

What Do Currency Crises Tell Us About the Future of the International Monetary System?

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I Introduction

Mexico may be the latest but it is not the last in the series of currency crises that have rocked international financial markets. A partial list of recent episodes would include the sterling and lira crises in the summer of 1992, the year-long spasm that then afflicted the remaining ERM currencies, and the collapse of the Mexican peso - with reverberations felt throughout Latin America and Asia - early in 1995.

These crises share three characteristics. First, the necessity of a change in the exchange rate had been debated prior to the crisis but without any consensus being reached among analysts or in the market. Second, the attack on the currency, once it came, was overwhelming. It overpowered the authorities in a matter of hours, forcing them to withdraw from the market. Third, the exchange rate then fell further than required to effect the necessary correction. Once the dust had settled, the currency clearly had become undervalued.

Currency crises are not new. Nor is there much unprecedented about the feeling that markets can turn against a currency without reason and push it too far.¹ Still, the rapid pace of financial integration and liberalisation in recent years has led to a quantitative change in the speed with which markets move. Over the course of the 1980s, many industrialised countries shed their restrictions on the free international movement of financial capital. Developing countries followed their example in the 1990s. These developments, triggered in part by innovations in information processing and communications technologies which make restrictions on international capital movements more difficult to enforce, have created an environment in which the markets can quickly unleash massive speculative attacks.

1. Readers will find very similar criticisms of the operation of foreign exchange markets in, inter alia, Nurkse (1944).

Economists instinctively regard the liberalisation of international capital movements as a good thing. Like the removal of other restriction on the free play of market forces, international financial liberalisation allows resources to be allocated more efficiently. The integration of financial markets permits investment risks to be almost perfectly diversified. It expands the range of opportunities available to savers and investors in different countries, approaching the ideal in which savings are put to those uses in which their productivity is highest, regardless of the political jurisdiction in which investment takes place.

Curiously, academics and policy makers take a somewhat different view of the operation of domestic financial markets. While acknowledging markets' valuable allocatory role, they are virtually unanimous in agreeing to subject financial institutions and markets to prudential supervision. Intermediaries are required to calculate and maintain risk-adjusted capital ratios and to open their books to government inspectors. Stock markets are required to apply circuit breakers and have brokers impose margin requirements on their clients. Firms whose shares are publicly traded are required to apply standardised accounting practices and meet compulsory reporting requirements.

These regulations are motivated by problems of asymmetric information, insider trading, excess volatility and herd behaviour, and by the belief that large asset price movements can give rise to significant negative externalities. Foreign exchange markets, in contrast, remain wholly unregulated. And yet the experience of recent years makes it harder and harder to pretend that the characteristics that motivate the prudential supervision of domestic financial markets do not also apply to the market for foreign exchange.

In this paper we review what is known about exchange rate crises. We then draw out lessons for the choice of an exchange rate regime. The dilemmas of exchange rate management are particularly acute for small open developing economies. For them, freely floating exchange rates are not tolerable because their markets are thin, their exchange rates would be volatile, and their trade and production would be severely disrupted. But fixed exchange rates are not viable either because they would be highly susceptible to destabilising speculative attack. As a practical matter, such countries do not have available to them an exchange rate regime with the simplicity of a textbook model. In the short run, they will have to pursue a pragmatic policy that involves limited exchange rate management and the imposition of limited restrictions on capital movements. In the long run, they will face strong pressure to contemplate monetary unification with a larger neighbour.

Those larger neighbours, for whom international transactions are less important, will have little reason to contemplate stabilising their exchange rates against one another. This scenario points to eventual emergence of a world organised around three currency zones centred on the United States, Western Europe and Japan. Whatever measures countries take to reform their international monetary

arrangements in the meantime should be compatible with, or at least should not impede, this long-run tendency toward a tripartite monetary world.

II The Anatomy of Currency Crises

Together with Andrew Rose, we have studied exchange rate crises in a large sample of industrial countries spanning more than three decades.² From that analysis we draw four key conclusions.

1. *Exchange rate crises are not always associated with lack of fiscal discipline.* Contrary to popular assumption, countries whose currencies are attacked run do not always run significantly larger budget deficits in the preceding period. More commonly - but not always - the link is rather with excessive monetary expansion which leads to inflation, overvaluation and widening trade deficits.
2. *In some cases - in the EMS in particular - even this link between crises and monetary expansion is absent.* Especially for EMS currencies, but in a surprising number of other cases as well, speculative attacks are not foreshadowed by rapid monetary expansion.
3. *Successful and unsuccessful attacks differ surprisingly little.* The only clear distinction is that attacks are more likely to succeed when unemployment is high. This suggests that countries already in a weak position succumb to attack because they are unable politically to take remedial action.
4. *Capital controls have significant effects.* Notwithstanding scepticism about their enforceability, the evidence suggests that controls are effective in slowing the loss of reserves during speculative attacks.

From these findings a number of implications follow. First, governments which run budget deficits run the greatest risk of exposing their currencies to attack if those deficits are money-financed; bond-financed budget deficits are less likely to provoke speculative attacks. The implication is that the maintenance of a pegged rate regime or a system of bands like the EMS requires monetary policy coordination but not fiscal policy coordination.

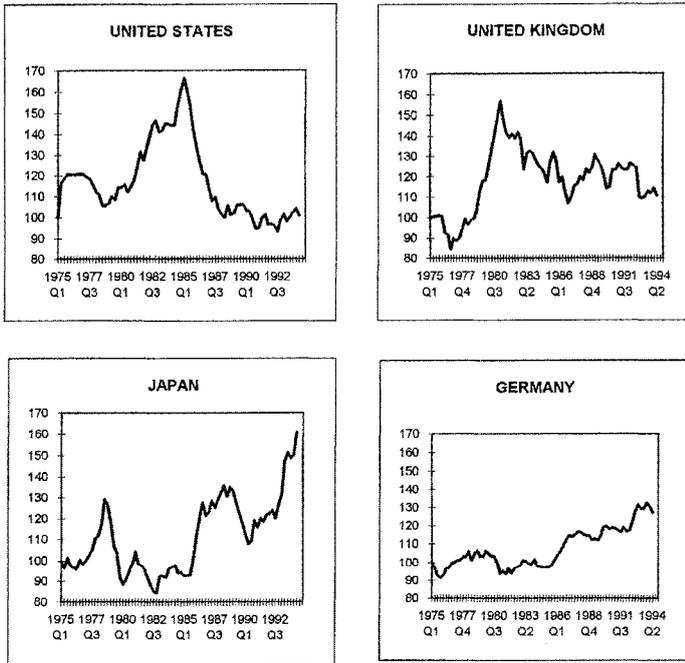
Moreover, crises appear to be of several varieties. While some are the consequence of the pursuit of monetary policies incompatible with the exchange rate peg, others are not obviously explicable in terms of macroeconomic fundamentals and seem to be triggered purely by the belief that a crisis is in the offing.³

Finally, the role of capital controls, while limited, can be crucial. Controls do not permit the indefinite pursuit of policies inconsistent with the exchange rate target, nor do they prevent speculative attacks and reserve losses. But they can make the difference between "1990s-style crises" which overwhelm the authorities

2. See Eichengreen, Rose and Wyplosz (1994, 1995a,b).

3. Models of self-fulfilling speculative attacks include Flood and Garber (1984), Obstfeld (1986, 1994), and Ozkan and Sutherland (1995).

Figure 1 Real Exchange Rates
(Relative Unit Labour Costs)



Source: International Monetary Fund

and lead to the collapse of the exchange rate regime, and “1980s-style crises” in which the authorities possess sufficient breathing space to organise orderly realignments and ensure the survival of the system.

III Choice of Exchange Rate Regime

A quarter century of experience since the collapse of the Bretton Woods System leaves no question about the volatility of floating exchange rates. The literature has shown beyond a shadow of a doubt that the rise in exchange rate volatility since 1971 has not been accompanied by a commensurate rise in the volatility of underlying economic fundamentals.⁴

In principle, day-to-day or month-to-month fluctuations pose few problems: it is easy and inexpensive to purchase forward and futures contracts that offer protection from exchange risk. The fluctuations that really matter are currency cycles

4. This is most convincingly shown by Rose (1994).

with a periodicity of five to ten years.⁵ Figure 1 serves as a reminder that changes of 50 to 100% in the exchange rates of the dollar, the yen and sterling have occurred over the course of a few years and persisted for considerable periods before being reversed.⁶ (Strikingly, the same is not true for the German mark, which is a member of the European Monetary System, or even sterling for the period when it participated in the ERM.) Fluctuations of this sort cannot be hedged. They can alter the pattern of trade in ways that persist even after the exchange rate fluctuation has been reversed. A 60% appreciation of the real exchange rate of the yen, as occurred between 1990 and 1995, is no problem if this reflects a permanent improvement in the productivity and competitiveness of the Japanese economy. But if there is no commensurate increase in Japanese competitiveness and the rise of the yen in the first half of the 1990s is then followed by an offsetting fall in the second half of the decade, as has happened before (recall the period of yen depreciation in 1987-90 following the “endaka episode” of 1985-86), then the dislocations to economic activity can be considerable. These costs take the form of factories closing down in one country and starting up in another, a process which may have to be reversed subsequently at considerable political and economic cost, or one which may endure due to hysteresis effects, resulting in a seemingly arbitrary and capricious shift in the location of employment.

What is a serious problem for large countries like those of Figure 1 can be intolerable for small open ones. Because a larger share of production in small countries is typically sold on international markets, the dislocations caused by exchange rate swings can be excruciating. Because the financial sector is small relative to global financial markets, a shift in market sentiment or in the level of interest rates in the United States can cause them to be flooded by capital inflows which lead to a dramatic real appreciation, or to experience massive outflows which cause the exchange rate to depreciate dramatically.

Yet fixing the exchange rate is not feasible either. Historical evidence clearly shows that speculative attacks on pegged exchange rates can occur for a variety of reasons, not all of which are justified by fundamentals. When they occur, attacks can be so powerful as to make it impossible to organise an effective defense. Increasingly, the response to attacks is to float the currency rather than to devalue and continue as before.⁷ In a world of liquid markets and efficient financial technologies (which continually reduce the costs of assuming speculative positions), there exist only two durable exchange rate regimes: floating which does not entail the pursuit of an explicit exchange rate target; and monetary unification (which

5. Gerlach and Petri (1990) contains an illuminating collection of studies adopting this perspective.

6. Evidence that temporary misalignments can have lasting effects on trade is provided by Baldwin (1988).

7. Examples include sterling and the lira in 1992, the abandonment of narrow ERM bands in 1993, and the Mexican peso in 1994-95.

eliminates the problem of the imperfect credibility of the exchange rate peg by eliminating the exchange rate itself).⁸ Intermediate regimes which involve explicit exchange rate targets (pegged but adjustable rates, target zones, currency bands, crawling pegs) invite attack and are at best temporary expedients to be maintained during the transition to these more durable arrangements. If there exist only two feasible options and these are extremes on the continuum between floating and monetary unification, small and large countries will tend to gravitate to the opposite ends of the spectrum. Large economies like the United States, Japan and Germany will continue to float against one another. Smaller economies for which the costs of floating are prohibitive will seek to establish a durable peg vis-à-vis a larger trading partner. The implication is that we are moving willy-nilly toward a world of three currency zones based on the dollar, the yen and the single European currency.⁹ If, as is likely, these currency zones are also trade blocs, they will constitute large and relatively closed economies which can afford the vagaries of real exchange rate fluctuations against one another.¹⁰ None of this is to suggest that this new architecture will emerge any time soon. Europe is only able to contemplate monetary unification after more than 40 years of progressive economic and political integration. And even there, considerable resistance remains to proceeding to monetary union because of objections about inadequate governance and accountability. A world of currency blocs will take time to evolve. The question then becomes how to best organise the long transition.

IV A Critique of Popular Proposals

Any scheme for international monetary reform should facilitate the gradual transition toward a world of stable currency zones. None of the alternatives that currently dominate discussion survives this litmus test.

1. *Free floating.* In the wake of recent crises, eminent economists, G-7 leaders, IMF officials and the stewards of the European Monetary System have

8. This point is argued by Eichengreen (1994). A currency board is an alternative to monetary unification, although we will argue momentarily that it is an attractive option only for a limited range of countries.

9. This is not to imply that these three blocs will approach the conditions for an optimum currency area in the short run. Recall Mundell's (1961) two criteria for an optimum currency area: relatively high levels of labour mobility, and symmetric aggregate supply shocks. Bayoumi and Eichengreen (1994) analyse the magnitude and correlation across a wide range of countries of aggregate supply and aggregate demand shocks. They identify a number of country groupings for which the correlation of shocks points to the feasibility of a zone of currency stability: parts of Western Europe, a Northeast Asian bloc (Japan, Korea and Taiwan), and a Southeast Asian grouping (Hong Kong, Indonesia, Malaysia, Singapore and Thailand).

10. What will happen to countries in Africa, Southern Asia and elsewhere that are left out of these groupings? For the time being, they may be able to peg behind the shelter of strict capital controls, but as they liberalise their financial markets, they will find that a pegged exchange rate is increasingly difficult to maintain. Their response will be to move toward greater exchange rate flexibility in the form of a heavily managed float.

embraced the idea of greater exchange rate flexibility. This fallback position merely reflects the recognition that pegged exchange rates are vulnerable to collapse; it is not an enthusiastic endorsement of the virtues of floating.¹¹ The risk is that the world will now undergo another swing of the pendulum between the proponents of fixed and floating rates. After another decade of painful experience with exchange rate fluctuations and misalignments, policy-makers will rediscover the costs of living with floating rates. The debate over reform will only have been delayed.

2. *Currency boards.* Other authors (Hanke, Jonung and Schuler, 1992) advocate going to the other extreme and fixing the exchange rate once and for all, by statute or constitutional amendment. Countries can establish a currency board, as Argentina and Lithuania have done vis-à-vis the United States and Estonia has done against Germany. But even a formal currency board arrangement may lack credibility in a politicised environment. A parliament that passes a currency board law can also revoke it if capital outflows threaten to exacerbate unemployment or bring down the banking system. The attack on the Argentine peso and the tremors felt in Hong Kong in the wake of the Mexican crisis illustrate this point.¹² Moreover, the costs of currency boards can be prohibitive in so far as they hamstring domestic lender of last resort activity. While currency boards will be attractive for countries which find floating impossible (because of the thinness of domestic markets or political obstacles to the pursuit of coherent policies) and may therefore become more prevalent as the viability of other forms of pegging continues to erode, due to the harsh constraints they impose on domestic policy autonomy, they are likely to be attractive only to countries in special circumstances.¹³
3. *Pegged but adjustable rates.* The difficulties with these extreme solutions motivate the search for compromise regimes that combine the advantages of fixed and floating rates. Thus, the Bretton Woods Commission (1994) recommended the return to a global system of adjustable pegs. This proposal can be dismissed quickly. The evidence clearly shows that such regimes are not viable in a world of political uncertainty and high capital mobility.
4. *Managed floating.* Other authors, also acknowledging the inadequacies of these extreme solutions, advocate managed floating as a compromise. There is no technical obstacle to this exchange rate regime; indeed, there is good reason to suppose that more and more countries, lacking viable alternatives, will move in the short run in the direction of managed floating. The question is whether the managed floating rate will display desirable properties. To increase the likelihood that this will be the case, Goldstein (1995) and others emphasise the

11. There are exceptions: see, for example, Shultz (1995).

12. Estonia and Lithuania are likely to encounter similar problems once their initial undervaluations are eroded by inflation.

13. These circumstances are detailed below.

need for better coordination of national macroeconomic policies and recommend the development of early warning systems designed to prevent serious, persistent misalignments.

While this objective is admirable, achieving it is easier said than done. An effective early warning system requires agreement on the danger to be warned against. Paul Revere's midnight ride, warning that "The British are coming, the British are coming", could not have taken place had he not known who the enemy was, and it would have been ineffective if his listeners had not shared his view of their identity. Warning against the danger of misalignment requires agreement on when the exchange rate is misaligned. If research on fundamental real exchange rates has established anything, it is that there exists no consensus on when the level of the exchange rate is appropriate.

Surveillance and early warning signals will accomplish nothing unless national authorities are prepared to adapt their policies in response. The problem here is that there is no such thing as an exchange rate policy per se; exchange rate policy is a by-product of monetary policy.¹⁴ The record of monetary-policy coordination among the G-3 countries gives few grounds for hope for significant improvement. The Plaza and Louvre Agreements could work because they exclusively entailed short-run intervention.¹⁵ Coordination over the longer term erodes monetary independence, which is a non-starter in large, relatively closed economies in which monetary policy is dedicated first and foremost to the pursuit of domestic objectives.

In any case, an early warning system is unlikely to operate with the speed and decisiveness of the markets. Every currency trader has an incentive to anticipate the actions of rivals. On the Executive Board of the IMF, in contrast, it is in the interest of participants to delay taking action until consensus is reached. If a systematic analysis of exchange rate crises, like that described in Section II, reveals few regularities in the behaviour of macroeconomic variables in the period leading up to crises, disagreement on the facts will frustrate efforts to reach agreement on whether and when the warning siren should be activated. This is particularly problematic in a setting where issuing the warning can have a seriously adverse impact on the government receiving it, and where the signal may actually provoke the crisis with which officials are concerned.

The Mexican crisis is a case in point. In a sense, warning signals - in the form of low savings rates, large current account deficits, and declining capital

14. The literature on sterilised intervention has not achieved a consensus on whether this technique, which permits the authorities to intervene in the foreign exchange market without altering monetary policy, has significant short-run effects, but its clear conclusion is that changes in monetary policy are required to alter the long-run evolution of exchange rates.

15. Since the targets and instruments were both short-term, that intervention could be sterilised without eliminating its effectiveness, leaving the stance of monetary policy unchanged.

inflows - had been flashing for a year. Yet there was no agreement on when the situation might become unsustainable or whether the authorities would still succeed in heading it off with modest adjustments in policy.¹⁶ Neither market participants nor the authorities anticipated the crisis that was ignited by what was intended to be an orderly realignment of the currency. Would things would have turned out differently had the IMF issued sterner warnings before the fact?

5. *Target zones.* Another compromise solution, due originally to Williamson (1985), seeks to combine the advantages of fixed and floating rates by establishing a system of target zones. Williamson's target zones would limit exchange rate flexibility by establishing a band of plus or minus 10% around a central parity. Those bands would be shifted before their edges were reached in the event of a fundamental disequilibrium (to use a phrase that is anachronistic but fitting). Soft buffers would allow the band to be pierced in the event of unjustified speculative pressure.

Soft buffers and frequent shifts of the band are crucial to the Williamson proposal, since they promise to avoid the one-way bets and build-up of speculative pressure that afflicts systems of pegged but adjustable rates. The problem they create is lack of credibility. Only when the authorities are prepared to defend the target zone and dedicate monetary policy to preventing the exchange rate from violating its limits will they enjoy the stabilising speculation that produces the "bias in the band" characteristic of target zone models (Krugman, 1991). But then their policy is susceptible to attack, requiring a defense that is expensive and ultimately unsustainable politically. Here as elsewhere in economics, there is no free lunch.

V Viable Options

The members of the European Union can finesse this problem by establishing a monetary union. Other large, relatively closed economies like the United States and Japan can afford to ignore it and allow their currencies to float subject to only occasional, discretionary intervention. Small open economies for which neither choice is feasible face a dilemma. Those in special circumstances may be attracted to currency boards. Typically, they will be very small (like the Cayman Islands), their banks will closely tied to institutions overseas and hence can expect foreign support (like Hong Kong), they will possess exceptionally underdeveloped financial markets (like Estonia), or they will have particularly lurid histories of inflation (like Argentina). But for the vast majority of developing countries, the costs

16. With the benefit of hindsight, of course, everyone insists that they saw the crisis coming, yet such admirable 20-20 hindsight was rarely exhibited before the fact. For an exception, see Dornbusch and Werner (1994).

of this arrangement, which takes the form of a total inability of the government to undertake lender of last resort intervention, will be prohibitive.

For want of an alternative, then, developing countries are likely to move in the short run toward some form of managed float. This trend is already under way: the percentage of developing countries which peg their exchange rates has been declining steadily over time. But systems of managed floating that entail an explicit band or target zone for the exchange rate will grow increasingly difficult to operate as international financial transactions are liberalised. Surges and sudden reversals in the direction of international capital flows will make the unilateral maintenance of an "orderly floating rate" progressively more difficult. Chile, Israel and a number of other industrialising economies have widened their exchange rate bands, and others are sure to follow. The next step in this evolution is movement toward a managed float in which there is no formal exchange rate target.

This is an uncomfortable situation which will obtain in the short run only because there is no viable alternative. In the long run, in contrast, governments are likely to be attracted to the idea of robust currency areas, in which they first commit themselves to providing multilateral support for one another's exchange rates and eventually contemplate monetary unification. The European example shows, however, that moving in this direction is both time-consuming and difficult. Because efforts at exchange rate stabilisation invite attack, even when limited to the regional level and supported by promises of multilateral support, they tend to be reversed or abandoned.

Additional measures need to be taken, therefore, to buttress the stability of exchange rates over the transition. The analogy with Stage II of the Maastricht process is direct. While the framers of the Maastricht Treaty foresaw a three-stage transition - a first in which national institutions and policies were reformed, a second in which exchange rates were held stable, and a third in which monetary union commenced - it proved impossible to peg intra-European rates within narrow bands during Stage II. This left two options for completing the transition to monetary union: jumping there directly from wide bands, or imposing the equivalent of foreign exchange transactions taxes to slow down the operation of speculative markets.¹⁷ Europe, because of its exceptional political solidarity and because the economic stakes - in the form of the Single Market - are so high, may yet succeed in navigating the second route.

Countries in other parts of the world, in contrast, have no choice but to follow a more evolutionary route. If they are to succeed in holding their exchange rates relatively stable and in cultivating the tradition of multilateral support that is a prerequisite for moving toward the creation of robust currency blocs, they will have to utilise special measures to insulate their financial markets from international capital flows. Following countries like Brazil, they might place a modest tax

17. We identified these options in an early article (Eichengreen and Wyplosz, 1993).

on, or require minimum holding period for, foreign purchases of domestic equities. They might require non-interest-bearing deposits at the central bank of domestic financial institutions borrowing or lending abroad. Thereby insuring themselves against volatile swings in the direction of international capital flows, they can partially insulate their exchange rates from serious disturbances. By giving themselves the breathing space needed to organise orderly realignments they may be able to maintain modest target zones. As in the EMS countries in the 1980s, such controls can support the operation of a system of reasonably stable rates.

This is a clear lesson of the Mexican crisis. Countries like Chile, Colombia, Brazil, Indonesia and Malaysia which adopted measures to restrict capital inflows avoided the splitting headache caused elsewhere by “tequila effect.” Similarly, during the 1992 EMS crisis, countries like Ireland, Spain and Portugal, which retained limited restrictions on capital outflows, managed to devalue and remain in the ERM, while countries like Italy, the United Kingdom and Sweden which retained no such controls were forced to abandon their pegs entirely.¹⁸

Speculative capital flows are motivated by the search for small capital gains whose annualised value is large because they can be obtained over a short span of time. A small tax on the value of each foreign exchange transaction (say, one per cent) can remove the attractions of a 10% devaluation expected with 20% probability.¹⁹ A tax equivalent can be levied unilaterally (by requiring those engaged in such transactions to make non-interest-bearing deposits with the government or central bank) or multilaterally (through the imposition of a global transactions tax).²⁰

Economists, trained to appreciate the magic of the market, are instinctively sceptical of such proposals. A few final observations help to place that scepticism in perspective. First, as observed above, there is no similar objection to regulation and prudential supervision of domestic financial markets. Second, the costs incurred by currency traders required to pay a one per cent tax are of the same order of magnitude as the costs incurred by importers and exporters of goods and services who pay to hedge exposure to exchange risk. Third, the losses incurred by governments and central banks who engage in futile efforts to defend a currency peg can be large and are borne by society as a whole.²¹ Fourth and finally, a one

18. Fieleke (1994) dismisses as ineffectual the capital controls applied by Ireland, Spain and Portugal in 1993 on the grounds that “all three countries were obliged to devalue within months after imposing or intensifying controls.” Leaving aside whether these countries’ controls were well-designed, this criticism misses the point that these three countries were well able to realign and stay in the ERM, whereas countries that did not apply controls, like Italy and the United Kingdom, were driven out of the system.

19. The expected value of the transaction is 2% ($10\% \cdot 0.2$), which is exactly offset by a 1% tax paid on each leg of a round trip.

20. The issue of implementation raises a number of practical issues which space does not permit us to address here. See Eichengreen, Tobin and Wyplosz (1995) for an extended discussion.

21. For example, in defending the krona in the autumn of 1992, the Riksbank spent a staggering US\$3,500 for each Swedish citizen. Bank for International Settlements (1993), p.188.

per cent tax on currency transactions will do more to discourage short-term speculative round-tripping than long-term foreign investment; amortised over the long horizon relevant to productive investments, the costs of such measures is negligible.

VI Conclusion

It is important to stress what this argument does not imply. Capital controls are not a long-run solution to currency crises. What must be eliminated is the crises themselves. This can be achieved by letting the exchange rate float or by eliminating it entirely. The first option fits economies which trade little with other countries. The second fits small open economies that trade heavily with a particular partner. If both groups respond as predicted, we should see the emergence decades down the road of an international system organised around a triad of currency zones. Most proposals for international monetary reform hold out little promise because they fail to acknowledge and accommodate these tendencies. Some advocate floating without realising that this is not a feasible long-term solution except for large, relatively closed economies like the United States, Japan and the European Union, and that an interlude of exchange rate volatility will only delay the eventual transition to a world of stable currency zones. Others advocate pegging without admitting that this will only consign countries to chaos comparable to that which recently afflicted the countries cited in our opening paragraph. Our proposal, in contrast, recognises that there are both economic and political arguments for a world of three stable currency zones and that in other parts of the world, as in Europe today, special steps may have to be taken to arrive there.

References

- Baldwin, Richard, "Hysteresis in Import Prices: The Beachhead Effect," In: *American Economic Review* 78, 1988, pp. 773-785.
- Bank for International Settlements, "63rd Annual Report", Basle: BIS, 1993.
- Bayoumi, Tamim and Barry Eichengreen, "One Money or Many? Analyzing the Prospects for Monetary Unification in Various Parts of the World," Princeton Studies in International Finance no. 76, International Finance Section, Department of Economics, Princeton University, 1994.
- Bretton Woods Commission, "Bretton Woods: Looking to the Future", Washington DC: Bretton Woods Commission, 1994.
- Dornbusch, Rudiger and Alejandro Werner, "Mexico: Stabilization without Growth," Brookings Papers on Economic Activity 1, 1994, pp. 253-313.
- Eichengreen, Barry, "International Monetary Arrangements for the 21st Century", Washington, DC: The Brookings Institution, 1995.

- Eichengreen, Barry, Andrew Rose and Charles Wyplosz, "Speculative Attacks on Pegged Exchange Rates: An Empirical Investigation with Special Reference to the European Monetary System," In: Matthew Canzoneri, Paul Masson and Vittorio Grilli (eds.), *Transatlantic Economic Issues*, Cambridge: Cambridge University Press, (forthcoming).
- Eichengreen, Barry, Andrew Rose and Charles Wyplosz, "Is There a Safe Passage to EMU? Evidence from the Markets," In: Jeffrey Frankel and Alberto Giovannini (eds.), *The Micro-Structure of Foreign Exchange Markets*, Chicago: University of Chicago Press, (forthcoming).
- Eichengreen, Barry, James Tobin and Charles Wyplosz, "Two Cases for Sand in the Wheels of International Finance," In: *Economic Journal* 105, 1995, pp. 162-172.
- Eichengreen, Barry and Charles Wyplosz, "The Unstable EMS," *Brookings Papers on Economic Activity* 1, 1993, pp. 51-143.
- Fieleke, Norman S., "International Capital Transactions: Should They Be Restricted?" In: *New England Economic Review* (March/April), 1994, pp. 28-39.
- Flood, Robert P. and Peter Garber, "Gold Monetization and Gold Discipline," In: *Journal of Political Economy* 92, 1984, pp. 90-107.
- Gerlach, Stefan and Peter A. Petri (eds.), *The Economics of the Dollar Cycle*, Cambridge, Mass.: MIT Press.
- Goldstein, Morris, "The Exchange Rate System and the IMF: A Modest Agenda", Policy Analyses in International Economics no. 39, Washington, DC: Institute for International Economics, 1995.
- Hanke, Steve H., Lars Jonung and Kurt Schuler, *Russian Currency and Finance: A Currency Board Approach to Reform*, London: Routledge, 1993.
- Krugman, Paul, "Target Zones and Exchange Rate Dynamics," In: *Quarterly Journal of Economics* 106, 1991, pp. 669-682.
- Mundell, Robert A., "A Theory of Optimum Currency Areas," In: *American Economic Review* 51, 1961, pp. 657-665.
- Nurkse, Ragnar, "International Currency Experience," Geneva: League of Nations, 1944.
- Obstfeld, Maurice, "Rational and Self-Fulfilling Balance-of-Payments Crises," In: *American Economic Review* LXXVI, 1986, pp. 72-81.
- Obstfeld, Maurice, "The Logic of Currency Crises," NBER Working Paper No. 4640, 1994.
- Ozkan, F. Gulcin and Alan Sutherland, "A Model of the ERM Crisis," CEPR Discussion Paper No. 879, January 1994.
- Reinhart, M. Carmen and R. Todd Smith, "Capital Controls: Concepts and Experiences," In: David Folkerts-Landau and Takatoshi Ito (eds.), *International Capital Markets: Developments, Prospects and Policy Issues*, Washington, DC: International Monetary Fund, 1995.

- Rose, Andrew, "Are Exchange Rates Macroeconomic Phenomena?" In: *Federal Reserve Bank of San Francisco Economic Review* 19, 1994, pp. 20-30.
- Shultz, George P., "Economics in Action: Ideas, Institutions, Policies," In: *American Economic Review Papers and Proceedings*, May 1995.
- Williamson, John , "The Exchange Rate System," Policy Analyses in International Economics no. 5, Washington, DC: Institute for International Economics, 1985.