw matters differently and rushed to buy dollars to hedge their exposure. This rush intensified the depreciation and ultimately led to the crisis that caused a severe recession (a 14 percent decline in GDP in 1998) and brought down the regime. The best

one can say in favor of the course that was pursued is that maybe Indonesia got democracy a bit quicker than might otherwise have happened.

If Indonesia had had a reference rate, presumably it would not have been that different from the center of the band at the start of the crisis, since there was no reason to think that the rupiah was particularly overvalued at that time. The reference rate against the dollar would surely have depreciated subsequently to reflect the collapse of the neighboring currencies, since they were all strong export competitors, but it would not have depreciated nearly as much as the actual value of the rupiah did. Conceivably a demonstration that the international community saw no sense in a severe depreciation would have helped head off the total economic collapse that occurred, but one may doubt if it would have made a lot of difference. It would have been more helpful if Indonesia had moved to a float well before the crisis, when confidence was still strong, so that Indonesian businesses had been given both the incentive and a chance to cover their exposure without unduly weakening the currency before the opportunity vanished. What seems crystal clear in hindsight is that the switch to floating came at the worst time. But it is difficult to believe that the existence of a reference rate system would in this case have done a lot to mitigate the disaster.

Russia in 1998

In 1998 Russia was still in the early stages of emerging from the chaos of the transition. It had decided that a key policy objective should be stabilizing inflation, and it had tied the ruble to an almost fixed exchange rate with the dollar in an attempt to achieve that. An unfortunate consequence of this policy was the real appreciation of the ruble, which had made imported consumer goods extremely attractive to consumers and had therefore led to great difficulties for Russian import-competing industries almost across the board. The current account was still (more or less) in surplus because of energy exports, but industrial output was extremely weak.

The other unfortunate consequence was unsustainable debt dynamics. High interest rates were needed to sustain the overvalued currency. These interacted with weak tax revenue, which resulted from soft budget constraints extended by the energy industries to manufacturing in the attempt to prevent the latter being eviscerated by the overvalued exchange rate, to produce a large fiscal deficit. The deficit then required even higher interest rates, resulting in unsustainable debt dynamics.

The crisis of August 1998 led to the abandonment of this policy regime. GKOs (ruble-denominated short-term debt) were unilaterally reconstructed in such a way as to greatly reduce their present value. And the ruble was allowed to float. Against official expectations, the initial spike in inflation and a further decline in output were soon countered by industrial revival

and a slowing of inflation. This made it possible to harden budget constraints, which reinforced the beneficial trends. There may well have been unfortunate spillover effects on the rest of the world, like the run on Brazil and the collapse of Long-Term Capital Management (LTCM), but ruble devaluation was just what the Russian economy needed.

Any reasonable estimate of a reference rate in 1998 would have been for a substantially more competitive rate than that which prevailed before the crisis. The IMF could hardly have designed a program like that of July 1998, predicated on the attempt to defend an overvalued exchange rate (by more foreign loans, a commitment to a future primary surplus, and a market-based debt swap). By being forced to adjust its policy regime to conform with reality rather sooner, it is possible that Russia would have avoided the need for debt reconstruction. I thus believe that a reference rate regime would have benefited both Russia and its creditors.

Brazil

Brazil finally stabilized the longest-running period of high inflation in history in July 1994, with the Real Plan. The essence of this plan was the replacement of the old monetary unit by a new money that consisted of the former indexation unit. The new money was initially allowed to float, whereupon it floated upwards. To limit the loss of competitiveness, the Brazilian government eventually tied the real to the dollar and then initiated a crawling devaluation. Unfortunately the crawl was not fast enough to avoid further losses of competitiveness, let alone to reverse the initial loss of competitiveness suffered from the appreciation of the real in its first weeks, so that Brazil moved into strong current account deficit. Yet Brazilian policymakers were anxious to maintain a strong real, which became thought of as the anchor for the price level, and to that end ran astronomical real interest rates to attract funds to finance the current account deficit and counter the highly expansionary fiscal policy. By 1996 the real was significantly overvalued (though inflation had by then been reduced to a level where competitiveness was marginally improving).

When investors looked around the world after the Russian devaluation and the demonstration that the IMF would not always bail out countries in trouble, it was natural that they should focus on Brazil as a country that might be vulnerable to a run. The initial run in the second half of 1998 was thwarted by a large IMF loan granted on condition that the much overdue tightening of fiscal policy should finally be put into effect. This loan held the situation for several months, till after the Brazilian elections and until the world economy had emerged from the vulnerable state created by the LTCM crisis. But then in January 1999 a governor refused to pay his state's debts, which provoked a new run on the real. After an abortive attempt at a limited devaluation, a new governor of the central bank took office, the real was

floated, and interest rates were raised. To general surprise, Brazil posted positive (if small) growth in 1999, though the reason turns out to have been that the central bank had bought many dollar debts to largely shield the private sector from the cost of currency mismatches.

Just over three years later, the public opinion polls predicted that Lula would win the presidential election. The financial markets thereupon panicked. Country risk went to over 2,500 basis points, the exchange rate collapsed, and—driven by the size of debt inherited from the 1999 crisis and the weight of dollar-linked debt in the total—debt dynamics looked dangerous. The recovery started even before Lula took office, following announcement of one of the better Fund programs in which the crucial conditionality was a promise by all the serious candidates to maintain responsible macro policies if elected. The subsequent maintenance of firm fiscal policy, plus for a while a highly competitive exchange rate, led to unprecedented current account surpluses, some reduction in the debt/GDP ratio, and a dramatic reduction in the ratio of external debt to exports.

Had a reference rate system been in effect, the reference rate would surely have been something like the value of the real at the beginning of July 1994. It would have indicated that the real was allowed to become, and remain, far too strong for much of the second half of the 1990s. After the float, the real initially depreciated too much, but then bounced back, until the contagion of the Argentine crisis. (The idea that this crisis caused no contagion is wrong, as an examination of the value of both the Chilean peso and the Brazilian real in late 2001 shows.) The real was already somewhat undervalued before the panic caused by the prospect of Lula's election but then became extremely undervalued during the campaign. It was rather slow to recover but has now become somewhat overvalued again.

How much difference would it have made if the international community had promulgated a reference rate? One has to assume that it would have made a difference to Brazilian economic policy in the 1990s, since a part of the rule book suggested above is that interest rates held above their internally optimal level would be illegal if they were holding a currency above its reference rate. The reference rate would also have restrained the purchase of reserves while the real was undervalued in 2003–04. Whether it would also have influenced the private sector is more debatable, but at the very least one can surely say that it would not have done any harm.

Turkey

The repeated stabilization and reform programs introduced by Turkish governments from the 1970s onwards had succeeded in some dimensions, like opening the Turkish economy and maintaining a reasonable growth rate, but had dismally failed to tackle inflation. Through the 1990s the average inflation rate in Turkey had been almost 70 percent per year. To counter

this, Turkey embarked on an IMF-supported program at the beginning of 2000 embodying a preannounced decelerating crawling peg exchange rate regime with widening bands, which would end up as a floating rate after 18 months. All went well for the first few months, with declining inflation and interest rates and a large inflow of capital, primarily short term. However, inflation did not fall fast enough to avoid a large real appreciation, partly in consequence the current account deficit widened substantially, and short-term capital inflows intermediated by the weak banks financed the large fiscal deficit. The first speculative attacks on the Turkish lira in November 2000 were beaten off, but a renewed attack sparked by political bickering in February 2001 led to abandonment of the exchange rate regime and a float of the lira. The severe depreciation consequent on abandonment of the exchange rate regime caused corporate and banking crises, a credit crunch, and a 7.5 percent fall in GDP in 2001.

The initial value of the crawling peg was fixed after careful analysis, so one may assume that a reference rate would have been similar. In subsequent months the Turkish lira appreciated relative to that value. One possibility is that the evidence of growing divergence would have prompted a revision of policy, such as a tighter fiscal policy, in the course of 2001. Another possibility is that the markets would have been rattled by the evidence of growing overvaluation and would have refused to lend as much. Since higher interest rates would have been ruled out by the overvalued lira, the government would have been forced to reduce its borrowing, and the ultimate crisis would have been attenuated. A reference rate would thus have been helpful.

Argentina

Argentina was another country with a history of extreme instability, which appeared to have stabilized in the 1990s. What was supposed to be the definitive stabilization had been achieved on April 1, 1991, when the Argentine peso had been locked 1:1 to the US dollar through an act of the Argentine Congress backed up by almost turning the central bank into a currency board. As is the normal pattern with an exchange rate–based stabilization, inflation fell rapidly but not quickly enough to prevent a substantial overvaluation emerging. Fiscal deficits fell but were not replaced by the sizable surpluses that would have been needed to establish full credibility for the fixed exchange rate. The country rode out the Tequila Crisis of 1994–95, but the devaluation of the real and the levitation of the US dollar to which the peso was tied made Argentina's situation increasingly untenable after 1998 (when production peaked). Argentina got a big loan from the IMF in late 2000, and yet more money in August 2001. Its price level was by then falling against the dollar, which might in due course have been expected to do something to reverse the large current account deficit that had devel-

oped. But all this was to no avail: A run on the banks and out of the peso developed in December 2001, debt servicing was suspended, Congress changed the law to allow the peso to float, and a crisis rapidly overwhelmed the country.

Initial policy measures, like asymmetric pesification, made the situation worse rather than better, and Argentina entered a very deep recession (an 11 percent fall in GDP in 2002, to a level nearly 20 percent below the 1998 peak). But several factors soon started to work toward recovery. When the fixed exchange rate was abandoned, the peso depreciated to a level that acted as a big spur to exports (even after the government imposed heavy export taxes on many commodities) and discouraged imports. The government has since stabilized the peso at a value of a little over 3:1. The fiscal situation was relieved by the reduction in the real value of government personnel expenditure and the decline in debt service payments, which was made permanent after sufficient bondholders accepted the debt reconstruction of 2005. In fact, output recovered its precrisis level in 2005 and is still growing rapidly as this is written.

A reference rate would have been at a level substantially more competitive than the rate that prevailed in the second half of the 1990s and up to the crisis but substantially less competitive than the current rate (September 2006). It would have affected policy before the crisis to the extent that the authorities took it seriously. Even if the authorities tried to ignore it, a reference rate substantially weaker than the market rate might have discouraged banks and bond buyers from lending so much and encouraged wealth owners to move out of the peso while the going was good. In that way it is likely that Argentina would have been unable to maintain its doomed system for so long (and therefore lenders would probably not have lost so much money and Argentineans would not have suffered as much). Of course, if one thinks it important that misguided national authorities should be helped to impoverish their citizens (as well as foreigners), one will deplore such an incursion in national sovereignty.

In the past several years, a reference rate system would have prohibited Argentina from buying dollars to add to its reserves, given that its exchange rate was weaker than the reference rate would have been. The expected consequence would have been an appreciation of the peso and therefore lower exports, higher imports, a less positive trade balance, and slower growth (but less inflation). To maintain an equally fast rate of growth, the country would have been obliged to stimulate a somewhat faster growth of domestic demand. In most countries it is all to the good if the authorities are required to maintain a balance between external and internal demand rather than relying overwhelmingly on either, but in the particular case of Argentina one can argue that the exceptionally rapid improvement in the external position mitigated the prevailing lack of market confidence. If one believes that such cases may occur from time to time, then one might want to legislate an escape clause in the reference rate rules,

for this is a case in which a reference rate would have impeded recovery. On the other hand, it would have been unambiguously beneficial before the crisis.

The Current Global Imbalances

The latest IMF *World Economic Outlook* (for September 2006) forecasts that in 2006 the United States will have a current account deficit of $869 billion. Offsetting this deficit will be a surplus of $505 billion by the oil exporters, $184 billion by China, $167 billion by Japan, and $79 billion by the Asian newly industrialized economies (NIEs). The picture is rounded out by a net $51 billion surplus by other industrial countries (consisting of $322 billion deficits marginally outweighed by $373 billion surpluses), a net $102 billion deficit by other developing countries, and a statistical discrepancy of a mere –$16 billion.

Some of the increase in the US current account deficit is a direct result of the higher price of oil. However, this does not appear to be the major explanatory factor. The April 2006 *World Economic Outlook* (p. 91) says: "the increase in oil prices since 2003 has directly worsened the US current account deficit by over 1 percent of GDP. . . ." So perhaps $120 billion of the expected $869 billion deficit could either be expected to adjust naturally as the oil price declines to more normal levels or be adjusted by increased imports from the oil-exporting countries if the oil price increase proves permanent. There remains a deficit of maybe $740 billion, about twice the level that corresponds to a 3 percent of GDP deficit, which a rule of thumb sometimes considers to be safely sustainable and which has been widely treated as a target for the United States.

The three other surplus areas identified above are all in Asia. Japan was long considered to be a less compelling candidate for adjustment action than other surplus countries because of the difficulties it was encountering in using other policy instruments to stimulate demand. That reason no longer looks compelling in the light of the Japanese recovery. China and the Asian NIEs all look anomalous in the light of standard theory, which identifies developing countries as likely to be short of capital and therefore natural capital importers (i.e., countries with current account deficits). One of the Asian NIEs, namely Singapore, now has a level of per capita income at which it is conceivable that there are many better investment opportunities abroad rather than at home, but in all the other cases a current account surplus that is used to build up reserve holdings beyond a prudent level appears an irresponsible waste of resources.

My colleague William Cline (2005) attempted to calculate a scenario that would support US adjustment of the magnitude envisaged. Naturally the exchange rate changes that he conceived would need to be supported by appropriate changes in demand, by tightening fiscal policy in the United

Table 7.1 Exchange rate change for US external adjustment

Country/region	Exchange rate
Brazil	R2.16 per US dollar
Canada	0.75 US cents per Canadian dollar
China	RMB5.67 per US dollar
Euro area	$1.36 per euro
Japan	¥82.0 per US dollar
Korea	Won 859 per US dollar
Mexico	Pesos 8.5 per US dollar
Singapore	Singapore $0.91 per US dollar
Switzerland	SwFr 1.00 per US dollar
United Kingdom	$2.13 per pound

Source: Cline (2005).

States, and by corresponding expansionary policies almost everywhere else. But he also calculated a set of 27 exchange rate changes that, in conjunction with the changes in demand, could be expected in due course to produce a fall in the US current account deficit to about 3 percent of GDP. Most of the changes that he calculated (with the exception of that for Canada, which has already been far surpassed in the market) look rather large, but it must be remembered that—except for countries geographically close to the United States—the resulting changes in effective exchange rates would be far smaller, since the main trade partners of other countries would also be appreciating against the dollar. That said, table 7.1 shows a sample of his results, which (despite my specific reservations, notably with regard to Canada and the United Kingdom) are as good an estimate of where reference rates might be as currently exists.[1]

Suppose that this set of rates had been adopted as reference rates in the past. The question is whether it would have made a difference to global payments positions. Would exchange rates have been affected? Would countries' policies have been adjusted? Would payments outcomes in consequence have been different?

All the countries listed above except China currently have floating exchange rates, so radically different considerations apply with respect to China and to all other countries. Let us consider China first. *If* a reference

1. Table 7.1 shows dollar rates rather than effective rates even though it is the latter that are conceptually more relevant. The reason is that figures for absolute levels of effective exchange rates are not meaningful: It is the changes that are of interest. But (a) we lack statistics on the effective rates of all these currencies that would permit updating of Cline's figures to a more recent date and (b) it is dollar rates that stick in most people's minds. In any event, the difference is not key when all other rates are at their reference rates.

rate system had been in effect, with a reference rate of RMB5.67 per dollar, then China would not legally have been able to intervene to hold the renminbi at a value of around RMB8 per dollar (more until May 2006). One conclusion this suggests is that therefore China would not under present circumstances agree to introduce a reference rate system that it would know was going to constrain it in this way. However, suppose that the reference rate system had already been in effect when China replaced Taiwan in the Chinese seat in the IMF. Presumably a reference rate system would not have deterred China from wanting to take Taiwan's place. From then on, China would have been subject to the IMF rules. And whatever criticisms of Chinese policy one may hold, China has generally been scrupulous in obeying such international obligations as it has signed (with the arguable exception of its enforcement of intellectual property rights). Hence one has to assume that under these circumstances China would have either floated the renminbi or revalued. I do not propose to discuss here whether either of these steps would have been a good thing (though personally I am convinced it would have been good for both China and the rest of the world), I am merely concerned to make the point that there would have been a very definite impact on policy. A functioning reference rate system would undoubtedly have changed the way the world works.

The existence of a set of reference rates might have affected floating exchange rates through two channels. For given policies, foreign exchange dealers might have fed the additional information into their trading strategies, which might have changed the exchange rates at which they bought and sold currencies. Had there been such an effect, it would have pushed exchange rates toward the reference rates. The other channel is that it might have altered policies. For some of the smaller currencies, and for Japan before March 2004, the main effect would have been to constrain intervention policy. For the United States, at least during the Clinton administration, there would have been a constraint on "oral intervention" (it would have been illegal for the US treasury secretary to speak in favor of a strong dollar when the dollar was already stronger than its reference rate). To the extent that the net result had been a more competitive dollar, the US current account deficit would have been smaller and US demand would have been stronger. Except during the 2001–02 recession, one can assume that the stronger demand would have resulted in a more restrictive monetary policy by the Fed in order to make room for the additional demand (it seems that fiscal policy is nowadays invariant to the strength of demand as a reflex anti-Keynesian reaction, but monetary policy doesn't suffer from such hang-ups).

The end result would have been smaller global imbalances. The US dollar would have been weaker, US savings would have been larger, and the US current account deficit would have been smaller. Whether the effects would have been sufficiently large to avoid the risk of a global crisis is unclear, but there can be no serious doubt about the qualitative direction of impact.

Currently the major counterpart to the US deficit lies in East Asia and the oil-exporting countries, and the euro area likes to pride itself on not being a part of the problem. However, several years ago there was also a severe misalignment involving an undervaluation of the euro. Had a reference rate system been in effect, it might have helped prevent that misalignment becoming so large and/or corrected that misalignment sooner (inter alia by restraining the foolish statements of US treasury secretaries lauding a strong dollar).

The issue already discussed of whether it would make sense to publish estimates of reference rates at a time such as the present, when market rates are in many cases far from the reference rates, would arise in acute form if the system were to be introduced soon. My own view is that the usefulness of the system is even greater when market rates are far from equilibrium. They are more likely to have an impact on intervention policy, they are less likely to push that policy in an incorrect direction, and they are more helpful to the private sector in making rational investment decisions. The multilateral consultation process agreed at the spring 2006 meetings of the International Monetary and Finance Committee is a natural context in which to introduce reference rates. Announcement that the participating countries were willing to negotiate a set of reference rates, and to abide by the set negotiated, would preempt the cynicism that otherwise may greet the results of the IMF exercise.

8

Conclusion

The reference rate proposal was one of the first ideas to be developed for disciplining the intervention policies that countries pursue in a world of floating exchange rates. A hint of the idea appeared in the Interim Guidelines for Floating, which the IMF developed in 1974,[1] but then the idea got submerged in the more laissez-faire version of floating that the IMF adopted after the Second Amendment of the Articles took effect in 1978. When the Institute for International Economics developed ideas for a more structured international monetary system in the 1980s, we focused on ideas for target zones for exchange rates, rather than guidelines for floating. However, it has now become clear that most large countries value the freedom that floating offers and are unwilling to accept the constraints on their freedom of action implied by a target zone system. That is why this study has asked whether some of the substantive advantages in a target zone system could still be reaped with a system that preserves the lack of obligation

1. Guideline 3 read: "(a) If a member with a floating rate should desire . . . to bring its exchange rate within, or closer to, some target zone of rates, it should consult with the Fund about this target and its adaptation to changing circumstances. If the Fund considers the target to be within the range of reasonable estimates of the norm for the exchange rate in question, the member would be free . . . to act aggressively to move its rate toward the target zone. . . . (b) If the exchange rate of a member with a floating rate has moved outside what the Fund considers to be the range of reasonable estimates of the medium-term norm for that exchange rate to an extent that the Fund considers to be likely to be harmful to the interests of members, the Fund will consult with the member, and . . . may encourage the member . . . (i) not to act to moderate movements toward this range, and (ii) to take action to moderate further divergence from the range. A member would not be asked to hold any particular rate against strong market pressure" (De Vries 1985, 488–89).

to hold the line at a particular exchange rate (which means with a floating exchange rate).

The study has argued that a reference rate system could indeed still give assurance against aggressive intervention and could still provide a framework in which countries could work together to avoid dangerous payments outcomes. These benefits would be attainable without endangering the other important recent trend in macroeconomic policy: the adoption of inflation targeting as providing a nominal anchor. One can debate how large the effects would be, but in most cases it is difficult to see that such effects as exist would be other than beneficial. That is not for a moment to claim that they would solve all problems: The hypothetical histories presented above make that very clear. In some cases reference rates would have been unlikely to make much difference, and there are even a couple of cases (Japan in the 1990s and Argentina after its crisis) when it was clearly helpful to the national authorities to have been able to generate large foreign demand by holding rates that would have been prohibited by a reference rate system. But these are the exceptions and not the rule. If the world wants a system where the presumption is for national actions to be internationally consistent, then the most promising is a reference rate system.

In particular, a system of reference rates offers more than would be possible by giving substance to the existing rule prohibiting exchange rate "manipulation." This system requires development of a clear view of equilibrium rates, and cannot authorize intervention that would have the effect of impeding market rates' movement toward those equilibria. It offers the chance to anchor private expectations.

Reference rates seem unlikely to be adopted in the near future, if only because they would quite unambiguously prevent China and other East Asian countries from pursuing their current economic strategy, which involves running large current account surpluses.[2] There are, however, at least two circumstances under which one could envisage the world adopting a reference rate system.

By far the most likely is adoption in reaction to a crisis. Every major international monetary change in history has come about this way. In 1944 nations gathered together at Bretton Woods to design an international monetary system that would avoid repeating the disaster of the 1930s. In 1973 countries adopted the regime of generalized floating because they saw no other way of exiting the crisis of the Bretton Woods regime. The

2. This strategy is often described as "export-led growth." However, I prefer to use that term in its original sense, in which the distinguishing feature is that export growth rather than import substitution is looked to as the main mechanism for avoiding a balance-of-payments constraint. In practice export expansion often made the countries involved attractive recipients of capital inflows, which enabled the countries practicing export-led growth to run current account deficits (as several of the East Asian countries did before 1997).

present growth in global imbalances threatens to end up inducing a collapse of the dollar, which could in turn produce a severe recession in the rest of the world, since income and substitution effects would reinforce one another to depress income. (In contrast, the substitution effect would be expansionary in the United States.) It is conceivable that this crisis could induce countries to say "never again" and to search for a system that would give the promise of avoiding similar disasters in the future. There is a much better chance that the search will end with a successful outcome if thought has been given in advance to the sort of system that might fit the bill. That is why the merits of a reference rate system need to be discussed now even if one is not optimistic about the chances of its imminent adoption.

By far the most desirable possibility would be the adoption of a reference rate system with the intention of heading off such a crisis. If there were widespread agreement that such a crisis might occur, and if world leaders showed a high order of statesmanship, then some group like the G-20 might agree on the desirability of such a move and order the negotiation of the necessary changes in the IMF. At the moment there is a lack of both wide agreement on the diagnosis and many world leaders with the requisite sense of statesmanship, which is why I am not optimistic about imminent adoption. But, to repeat, that should not exclude discussion and analysis.

References

Bean, Charles. 1998. The New UK Monetary Arrangements. *Economic Journal* 108, no. 451 (November): 1795–809.

Cline, William R. 1989. *United States External Adjustment and the World Economy.* Washington: Institute for International Economics.

Cline, William R. 2005. *The United States as a Debtor Nation.* Washington: Institute for International Economics.

De Grauwe, Paul, and Marianna Grimaldi. 2006. *The Exchange Rate in a Behavioral Finance Framework.* Princeton, NJ: Princeton University Press.

De Vries, Margaret Garritsen. 1985. *The International Monetary Fund 1972–78: Cooperation on Trial.* Volume III: The Documents. Washington: International Monetary Fund.

Dominguez, Kathryn M., and Jeffrey A. Frankel. 1993. *Does Foreign Exchange Intervention Work?* Washington: Institute for International Economics.

Edison, Hali J. 1993. *The Effectiveness of Central Bank Intervention: A Survey of the Literature after 1982.* Special Papers in International Economics 18. Princeton, NJ: International Finance Section, Princeton University.

Ethier, Wilfred, and Arthur I. Bloomfield. 1975. *Managing the Managed Float.* Princeton Essays in International Finance 112. Princeton, NJ: International Finance Section, Princeton University.

Frankel, Jeffrey, and Kenneth Froot. 1986. Understanding the US Dollar in the Eighties: The Expectations of Fundamentalists and Chartists. *Economic Record:* 24–38.

Frankel, Jeffrey, and Kenneth Froot. 1987. Short-Term and Long-Term Expectations of the Yen/Dollar Exchange Rate: Evidence from Survey Data. *Journal of the Japanese and International Economies* 1: 249–74.

Frankel, Jeffrey, and Andrew K. Rose. 1994. *A Survey of Empirical Research on Nominal Exchange Rates.* NBER Working Paper 4865. Cambridge, MA: National Bureau of Economic Research.

Fratzscher, Marcel. 2004. Exchange Rate Policy Strategies and Foreign Exchange Interventions in the Group of Three Economies. In *Dollar Adjustment: How Far? Against What?* ed. C. Fred Bergsten and John Williamson. Washington: Institute for International Economics.

Friedman, Milton. 1953. The Case for Flexible Exchange Rates. In *Essays in Positive Economics.* Chicago, IL: University of Chicago Press.

Hinkle, Lawrence E., and Peter J. Montiel. 1999. *Exchange Rate Misalignment: Concepts and Measurement for Developing Countries.* New York: Oxford University Press for the World Bank.

Jurgensen Report. 1983. *Report of the Working Group on Exchange Market Intervention.* Washington: US Treasury.
Krugman, Paul R. 1985. Is the Strong Dollar Sustainable? In *The U.S. Dollar—Recent Developments, Outlook and Policy Options.* Kansas City: Federal Reserve Bank of Kansas City.
Krugman, Paul R. 1991. *Has the Adjustment Process Worked?* Washington: Institute for International Economics.
Krugman, Paul, and Marcus Miller. 1993. *Why Have a Target Zone?* NBER Discussion Paper 718. Cambridge, MA: National Bureau of Economic Research.
Kubelec, Chris. 2004. Intervention When Exchange Rate Misalignments are Large. In *Dollar Adjustment: How Far? Against What?* ed. C. Fred Bergsten and John Williamson. Washington: Institute for International Economics.
Marris, Stephen. 1985. *Deficits and the Dollar: The World Economy at Risk.* Washington: Institute for International Economics.
McKinnon, Ronald I. 1979. *Money in International Exchange.* New York: Oxford University Press.
McKinnon, Ronald I., and Kenichi Ohno. 1997. *Dollar and Yen: Resolving Economic Conflict Between the United States and Japan.* Cambridge, MA: MIT Press.
Meade, James E. 1951. *The Theory of International Economic Policy: Volume I, The Balance of Payments.* London: Oxford University Press for the Royal Institute of Economic Affairs.
Meese, Richard A., and Kenneth Rogoff. 1983. Empirical Exchange Rate Models of the 1970s: Do They Fit Out of Sample? *Journal of International Economics* 14: 3–24.
Obstfeld, Maurice. 1995. International Currency Experience: New Lessons and Lessons Relearned. *Brookings Papers on Economic Activity* 1. Washington: Brookings Institution.
O'Neill, Jim, Alberto Ades, Hina Choksy, Jens Nordvig, and Thomas Stolper. 2005. *Merging GSDEER and GSDEEMER: A Global Approach to Equilibrium Exchange Rate Modeling.* Goldman Sachs Global Economics Paper 124. Available at https://portal.gs.com.
Rogoff, Kenneth. 1996. The Purchasing Power Parity Puzzle. *Journal of Economic Literature* 34 (June): 647–68.
Sarno, Lucio, and Mark P. Taylor. 2001. Official Intervention in the Foreign Exchange Market: Is It Effective and, If So, How Does It Work? *Journal of Economic Literature* 39 (September): 839–68.
Schwartz, Anna J. 2000. *The Rise and Fall of Foreign Exchange Market Intervention.* NBER Working Paper W7751. Cambridge, MA: National Bureau of Economic Research.
Svensson, Lars E. O. 1992. An Interpretation of Recent Research on Exchange Rate Target Zones. *Journal of Economic Perspectives* 6, no. 4 (Fall): 119–44.
Tarapore Committee. 1997. *Report of the Committee on Capital Account Convertibility.* Mumbai: Reserve Bank of India.
Taylor, John B. 2007. *Global Financial Warriors: The Untold Story of International Finance in the Post-9/11 World.* New York and London: W. W. Norton.
Truman, Edwin. 2003. The Limits of Exchange Market Intervention. In *Dollar Overvaluation and the World Economy,* ed. C. Fred Bergsten and John Williamson. Washington: Institute for International Economics.
Truman, Edwin, ed. 2006. *Reforming the IMF for the 21st Century.* Washington: Institute for International Economics.
Williamson, John. 1983. *The Exchange Rate System.* Washington: Institute for International Economics.
Williamson, John. 1994. *Estimating Equilibrium Exchange Rates.* Washington: Institute for International Economics.
Williamson, John. 1996. *The Crawling Band as an Exchange Rate Regime: Lessons from Chile, Colombia, and Israel.* Washington: Institute for International Economics.
Williamson, John. 2003. Exchange Rate Policy and Development. Paper presented at a conference of the Initiative for Policy Dialogue in Barcelona, Spain.
Wonnacott, Paul. 1958. Exchange Stabilization in Canada, 1950–54: A Comment. *Canadian Journal of Economics and Political Science* (May): 262–65.
Wren-Lewis, Simon, and Rebecca L. Driver. 1998. *Real Exchange Rates for the Year 2000.* Washington: Institute for International Economics.

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