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THE EMS CRISIS IN RETROSPECT

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ABSTRACT

This paper reconsiders the 1992-3 crisis in the European Monetary System in light of its emerging market successors. That episode was a predecessor of the Mexican and Asian crises in the sense that both capital movements and domestic financial fragility played important roles. The output effects of this currency crisis resemble those of the typical emerging market crisis as much as they do the moderate effects of the typical industrial-country event of its kind to take place in an environment of fully free capital mobility. “Leading indicator models” constructed using data from the Tequila and the Asian flu are shown to do a surprisingly good job at “backcasting” which European countries suffered currency instability in 1992-3, although these models also point to what was distinctive about the European case.

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The Mexican crisis was not the first currency and financial crisis of the 1990s. Two years earlier, Europe had endured an equally dramatic crisis of its own. In September of 1992, the lira and sterling were driven from the Exchange Rate Mechanism of the European Monetary System. The peseta, the escudo, and krona (not officially a member of the EMS but pegged to the Ecu) suffered the same fate two months later. Early in 1993, Spain and Portugal, together with Ireland, were forced to devalue again due to another surge of speculative pressure. By the summer, when market participants turned their attention to France, the fate of the EMS and of Europe's monetary unification project hung in the balance.

Europe is different from Latin America, a point so obvious that it hardly bears stating. Europe's developed, diversified economies are less volatile. Its financial markets are deeper. Its governments and firms have the reputation and capacity to borrow at long term in their own currencies. Above all, there is a commitment to political integration and monetary cooperation unlike any which exists in other parts of the world. The credibility of this commitment — while it could and was doubted in 1992 — is of an entirely different sort than any which has so far developed in Latin America or, for that matter, Asia.

Despite these differences, many of the debates provoked by the EMS crisis will resonate

with those acquainted with its emerging-market successors. There is the debate over fundamentals (real overvaluation, excessive deficits, excessive rates of money and credit growth) versus destabilizing shifts in investor sentiment in the outbreak of the crisis. There is the debate over the importance of imbalances in the crisis countries themselves versus shocks from outside (in the European case the German unification shock, in the Mexican case the U.S. interest rate shock). There is the debate over the role of capital-account liberalization in heightening financial risks (most of Europe's capital controls having been removed in the years leading up to the crisis). There is the role of highly-leveraged institutions. And there is the importance of banking-sector problems in limiting resort to interest-rate increases to defend the currency. Replace "Europe" with "Latin America" (or, for that matter, "Asia"), and the same debates can be seen to apply.

Above all there are the lessons of the EMS crisis for monetary and exchange-rate policies. My own reading, it will not surprise those who know me, is that Europe's experience underscores the difficulty of pegging exchange rates in a world of high capital mobility and establishes the existence of but two viable options for countries seeking to reconcile financial stability with financial openness: monetary unification, which was achieved in Europe through the creation of a new currency and a transnational central bank but will more likely be achieved in Latin America through dollarization; and a more freely floating exchange rate anchored by a clear and credible monetary policy strategy, namely, inflation targeting. While the 11 founding members of what is now the euro area gradually hardened their exchange rate pegs before taking the leap to monetary unification, other European countries, notably the UK and Sweden, continue to float and to target inflation. Europe's experience thus suggests that both floating and dollarization may have a future in Latin America as well.

1. The Context

Every crisis has its context. What was distinctive about Europe's was the depth of the commitment to stabilizing exchange rates. The "quest" for exchange rate stability (as Giavazzi and Giovannini 1989 put it) was rooted in a desire for monetary and financial stability, which is hardly unique to Europe, but also in a commitment to economic and political integration. From the 1950s, integration was the organizing principle for Europe's international relations. The integrationist agenda always had an economic component, starting with the creation of a European customs union in the 1960s and culminating with the agreement to forge a Single Market in 1986. It always had a political component, as reflected in the creation of the European Parliament, the European Court of Justice, and the European Commission.

Monetary integration was tied to both of these elements. It was integral to economic integration, for exchange rate volatility threatened to wreak havoc with competitive advantage and to erode political support for the customs union.² Exchange rate changes disrupted the operation of the Common Agricultural Policy, the European Community's first concrete achievement.³ With the move from customs union to Single Market, arbitrary and capricious exchange-rate changes threatened to produce even larger shifts in the direction of trade and to

²This refers to the "competitive-devaluation problem," which was of singular concern in Europe, owing to the association of currency devaluation with political strife in the 1930s.

³While the European Coal and Steel Community was the first achievement of "The Six," it predated the Treaty of Rome. In any case, the CAP was essential for maintaining political support, notably in France, for the Common Market in whose construction the Coal and Steel Community was the first step. And, as Buiter, Corsetti and Pesenti (1998) argue, it is hard to imagine that the technical features of the CAP would have been designed as they were unless there had been a presumption that intra-European exchange rates would remain fixed. Even so, one can readily see how with the passage of time those technical features could themselves become an obstacle to exchange rate variability.

provoke an even larger backlash. More even than in NAFTA, where integration largely stops at the border, European initiatives extending well beyond the removal of border controls to the creation of a single labor market and a single financial market caused exchange rate fluctuations and economic integration to be seen as incompatible.⁴

Monetary integration was also the vehicle for pushing forward political integration. The formulation and implementation of a single monetary policy required new institutions and deliberative bodies, facilitating the institutionalization of cooperation. Starting with the Werner Report in 1970, monetary policy was the lever used to pry open the door to political integration, and, predictably, the strongest opposition to the monetary project (as in the United Kingdom) came from committed anti-federalists. To say that monetary integration was a concomitant of political integration may be too simple, but it is impossible to imagine a European monetary project which took the form it did in the absence of the political motor.

The collapse of the Bretton Woods System in 1971-3 and the resulting volatility in financial markets heightened the urgency of efforts to create a zone of monetary stability. Europe's first attempt, the Snake, was less than successful. The success of the next initiative, the EMS, a multilateral parity grid established in 1979, surprised even the optimists. In retrospect, the ingredients of this success are clear. Compared to the Snake, the EMS provided for more

⁴To be sure, NAFTA includes a number of non-trade-related provisions that extend beyond the border — those affecting environmental standards and practices, for example — but these are limited compared to the commitments entailed in the Single Market program.

liberal credit lines.⁵ It was supported by a firmer political commitment.⁶ The global environment was more favorable; none of the shocks of the 1980s was as severe as the first oil shock and the productivity slowdown of the 1970s.⁷ France's commitment to price stability having come under a cloud as a result of President Mitterrand's abortive Keynesian experiment in 1981-3, Germany emerged as the anchor for exchange rate and inflation expectations. Moreover, there was a greater willingness to harmonize policies once governments absorbed the lessons of the Mitterrand's failed effort to go it alone.⁸ And since there was provision for realigning ERM currencies, policy harmonization did not consign governments to a macroeconomic strait jacket. There was a readiness to coordinate those realignments, which could be negotiated in advance courtesy of the breathing space provided by capital controls. These were the elements that sustained the EMS through its first seven years of operation.

Then came the Single Market agreement in 1986. An essential step toward creating a single capital market was the removal of controls on cross-border capital flows. The implications of doing so for the narrow-band EMS were not fully appreciated. With the removal of capital controls over the subsequent five years, realigning became problematic. The merest hint that the authorities were contemplating a change in parity could prompt the markets to launch a

⁵The maturity of credits that could be obtained through the Very Short Term Financing Facility was extended, the conditions under which they could be accessed was liberalized, and provision was made for renewing maturing loans.

⁶Where the Snake had included non-EC members, the EMS was exclusively an EC affair.

⁷Bayoumi and Eichengreen (1994) document this point with estimates of the supply and demand shocks affecting the European economy in the 1970s and 1980s.

⁸Italy, Denmark and Ireland, among others, followed France's lead, turning to monetary and fiscal retrenchment.

preemptive strike. Hence the option could no longer be discussed in polite company. Where there had been 11 realignments between the birth of the EMS and January 1987, there were none from that point to the crisis in 1992.⁹ Commentators (e.g. Giavazzi and Spaventa 1990) began to distinguish between the Old (flexible) and New (rigid) EMS.

The EMS was then buffeted by far-reaching changes to the global economy. There was the growth of international financial transactions, most notably after the Brady Plan allowed banks to write down and sell off their nonperforming loans to developing countries. There was the deregulation of financial markets, the surge in bank lending, and the growth of financial institutions that fed on this credit, notably macro hedge funds that lacked long-term relationships with the governments of the countries whose currencies they traded. There was the Soviet collapse and German unification. The impact of German unification on the European economy was not hard to anticipate. Early analysts like Begg et al. (1990) hit the nail on the head, forecasting strong domestic demand fueled by deficit spending and high interest rates as the Bundesbank sought to limit the inflationary consequences.¹⁰ But if the macroeconomic effects were foreseen, the consequences for the EMS were not.

⁹The band for the lira was adjusted on January 8, 1990 but without changing the central parity and therefore posing no threat to the stability of expectations.

¹⁰Because Chancellor Kohl had campaigned on a pledge not to levy additional taxes to defray the costs of unification, forecasting large budget deficits and their consequences was not rocket science.

2. The Crisis

Those consequences showed up first in Finland, not a member of the EMS (since Finland was not yet a member of the EU) but an Ecu pegger. Finland's exports were hit by the disintegration of the Soviet economy. Its banks and firms were heavily exposed as a result of the credit boom that had followed financial liberalization in the mid-1980s, and rising German and European interest rates then made it more difficult for them to fund their operations. The magnitude of the problem became apparent in late 1991, when the Bank of Finland devalued the markka by 12 per cent but this adjustment turned out to be woefully inadequate to restore the health and vigor of the Finnish economy.

Similar problems afflicted other European countries. There were questions about the competitive position of Italy and the UK. Italy, like a number of other EU member states with recent histories of inflation, had used the EMS as a way of importing the Bundesbank's anti-inflationary credibility. As in any exchange-rate-based stabilization, not just current inflation but also the cumulative effects of past inflation were built into the price level, creating problems of overvaluation. Since inflation stabilized less rapidly than the exchange rate, interest rates were also slow to come down. Investors borrowed in low-interest-rate markets (Japan and the United States) and invested where interest rates were high on the assumption that ERM pegs were firm.¹¹ These inflows fueled bank lending and domestic credit expansion; they papered over problems. The label attached to this process may have been "the convergence play" rather than "the carry trade" (the 1990s variant to gain infamy as a result of the Mexican and Asian crises), but the

¹¹And that these investments would deliver capital gains as interest rates came down in the future.

mechanism was fundamentally the same.¹² And if doubts arose about the stability of exchange-rate pegs, these convergence plays could be quickly unwound.

In Britain, the problem was having entered the EMS at an unsustainably high exchange rate. The pound had appreciated, despite inflation, with the country's macroeconomic boom, and recession and unemployment loomed just as sterling went into the EMS.¹³ Indeed, concern over unemployment was continent wide: together with the weakness of banking systems, it raised the question of whether central banks and governments had the will to defend their exchange rates if they came under attack.

If governments chose to stay the course, this would be for political reasons and in the belief that defending the EMS was essential to the survival of the monetary union project. The Delors Report, accepted by the Council at the Madrid Summit in June 1989, and the Maastricht Treaty, negotiated in 1991 but not yet ratified, raised the stakes. The Maastricht Treaty made participation in the EMS, with no involuntary devaluations, a precondition for qualifying for EMU.¹⁴ Countries displaying an inadequate commitment to defending their currencies might be barred from joining the monetary union, thereby jeopardizing their standing as good Europeans.

¹²Thus, the Spanish peseta, like the Indonesian rupiah five years later, was pushed to the top of its band by these copious capital inflows before the bottom suddenly fell out.

¹³It is revealing that, at the time of writing, sterling is some 15 per cent higher against the DM than it was when it entered the ERM (and even higher against the synthetic euro). This is consistent with the emphasis in the text on the influence of the business cycle conjuncture on the level of the exchange rate, in the sense that Britain's relatively robust expansion in the second half of the 1990s is the obvious explanation for its currently high exchange rate.

¹⁴Exchange rate stabilization and EMS participation was one of the four convergence criteria included in the Maastricht Treaty although how strictly they would be interpreted was disputed. For understanding the crisis, it is important to recall that the consensus interpretation was stricter than it tends to be today.

When Danish voters narrowly rejected the treaty in their June 2nd referendum, this presumption was shattered. If there might be no monetary union to aspire to, there was less incentive to pursue painful policies of austerity. Financial markets quickly recognized the implications. Italy, the where competitiveness problems had built up as a result of chronic inflation, became an obvious target. Despite not straying from its EMS band since it had been narrowed from 6 to 2 1/4 per cent in January 1990, the lira now fell to its lower limit.¹⁵ The Bank of Italy hiked interest rates, but to no avail; the markets were more alarmed by the implied increase in debt service than they were reassured by the signal of commitment.¹⁶ The three currencies still operating the wide band (sterling, the peseta and the escudo), whose credibility was least, weakened in response.¹⁷

The pressure mounted with the approach of the French referendum scheduled for September 20th, since another rejection of the treaty would leave monetary unification dead in the water. On August 26th the pound fell to its ERM floor despite Bank of England intervention. Within 48 hours it was joined there by the lira. The effort to negotiate a coordinated response (a devaluation of the weak ERM currencies -- essentially all of them except the DM and the Dutch guilder -- the Netherlands being regarded by the markets as just another German lander -- together with a reduction in German interest rates) at an ECOFIN meeting in Bath in early

¹⁵Despite intramarginal intervention. The Bank of Italy's reserves fell by 13 1/2 per cent in the month of June.

¹⁶Connolly (1995), p.136.

¹⁷New entrants to the EMS, following a precedent set by Italy, were initially permitted to operate wide bands of plus-or-minus six per cent (rather than the conventional 2 1/4 per cent band), reflecting their continued problems of high inflation. Italy moved from the wide band to the narrow band on January 8, 1990, as noted above.

September went badly wrong. Germany, preoccupied by inflation, refused to reduce interest rates, while France, Britain and Spain, fearing the consequences of association with Italy, avoided all discussion of a general realignment of ERM currencies as a precondition for looser German monetary policy. The prospects for cooperation dimmed.

The consequences became apparent on September 8th, when Finland abandoned its peg and the markka depreciated by 15 per cent. The size of the drop implied large potential profits if other weak European currencies responded similarly, prompting traders to turn to neighboring Sweden, which superficially resembled its Nordic neighbor. Over the subsequent week the Riksbank, to defend the Ecu peg, raised its marginal lending rate to triple digits. The Bank of Norway supported the krone with very extensive intervention. Despite raising short-term interest rates to more than 30 per cent, the Bank of Italy found its reserves on the verge of exhaustion. The formula presented at Bath -- a general realignment coupled with a German interest-rate cut -- was run up the flagpole again, but once more ERM members failed to salute. Following bilateral negotiations with Germany, Italy devalued the lira by 7 per cent on September 13th, and the Bundesbank lowered its Lombard rate by 25 basis points.¹⁸

This tale of mounting tensions, culminating in the inevitable tragedy, is told with benefit of hindsight. Europe's exchange rate pegs were fragile, reflecting a combination of macroeconomic imbalances and structural weaknesses. Governments and central banks had a limited political capacity to defend their currencies. And the monetary union project had uncertain prospects. It is no surprise, in retrospect, that currency speculators trained their attention on the EMS or that

¹⁸Technically, the adjustment was a 3.5 devaluation of the lira and a 3.5 per cent revaluation of other ERM currencies. The Bundesbank also cut the discount rate by 50 basis points, but it was the Lombard rate that mattered for international transactions.

their campaign ultimately succeeded.

The aura of inevitability surrounding this account makes it important to recall that this outcome seemed far from assured at the time. Many years had passed since ERM parities had been changed. The commitment to monetary union continued to shape official decisions, Danish referendum or not. Measures of market expectations, whether the forward exchange rate (as in Eichengreen and Wyplosz 1993), trend-adjusted measures of realignment expectations (as in Rose and Svensson 1994), or realignment probabilities derived from options prices (as in Campa and Chang 1996) suggest that no significant likelihood was attached to realignment until the weeks immediately preceding the crisis.

September changed this. The first realignment in five years reminded observers that the devaluation of European currencies was still possible. The refusal of other countries to agree on a simultaneous realignment against the DM and the Bundesbank's reluctance to cut interest rates by more than a small margin intensified the pressure on Europe's weak currencies. This was the point at which George Soros' positions against sterling became known (Muehring, 1992). The news on Tuesday, September 15th that the German newspaper *Handelsblatt* would the next day publish an interview with Bundesbank President Schlesinger saying that "further devaluations could not be excluded" and the absence of a firm rebuttal by the German central bank ratcheted up the pressure. The British government and the Bank of England hesitated to raise interest rates, apparently fearing that further hikes would aggravate unemployment and incite a rebellion in the Conservative bank benches.¹⁹ At the height of the speculative attack, on Wednesday 16

¹⁹As Stephens (1996, p.217) writes, "...officials believed an increase would have served only to heighten the tension between the domestic economy and the ERM. The financial markets would have recognized an increase as an act of desperation. In the words of one Bank official,

September, the Bank raised its base lending rate from 10 to 12 per cent and announced the intention of raising it by a further 300 basis points the following day. But the first increase was delayed by more than an hour following the opening of the markets and was in any case a feeble response by the standards of, say, the Riksbank. It had no discernible impact on the currency.²⁰ Doubts took hold even before the second increase was implemented; it was quickly rescinded. That evening EC Monetary Committee accepted Britain's request to take the pound out of the ERM (and did the same for Italy and the lira) but rejected London's request to suspend the ERM entirely.²¹ In addition, the Monetary Committee then authorized a five per cent devaluation of the peseta.

From this point, no ERM currency (other than the deutschmark and the Dutch guilder) was immune. The Bank of France was forced to raise interest rates, despite French voters' ratification of the Maastricht Treaty. The French central bank spent \$32 billion on the franc's defense in the week ending September 23rd. Sweden abandoned its Ecu peg on November 19th, following reserve losses of \$26 billion (more than 10 per cent of Swedish GNP) in the preceding 6 days.²² Denmark was forced to raise interest rates, followed by Spain and Portugal, and after three days the peseta and escudo were devalued by (in the Spanish case, a further) 3 per cent.

'There was a huge overkill even with base rates at 10 per cent. Increasing rates would have been incredible.'" See also Lamont (1999), p.200 and *passim*.

²⁰As Norman Lamont put it, when the increase was announced "the pound did not move at all. From that moment, I knew the game was up. I later told a journalist I felt like a TV surgeon in *Casualty* watching a heart monitor and realizing that the patient was dead..." (Lamont 1999, p.249).

²¹Dyson and Featherstone (1999), p.685.

²²BIS (1993), p.188.

Norway abandoned its Ecu peg on December 10th, and Ireland devalued by 10 per cent within the ERM on January 30th.

While the Danish krone and Belgian franc also came under attack in early 1993, the center of attention was now Iberia. Spanish unemployment had risen to 20 per cent. The release in mid-February of disappointing unemployment figures for the final quarter of 1992 ignited selling pressure, and the calling of elections for April 12th created uncertainty about the intentions of the government. Reserve losses forced another 8 per cent devaluation on May 13th, and the spillover to neighboring Portugal forced that country to devalue by another 6 ½ per cent.

Investors now had France in their sights. French unemployment had been a concern throughout the period. It placed the French government under pressure not to raise interest rates to defend the franc and the German government under pressure to lower them to support its Gallic neighbor. On June 24th the French economy minister, Edmond Alphandery, demanded a meeting with his German counterpart, Theo Waigel, for the purpose of coordinating reductions in German and French interest rates; Waigel, citing pressing business, declined. When INSEE released a gloomy report on the French economy, the franc crumbled. On July 14th it approached its maximum permissible divergence against the DM, forcing the Bundesbank to intervene. But on the last Thursday of the month, at its final regular meeting of the summer, the Bundesbank Council declined to lower the discount rate (citing recent German money supply figures which showed that money supply targets had again been overshoot).²³ Massive market sales of francs prompted equally massive purchases by the Bank of France (which expended more than \$32 billion of reserves in the last week of July -- 80 per cent of this on July 29th, the last trading day of

²³The Bundesbank cut repurchase and lombard rates but this was regarded as inadequate.

the month). The Bundesbank's reserves, meanwhile, rose by DM 40 billion (some 33 per cent), again foreshadowing a sharp increase in the money supply.

By now the writing was on the wall. The Bank of France lacked the reserves to continue intervening, and for the Bundesbank to do so threatened its anti-inflationary objectives. For the same reasons, neither central bank was prepared to alter interest rates. In a crisis meeting over the last weekend of July, Europe's central bank governors and finance ministers widened the ERM's bands to 15 per cent. Only time would tell whether this decision was compatible with the Maastricht blueprint, but the impending opening of the Tokyo market (in just minutes when the decision was taken) left them no choice.

Turmoil in foreign exchange markets then subsided. Eliminating the one-way bet reduced speculative activity: since other currencies could now rise as well as fall against the DM within the wide band, the costs of losing a speculative bet were greatly increased. Eventually, reductions in German interest rates helped to reduce the pressure. And, perhaps most importantly, EU members reiterated their commitment to move ahead with monetary unification, Danish referendum or not; this meant that the disciplining effects on fiscal policy of the Maastricht convergence criteria would increasingly bite. So reassured, the markets settled down, and the crisis receded.

3. Two Interpretations

The debate over the causes of the crisis is typically framed in terms of first- versus second-

generation models.²⁴ In first-generation models (e.g. Krugman 1979), excessively expansionary macroeconomic policies pointing to the eventual exhaustion of reserves precipitate the speculative attack. In second-generation models (e.g. Flood and Garber 1994, Obstfeld 1986), the reverse is true: the attack precipitates the change in policies that validates the expectations of the exhaustion of reserves. The first generation can be thought of as modeling a current-account crisis. Excessively expansionary policies generate current account deficits that cannot be financed indefinitely; when financing becomes a constraint, the crisis erupts. In contrast, the second generation can be seen as modeling a capital-account crisis in which swings in the capital account first allow current-account deficits to be financed and then require them to be eliminated all at once through an uncomfortably large shift in relative prices.

The first interpretation points to the reluctance of the authorities to pursue policies consistent with the maintenance of their currency pegs. Budget deficits were large, and governments and central banks were reluctant to match the level of interest rates prevailing in Germany, against whose currency they were de facto pegging. The role of hedge funds and other currency speculators was to identify this problem, to foresee the eventual exhaustion of reserves, and to anticipate the inevitable exchange-rate adjustments.

The second interpretation, by comparison, attributes a more active role to the markets. Currency traders, in this view, “ganged up” on Europe’s central banks and governments. They forced the authorities to raise interest rates in order to defend their ERM parities. While maintaining those parities might have been tolerable under normal market conditions, this was no

²⁴I deserve the blame for having coined this terminology (in Eichengreen, Rose and Wyplosz 1995), which seems to have produced as much confusion as clarity.

longer true once confidence was lost and interest rates had to be jacked up disregard of existing economic difficulties. After enduring this battering for a few days, the Italian and British governments threw in the towel, allowing their currencies to depreciate.

The first round of post-crisis studies did not succeed in deciding between these two interpretations owing to the difficulty of giving empirical content to these theoretical constructs. A decade later we are unable to do much better. The gap between theory and empirics remains large. Any model will be over-determined in the sense that we have only one observation (the 1992 crisis) and any number of coefficients to estimate (each representing an different set of factors).²⁵ Nonetheless, I will suggest that a decade of discussion and rumination has led to the emergence of a synthesis combining elements of the current- and capital-account-based interpretations in something that approaches a consensus view.

4. A Current Account Crisis

The competitiveness interpretation should enjoy the benefit of the doubt if only because a number of countries (Italy and Spain prominent among them) had been following policies of exchange-rate-based disinflation.²⁶ Exchange-rate-based stabilization tends to aggravate problems

²⁵In a sense, this is what has led subsequent investigators to turn from case studies (like those commissioned by the Bank of Mexico for this conference) to “large n” studies that attempt to draw generalizations from many crises.

²⁶This characterization simplifies the situation, to be sure. In the case of the UK, another country whose subsequent difficulties have been ascribed to competitiveness problems, since 1988 the authorities had been resisting appreciation; in the two years preceding ERM entry they did not intervene nor use interest rates to target the exchange rate. Still, there is an element of truth in this characterization insofar as some of the principals in the discussion of alternative entry rates still saw inflation as more of a problem than competitiveness and therefore recommended a high rate.

of competitiveness. Even if pegging the currency accelerates the transition to price stability, inflation is still likely to take time to decline to the levels prevailing in the anchor country. And one or two points of extra inflation will cumulate to 5 to 12 points of overvaluation over a five-year period like that from 1987 to 1992.

In Europe's case, there were, in addition to the problems created by exchange-rate-based stabilization, the effects of fiscal stimulus, as governments sought to avoid importing recession from the U.S. and UK. Deficits as a per cent of GDP rose between 1991 and 1992 in 6 of 10 European countries. The exceptions were Germany, Italy, Spain and Portugal, where deficits were already large.²⁷ [See Table 1.]

In addition, there was the shock to competitiveness from a declining U.S. dollar. The dollar fell by nearly 20 per cent against the DM between April and August, reflecting interest-rate cuts by the Federal Reserve intended to jump-start recovery from the 1991-2 U.S. recession. [See Figure 1.] The lower dollar aggravated problems of competitiveness in Europe that were felt disproportionately by the continent's weak-currency countries.²⁸

It is worth emphasizing the contrast between this story and that told of the role of interest rates in the Mexican crisis. Whereas it was **falling** U.S. interest rates that aggravated Europe's

²⁷The last three countries entered the period with the largest deficits of any member state other than Greece, not yet an ERM member, and Germany itself, where the deficit had already soared in 1990-1.

²⁸Giavazzi and Giovannini (1989), writing before the crisis, refer to the widely-noted phenomenon of "dollar-deutschmark polarization," in which the deutschmark seemed to rise against other European currencies whenever the dollar fell. (See also Frankel 1986.) The popular interpretation was in terms of closer substitutability between dollars and deutschmarks than assets denominated in other European currencies. For present purposes, it suffices that a weaker dollar should have intensified the competitive pressure on all of Europe, which would have created particular problems for countries where the exchange rate was already weak.

crisis, it was **rising** U.S. interest rates that compounded Mexico's difficulties. Both stories can be correct, of course, if one believes that Europe's was predominately a current-account crisis (lower U.S. interest rates, leading to a lower dollar, undermined Europe's competitiveness on current account), while Mexico's was predominately a capital-account crisis (higher U.S. interest rates curtailed capital flows to Mexico, compressing the capital account).²⁹

Uncomfortably for the exponents of this view, widespread overvaluation was not evident to the naked eye. In part this reflects the limitations of the data. The wholesale and retail price indices (even the GDP deflators) on which estimates of competitiveness are based show little movement insofar as they are dominated by the prices of traded goods whose divergence is minimized by commodity-price arbitrage. Relative unit labor costs are more informative insofar as labor services are nontraded. [See Table 2.] For Italy, unit labor costs relative to the country's ERM partners rose by seven per cent between the advent of the New EMS and the onset of the crisis.³⁰ For Spain, the movement of relative unit labor costs was roughly the same, although the economy's shift in this period into the production of higher value added goods creates index-number problems and doubts about the figures. In the UK there was also a significant increase in relative unit labor costs from their end-1986 trough, though this predated sterling's 1990 entry into the EMS.³¹ For Sweden there is similar evidence for the second half of the 1980s.

²⁹And, of course, it is precisely over the question of whether the current or capital account drove the EMS crisis on which the first- versus second-generation debate turns.

³⁰As constructed by the IMF. Buitier, Corsetti and Pesenti (1998, p.43) note a 1992 Bank of Italy report estimating that the loss of Italian competitiveness between 1987 and 1991 was limited to 5 per cent. But this calculation was based on relative producer prices, which as argued above will be contaminated by a high weight on traded goods.

³¹As noted in Section 2.

But for no other European country do these indices provide evidence of real overvaluation. That Italy, Spain, the UK and Sweden were four of the first countries to feel speculative pressure tells us that the competitiveness story is important. But the absence of comparable evidence elsewhere is troubling for the first-generation story given the indiscriminate nature of the subsequent attacks.³²

These data may be less than informative, however, due to the German unification shock. Kohl's pledge not to raise taxes to finance the costs of unification, and the explosion of spending on unemployment benefits and pensions for residents of the Eastern *lander* (with the goal of limiting politically-sensitive migration to the western states), together with increased spending on infrastructure repair and environmental clean-up, stimulated demand in Germany. Given the disproportionate propensity of residents to consume domestically-produced goods, this fiscal-driven surge in demand required a rise in the relative price of German goods. This change in relative prices could come about in three ways. First, German prices could rise. But here the Bundesbank's aversion to inflation froze the mechanism. Second, altering exchange rates against the deutschmark could accomplish the task. But other countries were reluctant to change their parities, given the exchange-rate-based disinflation strategies they had been following and the Maastricht requirement to keep their currencies stable within the ERM. This left only a fall in price levels relative to the Germany's (equivalently, an inflation rate lower than Germany's) to bring about the requisite adjustment.

³²Of course, in the seminal Krugman model, excess demand did not show up in overvaluation, since relative prices were given by the assumption of purchasing power parity. Extensions of the model (e.g. Willman 1988) relaxed this assumption and showed how the run-up to a speculative attack driven by excess demand would display growing real overvaluation along with the progressive depletion of reserves.

This interpretation has been advanced by authors like Branson (1994) as a way of reconciling the competitive-imbalance story with the absence of a strong trend in relative inflation rates. While their logic is impeccable, it is hard to know how much importance to attach to the argument. In the absence of a fully-specified model, in other words, it is hard to know whether the observed movement in relative prices was inadequate. Eichengreen and Wyplosz (1993) consider the quantities affected by these relative prices — the current account deficit and manufacturing-sector profitability — and find that only in Italy did both variables deteriorate during the run-up to the crisis, unambiguously suggesting deteriorating competitiveness.³³

A second attempt to rescue the interpretation emphasizes the implications of the Danish referendum. Satisfying the convergence criteria of the Maastricht Treaty required eliminating excessive budget deficits and matching the inflation and interest rates of Europe's low inflation countries.³⁴ If the Maastricht Treaty was not going to be ratified, then the pressure was off, allowing governments and central banks to revert to their inflationary ways. Even if competitiveness problems were not yet evident, they would surface soon enough. In particular, countries where unemployment was high would not want to match the high level of German interest rates (and, by implication, the low level of German inflation). The normal behavior of their central banks would have been to reduce rates in the face of this unemployment (Clarida, Gali and Gertler 1997), and it was only the Maastricht promise of a reward that prevented them from doing so. As unemployment rose still further, the pressure for interest-rate reductions

³³Unfortunately, large capital inflows like those produced by the convergence play can render this test less than telling.

³⁴Or, more precisely, bringing inflation and interest rates down to a point very close to those of Europe's low inflation countries.

intensified. [See Table 3.] And as German interest rates ratcheted up, this tension ratcheted up with them. When “plucky little Denmark” (as Norman Lamont referred to the country) rejected the treaty, it cast doubt over the premise that countries that resisted the temptation to relax would reap a reward down the road. Traders, anticipating that governments were about to throw in the towel, sold off the currencies of Europe’s high-unemployment countries.

The problem with this interpretation is that there was no monetary explosion or loss of fiscal discipline following the Danish “nej.” Deficits may have been excessive, but this had already been true before the Danish referendum, and there was no change in fiscal stance subsequently.³⁵ [See again Table 1.] Although Denmark’s participation in the Maastricht process was now in doubt, other member countries remained as committed as ever.

These interpretations are more convincing if they can explain the timing of events. Timing certainly favors the Maastricht-based interpretation, given how volatility spiked with the Danish referendum. Yet European governments repeatedly reaffirmed their commitment to the Maastricht glidepath, and even the most forceful statements to this effect (and unchanging monetary and fiscal policies) did not make the volatility go away. It can be argued that their statements were not taken at face value, but only for Italy is there evidence of imperfect credibility in the behavior of asset prices.³⁶

Can German unification explain the timing? Buiter, Corsetti and Pesenti (1998, p.41) suggest that the Bundesbank held off raising interest rates in the hope that the German

³⁵I return to this point below.

³⁶In addition to the Rose and Svensson (1994) and Campa and Chang (1996) references cited above, see Clarida, Gali and Gertler (1997) for evidence.

government would show fiscal restraint, but by the second half of 1991 it had been overwhelmed by evidence to the contrary. When German inflation accelerated to four per cent (not an alarming figure for other countries but truly horrifying by German standards), it raised interest rates “regardless of the consequences for the domestic real economy and with utter disregard for the international implications of its policies.”³⁷ Clarida, Gali and Gertler (1997) argue on the basis of monetary policy reaction-functions that the Bundesbank pushed interest rates above predicted levels immediately before the EMS break-up; if so, this shock could explain the timing of the crisis. But their reaction functions under-predict interest rates over the entire preceding five years, not just in 1992.³⁸ This makes it hard to interpret the forecast errors for months immediately preceding the crisis.

Thus, this picture the ERM break-up as a current-account crisis (suitably amended for the German unification and Danish referendum shocks) takes us some way toward understanding the timing and character of events. Of course, this interpretation benefits from 20-20 hindsight. A sense of how things looked at the time can be gleaned from the October 1992 *World Economic Outlook* (IMF 1992), presented to the IMF Board on September 2-4. The WEO did not warn of real overvaluation, unsustainable current account deficits, or an impending crisis. Insofar as the markets and their monitors did not see problems as inevitable, one cannot help but feel that the preceding analysis is incomplete.

5. A Capital Account Crisis

³⁷Buiter, Corsetti and Pesenti (1998), p.41.

³⁸By a relatively small margin in 1990, but by roughly the same amount otherwise.

Completing the picture requires adding a role for the capital account. While the first half of the 1980s had seen EMS members devalue under pressure, the intensity of that pressure had been limited by controls. 1992 was the first occasion when the capital account was fully open, with implications for both the pre-crisis and crisis periods.

Recall that the Maastricht Treaty included a requirement that countries bring their inflation rates down to the levels prevailing in Europe's low-inflation countries in order to qualify for monetary union. The desire of Europe's inflation-prone countries not to be left on the platform when the train left the station encouraged the belief that they would take whatever steps were necessary for their inflation rates to converge to those prevailing elsewhere on the continent. And as their inflation rates came down, so would their interest rates.³⁹ This was the logic for the "convergence play."⁴⁰

To be sure, the convergence play was not entirely Maastricht related. Inflows into the higher-yielding ERM currencies had occurred over the 1987-1991 period that preceded the negotiation of the Maastricht Treaty (and the first half of which preceded the Delors Report). The success of countries in bringing down inflation in the context of their ERM-centered exchange-rate-based-stabilization strategies had set these inflows in train. Thus, capital inflows into both Italy and Spain tripled between 1986-88 and 1989-91. Interest rate spreads on one-year Eurocurrency deposits fell from 800 to 200 basis points. When the United Kingdom entered the ERM in October 1990, it too found itself on the receiving end of these financial flows. Banks and

³⁹In addition, recall that the convergence of interest rates was another precondition laid down in the Maastricht Treaty for qualifying for monetary union.

⁴⁰Subsequently made famous, in its post-crisis reincarnation, by Long-Term Capital Management.

firms funded themselves abroad, borrowing in deutschmarks and guilders. The IMF reported estimates of convergence plays as high as \$300 billion.⁴¹ Many of these were booked by hedge funds and other institutional investors who saw easy money to be made.

So far, our analysis includes no autonomous role for the capital account. The negative outcome of the Danish referendum affected the direction of capital flows only because it gave grounds for anticipating that policy would shift in a more expansionary direction. Capital flows simply responded to this prospective change in policy in this view; they did not precipitate it.

An autonomous role for capital movements enters if we consider the possibility that this policy shift was contingent on the level of interest rates. European governments were trading off the costs of maintaining the exchange rate, in the form of the high level of interest rates needed to defend it, against the perceived benefits of qualifying for monetary union down the road. The front-loaded costs increased with the slowing of economic growth.

The most obvious cost of high interest rates and a high exchange rate was the squeeze on industrial profitability and the high level of unemployment. In Sweden and Finland, in addition, the high exchange rate and high interest rates compounded the difficulties of a weak banking system and constrained the government in its pursuit of policies to resolve them. In Italy, a country with a debt/GDP ratio in excess of 100 per cent, a large portion of which ran short terms to maturity, a hundred basis point increase in the central bank's discount rate added 13 trillion lire to the budget deficit. Hence, high interest rates meant fiscal strains and difficult political choices. And in Britain, where mortgage interest rates were indexed and higher interest rates threatened to depress property values, monetary stringency provoked howls of protest as "[t]he bailiffs began

⁴¹IMF (1993), p.10.

arriving in the leafy avenues of the Home Counties and in the chic new developments of London's Docklands to repossess the homes of Thatcher's children."⁴²

Thus, a policy that was optimal in the absence of a loss of investor confidence could become suboptimal if capital flows reversed direction. If it became necessary to ratchet up interest rates to counter that loss of confidence, the terms of trade between unemployment now and EMU membership later would change for the worse. Governments previously prepared to accept the unemployment associated with the prevailing level of interest rates in return for the golden ring of EMU membership might no longer regard the game as worth the candle. They would abandon their ERM parities, reduce interest rates, and allow their currencies to depreciate. This is, as theorists refer to it, a model with multiple equilibria and contingent policy shifts, where the policy that is chosen depends on the direction of capital flows. And it is a model with an autonomous role for the capital account.⁴³

Clearly, not all countries were exposed equally to these pressures. It was those with high unemployment, weak banking systems, large amounts of short-term debt, and indexed mortgage rates for whom interest-rate increases were least tolerable, and which were presumably most inclined to abandon the exchange-rate commitment due to a sudden loss of confidence. In this sense, this interpretation is not an alternative to the current-account-centered analysis of the preceding section but a complement to it. The difference is that the fundamentals of interest are not just those related to international competitiveness (which now matters not just because it

⁴²Stephens (1996), p.190.

⁴³It has been set out formally by Ozkan and Sutherland (1994), Jeanne (1997), and Eichengreen and Jeanne (2000).

affects the current account but also because it feeds through into unemployment) but in addition others that heighten the economy's macroeconomic and financial fragility and thereby limit the steps that the politicians are prepared to take to defend the currency.

The role of the Danish referendum, so interpreted, was to move countries into this zone of vulnerability. The lure of monetary unification was so strong that governments were prepared to endure significant hardships to qualify for participation. But when the Danish referendum created a significant likelihood that monetary union would not happen, this bargain became less attractive. An interest-rate increase policy makers might have accepted previously on the grounds that it preserved their Maastricht-compliant status might no longer be tolerable now that the expected value of Maastricht good citizenship had fallen.

This interpretation can explain why countries like the UK, Italy, Sweden and Spain were first to be attacked: they had the highest unemployment rates, the worst recessions, the weakest banking systems, and the highest public debts. But it can also explain why speculators targeted the French franc, since French unemployment was high (and politically sensitive given the country's impending election). It can explain the reluctance of some governments (like that of the UK) to raise interest rates and the unwillingness of others (like that of Sweden) to hold them at high levels to defend their currencies. It provides a role for the Danish referendum in crystalizing skepticism about whether European governments were prepared to stay the course.

This interpretation has been challenged (by, e.g. Buiters, Corsetti, and Pesenti 1998) on the grounds that policy — monetary policy in particular — did not become more expansionary following the crisis. The Obstfeld (1986) model that is the basis for this tale of self-fulfilling attacks runs on the assumption that if (and only if) the currency is attacked, the peg will be

abandoned and policy will become more expansionary. The exchange rate will depreciate, providing ex post justification (and profits) for currency speculators. In fact, there is little evidence that policy in countries that abandoned their pegs shifted in more expansionary directions. Additional monetary ease was offset by additional fiscal retrenchment, leaving the thrust of macroeconomic policy unchanged. If speculators expected a significant relaxation of policy, they were disappointed.

It can be argued that this objection rests on too literal an interpretation of the Obstfeld model. An expansionary shift in policy was only one of several contingencies that could have driven the lira and sterling to lower levels after September 1992. Another, analyzed by Flood and Marion (1998), is a change in the exchange risk premium. Assume that a larger risk premium requires higher interest rates to maintain the previously prevailing peg. If the authorities refuse to raise interest rates following an increase in the risk premium, then the exchange rate will fall to lower levels. If the risk premium is an increasing function of the volatility of the exchange rate (which rose sharply in September 1992, as shown in Figure 2), then the fact that the exchange rate has suddenly fallen by a large amount and is now floating validates investors' expectations of a larger premium. The speculative attack that precipitated these events is rational and self fulfilling. And no change in monetary and fiscal policies is required.

This, then, is as close as we have come after a decade to a consensus interpretation of the crisis. Countries like Italy, the UK, and Spain would not have been so readily attacked had they not allowed their currencies to become overvalued. France would not have found it so difficult to defend the franc had its unemployment rate not risen to high levels, while Sweden and Finland would not have found defending their currencies so difficult had the condition of their banking

systems not been so fragile. The Bundesbank's interest-rate increases aggravated these strains. Still, there was nothing inevitable about the fact of the attacks, their timing, or their direction. The Maastricht process gave investors reason to believe that governments and central banks would strengthen their anti-inflationary resolve and put their houses in order before conditions became unsustainable. Capital thus flowed into these countries, courtesy of convergence plays. But if confidence was disturbed and flows reversed direction, countries in the zone of vulnerability — whose current account deficits were substantial, whose unemployment rates were high, whose public debts were large, and whose banking systems were weak — would lack the economic and political capacity to undertake the adjustments needed to reconcile the new financial circumstances with their prevailing currency pegs. The shock in question, it turned out, was the Danish referendum. And the rest, as they say, is history.

6. Did It Matter that the EMS was a Collective System of Pegs?

Europe was different in that it operated a system of collective currency pegs, in contrast to Mexico's unilateral peg before 1995 or Argentina's unilateral peg today. Buiter, Corsetti and Pesenti (1998) argue that a system of collective pegs, cooperatively managed, should be more stable than a unilateral peg, and that Europe's tragedy was that it squandered its opportunity to cooperate. This failure to cooperate was what transformed market pressures into a crisis; had cooperative policies been pursued, adjustment would have been smoother and the threat to the EMS would have been less.⁴⁴

⁴⁴ The implication is that regions prepared to develop collective exchange-rate arrangements and to operate them effectively (East Asia? Mercosur?) will be better able to resist future crises.

The logic of the Buitert et al. analysis is the following. While the Bundesbank was aware that its high interest rates were increasing the strain on the ERM's weak sisters — for present purposes, the lira and sterling — German authorities were unwilling to reduce interest rates unilaterally for fear of aggravating inflation. The resulting tension drove the lira and sterling out of the ERM, resulting in their substantial depreciation. The cooperative counterfactual is one in which a larger number of ERM countries — say, all but the Netherlands — realigned by a small amount against the deutschmark within the ERM, and Germany reduced interest rates.⁴⁵ This would have been incentive compatible for Germany, since the lower prices of goods imported from other European countries would have reduced inflationary pressures.⁴⁶ It would have allowed Italy and the UK to remain in the ERM following their realignment, since lower German interest rates would have strengthened their economies. And it would have been congenial to other European countries, since it would protected the ERM against the destabilizing shock of Britain and Italy's ejection. Thus, this cooperative solution would have averted the crisis that consigned Europe to another year of exchange market turbulence.

This bargain — a German interest rate reduction in return for a general realignment of ERM currencies — had been mooted at the Bath Summit, as noted above. John Major reports that Helmut Schleisinger acknowledged Germany's willingness to cut interest rates in conjunction

⁴⁵The idea that everyone else should have realigned against the deutschmark is compelling if one believes that German unification, requiring a higher price of German goods, was the principal shock to the system.

⁴⁶For plausible parameter values, the disinflationary effects on Germany and the corresponding German interest rate cut will be greater when there are a large number of small devaluations than a large number of small devaluations.

with a general realignment of ERM currencies but that France refused to go along.⁴⁷ The same formula informed the negotiations between Germany and Italy over the weekend of September 11-12, when Italy agreed to realign within the ERM and German agreed to a modest reduction in interest rates. But the Bath Summit yielded up no positive result, and the Bundesbank was prepared to reduce interest rates by only the narrowest margin in the wake of the Italian move, given that just one country, not seven, had devalued.⁴⁸

That Europe, where monetary cooperation was more highly developed than anywhere else in the world, was unable to respond to this crisis cooperatively is revealing of the obstacles to the collective management of exchange rates under even the most favorable circumstances. Those countries in the best position to reject the pressure to devalue — France for instance — had non-economic reasons to resist going along. The French government had been pursuing a “franc fort” policy intended to establish the franc as an equal partner with the deutschmark; to devalue would have put paid to the notion that France was the co-leader of the EMS and an equal partner in EMU — and would have done so at the worst possible time, only days prior to the French referendum. And if France refused to devalue, so too would other countries, and the prospects for coordinated realignment would disintegrate.

In addition, Ireland, Spain and Portugal (and even the UK as late as the Bath Summit) had their own reasons to avoid devaluing. The currency peg was the repository of their anti-

⁴⁷Major (1999), p.323.

⁴⁸Major (1999), p.327 writes that the Italians encouraged other countries, including the UK, to accompany it in devaluing but that again it was French resistance that prevented them from going along.

inflationary credibility, and to abandon it would be a heavy blow to confidence.⁴⁹ The essence of this problem is the now-familiar inability of countries to develop an “exit strategy” from a peg adopted as part of an exchange rate based stabilization (Eichengreen and Masson et al. 1998).

Moreover, if countries devalued once, what was to prevent the markets from thinking that they would devalue again? And in the new control-free environment, what would prevent currency traders from acting on this expectation? A general realignment, even if formulated cooperatively, threatened to undermine confidence in the ERM. Inevitably, in this environment of high capital mobility, the “adjustable peg” became an oxymoron.

Stephens reports that the Major Government had already locked itself into a no-devaluation strategy in June in response to a paper warning that devaluation within the ERM would deal a terrible blow to confidence. “The conclusion drawn by the Treasury was that if sterling was devalued — unilaterally or alongside other weak currencies like the lira and the peseta — the government would lose this essential credibility. A depreciation of, say, 5 or even 10 per cent within the ERM would lead investors to doubt the government’s commitment to a strong pound and, perversely, to anticipate a further depreciation.”⁵⁰ The implication was that if sterling’s level was to be adjusted, it would be better to abandon the Exchange Rate Mechanism all together and allow the currency to float downward, rather than attempting and possibly failing to hold a new parity within the ERM. This, of course, was the view that ultimately prevailed on “Black Wednesday.” Countries with a choice, even as slim a choice as Britain and Spain, thus

⁴⁹As John Major told Terry Burns in late August, “We have invested a lot in the ERM...If we devalue the first time pressure emerges, our anti-inflation policy will lose all credibility.” Major (1999), p.319.

⁵⁰Stephens (1996), p.210.

refused to go along with proposals for a joint devaluation. And their strong-currency counterparts had no way of forcing them.

In addition, even in Europe, where the institutions of monetary cooperation were singularly well developed, there were practical obstacles to cooperation. It was finance ministers and central bank presidents who assembled at the Bath Summit but the boards of central banks — in some cases, independent central banks — that controlled interest rates. Federal Finance Minister Theo Waigel and Bundesbank President Helmut Schlesinger, while present at Bath, did not have the power to alter German interest rates; this was a decision that could only be taken by the Bundesbank Council (the Board together with the Presidents of the Land Central Banks). Under these circumstances, the pressure placed on Schlesinger by Norman Lamont, who chaired the Bath meeting, was ineffective if not counterproductive.⁵¹

In addition, efforts to arrange a joint realignment over the weekend of September 11-12 were complicated by rules requiring the chairman of the Community's monetary committee to communicate Germany's desire to the other members and to convene the relevant meeting. The committee chairman was the director-general of the French Treasury, Jean-Claude Trichet. Although Trichet was kept informed of German desires (German officials having briefed him just prior to their meeting with the Italians), he did not arrange — nor does it appear that he suggested

⁵¹As Dyson and Featherston (1999, p.683) put it, it broke the cardinal rule of international negotiations, that “no one should be asked to deliver what they do not have the domestic power to commit themselves to.” The British view (Major 1999, Chapter 14; Lamont 1999, Chapter 9) is that in placing pressure on German officials Lamont was simply voicing the preferences and concerns of other European governments. In his 1999-2000 article, the then Chancellor observes that exchange rate policy, as distinct from monetary policy, was a matter for the federal government, not the Bundesbank, although it is not clear that a change in German monetary policy designed to sustain the exchange rate of a particular foreign currency is properly seen as falling under this heading.

— a meeting of the committee.⁵² The suspicion is that the French feared that a meeting would create pressure for the franc to be included in a general realignment, something the government, the referendum looming, wished to avoid.

In sum, incentive institutional problems prevented ERM members from responding to pressures in a coordinated fashion. If Europe could not finesse these difficulties, it is hard to imagine that East Asia or Latin America could do better.

7. The EMS Crisis in Light of its Emerging Market Successors

A standard way of gauging what is distinctive about a crisis is to take early-warning indicators constructed on the basis of previous crises and see whether they predict out of sample. This is the approach used by Bussiere and Mulder (1999), for example, to see whether the models estimated by Sachs, Tornell and Velasco (1996) for the Tequila predict the Asian crisis, and whether the models estimated by Berg and Patillo (1998) and Tornell (1999) for the Tequila and the Asian crisis accurately forecast the financial upheavals of 1998-9.⁵³ In this section I undertake the same exercise in reverse.

In what follows I utilize the preferred model of Bussiere and Mulder, which fits the data for the Tequila and Asian crises and does a reasonably good job of forecasting which countries

⁵²Instead, it is said by Stephens (1996) and Frowen (1999-2000) that Trichet communicated aspects of what he had learned from German officials to other European ministers in bilateral telephone conversations, which substituted for rather than instigating a meeting of the Monetary Committee.

⁵³One need not be a believer in early-warning indicators for these exercises to be useful; for those for whom diversity rather than uniformity is the most impressive feature of the different crises, the forecast errors are useful precisely for highlighting what is different about each event.

got into trouble in 1998-9. Since this model appears to be the best performer terms of ability to summarize the macroeconomic and financial causes the financial crises of 1994-9, it is a logical point of departure for analyzing what, if anything, was different about the European crises of 1992-3.

Bussiere and Mulder derive their index of crisis risk by regressing exchange market pressure (a weighted average of exchange rate changes and reserve changes) on five indicators: the current account as a percent of GDP, export growth, the percentage change in international reserves, the deviation of the real exchange rate from trend, and short-term foreign debt relative to reserves (all lagged one year).⁵⁴ This spare list of variables does a surprisingly good job of predicting which countries experienced exchange market pressure in 1998-9. But does it do as well at predicting Europe's crises in 1992? The first column of Table 4 shows the predicted levels of exchange market pressure for European countries in 1992, using the coefficients estimated by Bussiere and Mulder on data for Latin America and East Asia in 1994-7. Strikingly, Finland, the UK and Sweden, three of the first countries whose currencies were attacked, are at the top of the list. For Finland, the only country in the European sample to experience a Latin-American-style terms-of-trade shock 1990-1, the predicted level of exchange market pressure is similar to that forecast by same the model for Brazil and Argentina in 1998. The levels of pressure predicted for the next countries on the list, the UK and Sweden, are considerably lower, roughly analogous to that experienced by Mexico in 1998. These results suggest considerable similarity between the 1992 crisis in Europe and its emerging market successors.

⁵⁴Real appreciation is calculated as the deviation from trend over the course of the preceding 48 months.

On the other hand, certain countries, notably Italy, rank surprisingly low on the list. The explanation is Italy's low level of short-term external debt, by emerging-market standards. The difference of course is not that Italy, and European countries generally, issued less short-term debt — to the contrary — but that the debt in question was domestic, not international.⁵⁵ When both domestic and international obligations are added into the debt ratio, the same model generates the ranking in the second column of Table 4. Italy, whose debt problem was notorious, moves to the head of the list. Less reassuringly, this version also predicts a high level of exchange market pressure in France, a country that did not suffer a crisis in 1992.⁵⁶

It can be argued that both the level of short-term debt and the percentage change in reserves are better regarded as consequences than causes of crises. Seeing a crisis looming for other reasons, market participants will begin drawing down a country's reserves and shortening the maturity of their credits, generating spurious forecasts that seem to validate subsequent events. This is an argument for dropping short-term debt and reserve losses from the forecasting model. The consequences of doing so are shown in the third column of Table 4.⁵⁷ In some sense, this version generates the most plausible predictions: Finland is again the country whose fundamentals predict the most serious crisis, followed by Spain, Sweden, the UK and Italy, which come very closely clustered together. The only troubling aspects of this ranking are that Italy,

⁵⁵Data from the BIS and World Bank put short-term international debt at 41 per cent of reserves for our European countries in 1992 but at 96 per cent for Bussiere and Mulder's emerging markets in 1997.

⁵⁶Although it did in 1993.

⁵⁷Since the coefficient on reserves in the forecasting model is very small, dropping this variable changes almost nothing; the change in ordering is heavily driven by the elimination of effects related to the presence of short-term debt.

which was identified as a target by currency speculators well in advance of the UK, Sweden and Spain, does not exhibit a higher predicted level of exchange market pressure, and that Ireland and Portugal, two countries that also experienced serious problems in 1992, are not higher on the list.

This suggests the following implications. First, the three current account related variables — export market growth, the evolution of the real exchange rate, and the current account deficit — go a good way toward explaining which countries suffered crises in 1992. Current-account-centered explanations for their crises cannot be dismissed, in other words. Second, however, to understand why the crisis was particularly acute in certain countries — Italy in particular — one must add a role for capital-account-centered problems, which could manifest themselves because of a heavy load of short-term debt. Third, several countries which experienced speculative pressure in 1992 — Portugal and to a lesser extent Ireland — should not obviously have done given their fundamentals, or so this model suggests. Portuguese officials complained of guilt by association with Spain — that investors were unable to tell the escudo and peso apart. Irish officials made similar arguments with respect to the UK. There is some support here for their laments.

8. The Aftermath of the Crisis

How deep was the crisis-induced recession, and how vigorous was the subsequent recovery? As alternative metrics, I consider the crises in emerging markets and European countries pursuing different post-crisis monetary policy operating strategies.

European versus Emerging Markets. Conventional wisdom has it that currency crises are more disruptive in emerging markets, where financial markets are thin, debt is denominated in

foreign currency, and confidence is fragile. Table 5 shows that GDP growth falls by 3 percentage points between the years preceding and following a crisis in the typical emerging market, but not at all in the typical OECD country.⁵⁸ For our six European countries in 1991-2, the comparable figure is 1.6 percentage points. In this respect, our EMS cases look as much like emerging markets as developed countries (they are almost exactly midway between the two).⁵⁹

How do the subsequent recoveries compare? The cumulative percentage increase in output between 1992 and 1995 was 3.3 per cent for our six European countries. [See Table 6.] The comparable figure for Mexico is 10.5 per cent. Thus, while Mexico's recession was deeper, its recovery was faster.⁶⁰ Mexico's experience is not atypical of post-1970 emerging markets. But the 1991-2 EMS cases are atypical of OECD countries, a point to which we return below.

Another perspective is provided by the evolution of demand. Real domestic demand rose less rapidly than real GDP in all six European countries but also in Mexico, while real external demand (real exports minus real imports) rose more quickly in each case. [See Table 7.] Just as

⁵⁸ Calvo and Reinhart (2000), using a different sample, estimate that growth typically falls by 2.0 percentage points between the year preceding a currency crisis and the year following in emerging markets, but by only 0.2 points in developed countries.

⁵⁹ This may not feel right to readers impressed by the Asian crisis, in which the initial output losses were immense (depending on how it is dated, the swing in growth can be as large as 14 per cent -- from plus 7 preceding the crisis to negative 7 following). The comparison with the Table 5 averages underscores how unusual this experience was. The comparisons in Table 5 are for 1991-93 for all countries except Finland, where we compare 1990 with 1992. Note that the apparent mildness of the Mexican crisis reflects its v-shape and the difficulty of dating it. Table 5 takes 1995 as the year of that crisis, although strictly speaking it broke out in December of 1994. If we take 1994 as year *t*, then the drop in the growth rate is a dramatic ten percentage points.

⁶⁰ Of course, Mexico, being an emerging market, should be expected to display a faster rate of growth, other things equal, until its levels of income and productivity converge to those of other OECD members.

in Mexico two years later, in other words, external demand provided much of the stimulus for recovery. In terms of the shift in the current account (as a share of GDP) between the pre- and post-crisis periods, the six Europeans again lie in between the OECD countries and emerging markets. [See Table 8.]

To be sure, the factors underlying this pattern were not the same. In Mexico, the weakness of domestic demand was attributable to private consumption and investment, reflecting the financial fragility of firms and the incapacity of the troubled banking sector. In Italy, Portugal, Sweden and the UK, domestic demand was limited by the slow growth of government consumption as countries sought to eliminate budget deficits and meet the Maastricht convergence criteria for monetary union. [Again, see Table 7.] As Gordon (1999) emphasizes, this contractionary fiscal impulse is part of the explanation for why growth in the European crisis countries was relatively sluggish in the immediate post-crisis years, as shown in Table 6 above.

Every crisis is different, as emphasized at the beginning of Section 1. What is striking about Europe's in from this perspective is that the macroeconomic consequences resemble those in the typical emerging market as much as they do other developed-country cases. One can imagine several explanations. First, the EMS crises were the first postwar industrial-country events of their kind to take place in an environment of fully free capital mobility, increasing the scope for reserve losses and financial dislocations. Second, Europe's crises were clustered in time to a greater extent than was typical of the industrial countries prior to 1992. This too is plausibly a function of the integration of capital markets insofar as contagion is greater in a world of high capital mobility. This meant that no one country could export its way out of its difficulties by selling products into other EU member states that also succumbed the crisis, magnifying the

output effects. And, third, banking and financial systems were hit to an extent unusual for developed-country crises. Banking systems were already in a delicate state when the crisis struck. Again, this is plausibly a function, in part, of financial deregulation and capital account liberalization in the preceding period, a combination which allowed European banks to fund themselves externally and lever up their bets.

Peggers versus Targeters. Our six European countries pursued several different post-crisis monetary strategies. Portugal and Spain remained in the Exchange Rate Mechanism at substantially lower parities. Finland and Italy floated before eventually reentering the ERM in October and November of 1996. (Finland didn't "reenter," to be precise, but substituted ERM membership for its earlier Ecu peg.⁶¹) Sweden and the UK continued to float.

Viewed analytically, these alternatives were really only two: floating and hard currency pegs. The middle ground of shadowing the deutschmark in the manner of pre-1992 Sweden and Finland was no longer attractive or, it would appear, viable.⁶² By the time Italy and Finland (re)joined the ERM, the participating countries had affirmed their intention of completing the transition to monetary union in short order -- precisely because the crisis had shown that even collective pegs could be unstable. With EMU looming closer, Italy and Finland, for whom

⁶¹ Following its accession to the European Union.

⁶² To be sure, ERM members differed in the degree to which they utilized the exchange rate flexibility permitted by their plus-or-minus 15 per cent bands. For example, whereas the Netherlands continued to hold the guilder very stable against the DM, Ireland utilized all the flexibility that the newly-widened bands permitted. Spain adopted an explicit monetary policy operating strategy — inflation targeting — to stabilize expectations and the fluctuation of the exchange rate within the newly widened bands. (I will have more to say about inflation targeting below.) While such qualifications are important, they do not undermine the general point that countries moved away from narrow bands and unilateral pegs in the wake of the 1992-3 crisis.

participation in the monetary union was of particular value, became still more committed to defense of their currency pegs than before.⁶³ And as public debt ratios and unemployment rates began to decline, reflecting countries' efforts to satisfy the convergence criteria (and the fortuitous fact of Europe's recovery from its 1992-3 recession), their capacity to defend their pegs was enhanced. With the inauguration of monetary union on January 4th, 1999, this process of hardening exchange rate pegs was complete. The first two years of the euro have not been without their blemishes, but one thing monetary union has done is to banish from Europe the problem of currency crises that bedeviled the continent in the early 1990s.

The UK and Sweden, meanwhile, have continued to float. Their relatively happy experiences can be attributed to the speed with which they substituted an alternative monetary policy operating strategy for the exchange rate target. Both embraced inflation targeting as a way of anchoring expectations and communicating to the markets the intentions of the monetary authorities. In Britain's case, the Chancellor of the Exchequer announced an inflation target of one to four per cent three weeks after Black Wednesday.⁶⁴ Three weeks after that the Chancellor and the central bank worked out the details of their new monetary policy operating strategy. The Bank of England began publishing a quarterly *Inflation Report* containing its inflation forecast, the new yardstick of the policy. While the Chancellor still controlled the instruments of monetary policy (the Bank of England not being independent), he committed to doing so in a manner

⁶³These two cases were very different. While Italy attached exceptional value to being accepted for EMU due to its incomplete monetary credibility and correspondingly high interest rates, for Finland EMU was attractive because of its proximity to Russia and consequent desire to build a firmer bridge to the European Union.

⁶⁴A lengthier description of the UK's adoption of inflation targeting is Mishkin and Posen (1997).

consistent with the new inflation-targeting regime and the Bank's forecasts. The Bank, for its part, took it upon itself to evaluate the conduct of monetary policy, not just in meetings with Treasury officials but publicly.

Thus, barely six weeks after the crisis, the UK had in place the rudiments of an inflation-targeting regime.⁶⁵ The authorities selected the retail price index net of mortgage payments as the measure of inflation, and the Office of National Statistics was made responsible for calculating the series. After early experience made clear that the authorities were capable of controlling the inflation rate quite closely, the target range was replaced by a single target of 2.5 per cent but with thresholds on either side. The practice of monthly meetings between the Chancellor of the Exchequer and the Governor of the Bank of England was formalized. Beginning in 1994, the minutes of these monthly meetings were released two weeks after the next meeting.⁶⁶ The final step was the Labour Government's decision in 1997 to grant operational independence to the Bank of England and the creation of a Monetary Policy Committee responsible for policy decisions. In the event the target was missed, the Bank was required to explain why, what policy actions would be taken to correct the discrepancy, and when inflation was expected to return to target.

⁶⁵Departing from some models of inflation targeting, the authorities did not specify an explicit model of how monetary policy affects the economy. A more important departure from the standard model was that the Bank of England was not independent. The Chancellor effectively made interest-rate decisions, although in the context of institutionalized consultation with the Bank. As Mishkin and Posen put it, the Bank became the Chancellor's "institutional counterinflationary conscience."

⁶⁶The Chancellor did not have to provide detailed explanations, however, for his reasons for going against the Bank's recommendations, either through these minutes or independent channels, which was a limitation of the pre-1997 British system.

Sweden's adoption of inflation targeting was almost as quick, coming just two months after the floating of the krona.⁶⁷ The new regime was announced following consultations between Riksbank staff and outside experts. However, the requirement for the Riksbank to orient policy toward its new target was deferred to the beginning of 1995, reflecting the desire to avoid an overly stringent monetary policy while the effects of the krona's depreciation fed through to domestic prices and unemployment remained high. The hope was that even a deferred commitment would stabilize expectations, despite the fact that no guidelines were articulated for the conduct of monetary policy in the interim.

The government retained legal control of the Riksbank, making its Governing Board effectively an extension of the parliament, although the Board set both the inflation target and monetary policy instruments in practice, avoiding the problems of divided accountability that characterized British inflation targeting. The central bank targets a two per cent interval for inflation centered on 2 per cent. It publishes an *Inflation Report* quarterly, in which it relates its policies to the inflation target.⁶⁸ It targets headline rather than core inflation, this being the measure relevant to unions and employers associations. The tolerance interval around the inflation target of 2 per cent is narrower than the British at plus or minus one per cent. Bernanke et al. (1999) interpret this in terms of greater concern for the credibility of the inflation target, reflecting the delay in implementation and persistent political battles over the conduct of monetary

⁶⁷Good sources on its experience are Svensson (1995) and Bernanke, Laubach, Mishkin and Posen (1999).

⁶⁸Initially, the report was published three times annually. At first, it did not publish its own inflation forecast, although in late 1997 it began doing so in graphical form.

policy.⁶⁹

It can be argued that the UK and Sweden were in a relatively favorable position to adopt inflation targeting. In both cases, adoption of the new policy followed a period successful disinflation, which made it relatively easy to hit the new target. Because unemployment was rising in both countries, wage pressure was subdued. Both countries had long-established central banks with accurate models of inflation, and the advanced development of their financial markets implied stable links between the instruments of monetary policy and the level of prices. Neither had debts or deficits on a scale that threatened to undermine the credibility of monetary policy. Thus, what was possible for the UK and Sweden may be more difficult to achieve in other countries.

Moreover, neither the UK nor Sweden provides a totally clean experiment with inflation targeting. The fact that the two countries were still in recession when the new regime was adopted complicates interpretation of their experiences. Their central banks were not independent. In Britain, the Exchequer set the instruments of monetary policy until May 1997 (as noted above), while the Bank of England provided the inflation forecasts and used public statements to apply anti-inflationary discipline to the Chancellor. In Sweden, the independence of the central bank similarly remained limited for most of the 1990s. Four of the seven members of Governing Board of the Riksbank, who were responsible for operational matters in monetary

⁶⁹The opposition Social Democrats have consistently advocated more aggressive monetary expansion than the governing Liberal-Conservative coalition. Thus, when the Social Democrats formed a minority government following the September 1994 election, they appointed a new central bank board predisposed toward their agenda, something which did not enhance the credibility of Swedish inflation targeting.

policy, were appointed by the governing party or parties, the other three by the opposition.⁷⁰ The Governor was chosen by the Board for a five-year term.⁷¹ Finally, at the beginning of 1999 a new Riksbank Act (adopted in November 1998) mandated three important changes in these procedures. First, policy instruments were no longer formally determined by the Governing Board appointed by the Parliament. The Governing Board instead appointed six members of an Executive Board (one of whom is chairman and Governor of the Riksbank) with wide responsibility for policy.⁷² Second, the goal of price stability was written into the Riksbank Act (although the law also stated that the central bank shall “promote a safe and efficient payments system”). And third, the requirement of a written report on monetary policy to the Parliamentary Standing Committee on Finance, at least twice a year, was written into the law.⁷³

For what it is worth, the comparison with Finland and Italy (where, helpfully for the analysis, recession and unemployment were of roughly comparable magnitude) is shown in Figure 3 (for interest rates) and Figure 4 (for inflation). Interest rates did not decline immediately, as has been noted by previous researchers (by e.g. Laubach and Posen 1997). There is, however, some evidence in Figure 3 that interest rates fell more quickly in the two inflation targeters.

What about the speed of recovery? The cumulative percentage increase in real GDP between 1992 and 1995 was 8.4 per cent for the two inflation targeters (Sweden and the UK), 8.0

⁷⁰They serve for the duration of the Parliament (of which most appointees are in practice members).

⁷¹Although the Board could dismiss him at any time.

⁷²The six members have staggered contracts, with one new appointment being made per year

⁷³See Berg (2000).

for the two ERM “re-entrants” (Italy and Finland), and 6.0 per cent for the two exchange rate targeters (Spain and Portugal) when we take simple arithmetic averages. While this conclusion will hearten the proponents of inflation targeting, it is important to bear in mind the small sample from which it is derived.

In sum, the evidence from Europe does not obviously favor inflation targeting over a hard currency peg. It suggests that both are viable monetary strategies. In addition, it is consistent with the notion that intermediate arrangements — soft pegs and managed floats not backed by a credible, transparent alternative monetary policy operating strategy — are not viable in a world of high capital mobility. As a result of its crisis, Europe moved from a hybrid exchange-rate-cum-monetary regime to hard pegs (leading ultimately to monetary unification) and relatively free floating backed by inflation targeting. Its experience supports the presumption that this is the direction in which other regions, like Latin America, are also heading.

8. Conclusion

It was Michele Camdessus who dubbed the Mexican crisis “the first financial crisis of the 21st century.”⁷⁴ If by this is meant a crisis occurring in an environment of financial deregulation and capital account liberalization, in which both capital movements and domestic financial fragility are implicated, then the EMS crisis can claim precedence. The 1992 crisis was different from the typical industrial-country crisis that preceded it. It was more virulent. It was more contagious. It was more disruptive to output. Both capital flows and financial fragility played more prominent roles. In these senses it was a harbinger of the Tequila and the Asian flu.

But however impressive the 1992 crisis by the standards of industrial countries, the

⁷⁴Camdessus (1995).

associated output losses and financial distress were more limited than in Mexico in 1995 or Korea in 1998. There may be parallels between the EMS crisis and its emerging-market successors, in other words, but these should not be pushed too far.

Two lessons follow. First, with financial deregulation and capital account liberalization, the crisis problem has grown more severe. Crises can erupt less predictably, and their effects can be more virulent. Second, to defend themselves, emerging economies need to develop the liquid capital markets, reputations for following sound and stable policies, and capacity to regulate their financial markets and institutions that distinguish their developed-country counterparts. Progress in financial deepening and development will enable them to rationalize their exchange rate systems -- to float independently of their larger neighbors, or to peg their currencies once and for all -- thereby further reducing crisis incidence. At that point they will be able to confidently assert that the benefits of financial liberalization exceed the costs.

References

- Bank for International Settlements (1993), *63rd Annual Report*, Basle: BIS.
- Bayoumi, Tamim and Barry Eichengreen (1994), "Macroeconomic Adjustment Under Bretton Woods and the Post-Bretton Woods Float: An Impulse-Response Analysis," *Economic Journal* 104, pp.813-827.
- Begg, David et al. (1990), *Monitoring European Integration: The Impact of Eastern Europe*, London: Centre for Economic Policy Research.
- Berg, Andrew and Catherine Patillo (1998), "Are Currency Crises Predictable? A Test," IMF Working Paper WP/98/154.
- Berg, Claes (2000), "Inflation Forecast Targeting : The Swedish Experience," Sveriges Riksbank Working Paper no. 100 (February).
- Bernanke, Ben, Thomas Laubach, Frederic Mishkin and Adam Posen (1999), *Inflation Targeting: Lessons from the International Experience*, Princeton: Princeton University Press.
- Borensztein, Eduardo, Andy Berg, Gian-Maria Milesi-Feretti and Catherine Patillo (1998), "Anticipating Balance of Payments Crises: The Role of Early Warning Systems," IMF Occasional Paper (forthcoming).
- Branson, William (1994), "German Unification, the Breakdown of the EMS, and the Transition to Stage III," in David Cobham (ed.), *European Monetary Upheavals*, Manchester: Manchester University Press, pp.16-31.
- Buiter, Willem, Giancarlo Corsetti and Paolo Pesenti (1998), *Financial Markets and European Monetary Cooperation: The Lessons of the 1992-93 Exchange Rate Mechanism Crisis*, Cambridge: Cambridge University Press.
- Bussiere, Matthieu and Christian Mulder (1999), "External Vulnerability in Emerging Market Economies: How High Liquidity Can Offset Weak Fundamentals and the Effects of Contagion," IMF Working Paper WP/99/98.
- Calvo, Guillermo and Carmen Reinhart (2000), "Fixing for Your Life," *Brookings Trade Policy Forum 2000* (forthcoming).
- Camdessus, Michele (1995), "Drawing Lessons from the Mexican Crisis: Preventing and Resolving Financial Crises — The Role of the IMF," Address at the 25th Washington Conference of the Council of the Americas, Washington, D.C., 22 May.
- Campa, Jose and Kevin P.H. Chang (1996), "Arbitrage-Based Tests of Target Zone Credibility: Evidence from ERM Cross-Rate Options," *American Economic Review* 86, pp.726-740.

Clarida, Richard, Jordi Gali, and Mark Gertler (1997), "Monetary Policy Rules in Practice: Some International Evidence," NBER Working Paper no. 6254 (November).

Clarida, Richard and Mark Gertler (1997), "How the Bundesbank Conducts Monetary Policy," in Christina Romer and David Romer (eds), *Reducing Inflation*, Chicago: University of Chicago Press, pp. 363-412.

Connolly, Bernard (1995), *The Rotten Heart of Europe: The Dirty War for Europe's Money*, London: Faber and Faber.

Dyson, Kenneth and Kevin Featherstone (1999), *The Road to Maastricht*, Oxford: Clarendon Press.

Eichengreen, Barry and Olivier Jeanne (2000), "Currency Crisis and Unemployment: Sterling in 1931," in Paul Krugman (ed.), *Currency Crises*, Chicago: University of Chicago Press.

Eichengreen, Barry and Paul Masson et al. (1998), "Exit Strategies: Policy Options for Countries Seeking Greater Exchange Rate Flexibility," *IMF Occasional Paper* 168 (June).

Eichengreen, Barry and Charles Wyplosz (1993), "The Unstable EMS," *Brookings Papers on Economic Activity* 1, pp.51-144.

Eichengreen, Barry, Andrew Rose and Charles Wyplosz (1995), "Exchange Market Mayhem: The Antecedents and Aftermath of Speculative Attacks," *Economic Policy* 21, pp.249-312.

Flood, Robert and Peter Garber (1984), "Gold Monetization and Gold Discipline," *Journal of Political Economy* 92, pp.90-107.

Frankel, Jeffrey (1986), "The Implications of Mean-Variance Optimization for Four Questions in International Macroeconomics," *Journal of International Money and Finance* 5, pp.S53-75.

Frowen, Stephen (1999-2000), "Unjustified British Critique of the Bundesbank," *Central Banking X*, pp.40-45.

Giavazzi, Francesco and Alberto Giovannini (1989), *Limiting Exchange Rate Flexibility: The European Monetary System*, Cambridge: MIT Press.

Gordon, Robert (1999), "The Aftermath of the 1992 ERM Breakup: Was There a Macroeconomic Free Lunch?" NBER Working Paper no. 6964 (February).

International Monetary Fund (1992), *World Economic Outlook*, Washington, D.C.: IMF (October).

International Monetary Fund (1993), *International Capital Markets, Part I. Exchange Rate Management and International Capital Flows*, Washington, D.C.: IMF.

- Jeanne, Olivier (1997), "Are Currency Crises Self-Fulfilling? A Test," *Journal of International Economics* 42, pp.263-286.
- Krugman, Paul (1979), "A Model of Balance of Payments Crises," *Journal of Money, Credit and Banking* 11, pp.311-325.
- Lamont, Norman (1999), *In Office*, London: Little, Brown & Co.
- Lamont, Norman (1999-2000), "Black Wednesday — the Controversy Continues," *Central Banking X*, pp.65-69.
- Laubach, Thomas and Adam Posen (1997), "Some Comparative Evidence on the Effectiveness of Inflation Targeting," Federal Reserve Bank of New York Research Paper no. 9714 (May).
- Major, John (1999), *John Major, the Autobiography*, London: Harper Collins.
- Meuhring, Keith (1992), "Currency Chaos: The Inside Story," *Institutional investor* (October), pp.11-15.
- Mishkin, Federic and Adam Posen (1997), "Inflation Targeting: Lessons from Four Countries," NBER Working Paper no. 6126 (August).
- Obstfeld, Maurice (1986), "Rational and Self-Fulfilling Balance of Payments Crises," *American Economic Review* 76, pp.72-81.
- OECD (1997), *OECD Economic Surveys: Sweden 1996-1997*, Paris: OECD.
- Ozkan, F. Gulcin and Alan Sutherland (1994), "A Model of the ERM Crisis," CEPR Discussion paper no. 879 (January).
- Rose, Andrew and Lars Svensson (1994), "European Exchange Rate Credibility Before the Fall," *European Economic Review* 38, pp.1185-1216.
- Sachs, Jeffrey, Aaron Tornell and Andrews Velasco (1996), "Financial Crises in Emerging Markets: The Lessons from 1995," *Brookings Papers on Economic Activity* 1, pp.147-215.
- Stephens, Philip (1996), *Politics and the Pound: The Conservatives' Struggle with Sterling*, London: Macmillan.
- Svensson, Lars (1995), "The Swedish Experience of an Inflation Target," NBER Working Paper no.4985 (January).
- Tornell, Aaron (1998), "Common Fundamentals in the Tequila and Asian Crises," unpublished manuscript, Harvard University.

Willman, Alpo (1988), "The Collapse of the Fixed Exchange Rate Regime with Sticky Wages and Imperfect Substitutability Between Domestic and Foreign Bonds," *European Economic Review*, pp.1817-1839.

Table 1. Performance of ERM Members Relative to the Deficit and Debt Criteria

	DEFICIT/GDP (%)					DEBT/GDP (%)				
	1991	1992	1993	1994	1995	1991	1992	1993	1994	1995
Austria	2.4	2.0	4.1	4.4	5.5	56.6	56.1	63.0	65.2	68.0
Belgium	6.5	6.6	6.6	5.3	4.3	132.6	134.4	141.3	140.1	138.3
Denmark	2.1	2.9	4.5	3.9	2.1	60.9	63.1	66.8	68.7	68.8
Germany	3.3	2.9	3.3	2.5	2.3	42.7	47.3	51.8	54.6	62.5
Finland	1.5	5.8	7.9	5.5	5.0	23.2	42.7	56.2	62.7	69.1
France	2.2	4.0	6.1	6.0	5.0	41.1	45.6	52.9	56.8	59.5
Greece	11.5	12.3	13.2	12.5	11.4	81.7	88.6	117.1	119.8	120.2
Ireland	2.1	2.2	2.3	2.2	2.5	95.3	90.7	92.7	87.9	83.3
Italy	10.2	9.5	9.6	9.0	7.8	103.9	111.4	120.2	122.6	122.1
Luxembourg	1.0	2.5	2.1	2.3	1.4	6.0	7.0	7.0	7.0	8.0
Netherlands	2.8	3.8	3.2	3.0	3.3	76.4	77.1	78.5	79.0	79.4
Portugal	6.5	3.3	7.1	5.7	5.4	62.2	63.2	67.8	70.4	70.8
Spain	4.9	4.2	7.5	6.6	6.2	49.9	53.0	59.4	63.5	66.5
Sweden	1.1	7.5	13.4	10.4	9.2	53.7	69.8	74.6	79.4	84.5
United Kingdom	2.6	6.1	7.9	6.5	4.2	35.5	41.4	47.4	51.6	53.4

Source: Buiter, Corsetti and Pesenti (1998).

Table 2. Indicators of Cumulative Competitiveness Changes^(a)
(in per cent)

Country	Relative to other EC countries ^(b)		Relative to industrial countries		Relative to other EC countries ^(b)		Relative to industrial countries	
	Producer Prices	Unit Labour Costs ^(c)	Producer Prices	Unit Labour Costs ^(c)	Producer Prices	Unit Labour Costs ^(c)	Producer Prices	Unit Labour Costs ^(c)
	1987 - August 1992				1987-December 1992 ^(e)			
Belgium	4.0	5.6	1.3	2.7	0.9	1.9	-0.3	0.3
Denmark	3.6	6.4	-0.5	3.8	-1.9	4.1	-4.9	1.9
Germany (western)	1.7	0.5	-3.8	-5.5	-4.3	-6.6	-5.5	-8.6
Greece	n.a.	n.a.	-10.2	-15.6	n.a.	n.a.	-10.8	-13.4
France	7.9	13.3	3.3	7.2	3.1	8.1	1.7	5.1
Ireland	6.4	35.7	1.3	27.9	-0.6	26.6	-1.9	23.6
Italy	-3.0	-7.0	-6.4	-9.8	11.1	5.7	8.2	4.6
Netherlands	1.5	5.2	-1.4	1.9	-2.6	2.1	-3.9	0.1
	From ERM entry ^(d) - August 1992				From ERM entry ^(d) - December 1992 ^(e)			
Spain	-2.1	-7.5	-8.1	-13.8	4.2	-2.2	0.5	-6.2
Portugal	n.a.	-4.6	n.a.	-6.9	n.a.	-9.5	n.a.	-9.5
United Kingdom	-1.7	-0.4	-4.0	-1.7	8.3	13.2	8.7	13.2

Source: BIS, except for the Spanish and Italian data, which were provided by the respective central banks.

(a) Negative numbers indicate losses. (b) Excluding Greece. (c) Manufacturing sector. (d) Spain: June 1989; Portugal: April 1992; United Kingdom: October 1999. (e) Estimates.

Table 3. Unemployment Rates^(a)

Country	Percentage of Civilian Labor Force			
	1987-89 average	1990	1991	1992 ^(b)
Belgium	10.0	7.6	7.5	8.2
Denmark	6.6	8.1	8.9	9.5
Germany (western) ^(c)	6.1	4.8	4.2	4.5
Greece	7.5	7.0	7.7	7.7
Spain	19.1	16.3	16.3	18.4
France	9.9	9.0	9.5	10.0
Ireland	17.0	14.5	16.2	17.8
Italy	10.9	10.0	10.0	10.1
Luxembourg	2.1	1.7	1.6	1.9
Netherlands	9.2	7.5	7.0	6.7
Portugal	5.9	4.6	4.1	4.8
United Kingdom	8.7	7.0	9.1	10.8
EEC:				
Average	9.7	8.3	8.7	9.5
Dispersion ^(d)	2.7	2.6	3.3	3.7
ERM Original Narrow Band:				
Average	8.1	7.2	7.1	7.4
Dispersion ^(d)	2.2	2.2	2.8	2.9
United States ^(e)	5.7	5.5	6.7	7.3
Japan ^(e)	2.5	2.1	2.1	2.2

Source: Eurostat.

(a) Standardised definition. (b) Estimates. (c) For 1992, unemployment rates (national definition) 14.3% for eastern Germany and 7.7% for the whole of Germany. (d) Weighted standard deviation. (e) Percentage of total labour force.

Table 4. Predicted Levels of Exchange Market Pressure,
European Countries, 1992

Five Variable Index	Five Variable Index, Total Debt	Three Variable Index
29.12 Finland	Italy	Finland
9.34 United Kingdom	France	Spain
6.21 Sweden	Finland	Sweden
0.29 Denmark	United Kingdom	United Kingdom
-1.01 Netherlands	Belgium	Italy
-5.39 Austria	Sweden	Austria
-5.61 Ireland	Spain	Germany
-6.03 France	Denmark	France
-9.15 Spain	Germany	Ireland
-10.49 Italy	Ireland	Netherlands
-13.90 Norway	Netherlands	Norway
-14.87 Germany	Austria	Denmark
-17.87 Belgium	Norway	Belgium
-21.36 Portugal	Portugal	Portugal

Source: see text.

Table 5. GDP Growth Before and After Currency Crises, 1970-98

Country Group	T-1	T (Crisis Year)	T+1	Change from T-1 to T+1
LDC Crises except Mexico 1995 Crisis	3.95	2.06	0.61	-3.34
Mexico 1995 Crisis	4.41	-6.17	5.15	0.74
OECD Crises except EMS 1991-2 Crises	3.16	2.91	3.16	0.00
EMS 1991-2 Crises	0.44	-0.88	-1.19	-1.63

Source: World Bank, author's calculations.

Note: Values are country-group averages (except for Mexico 1995, which shows actual value). First row includes 45 emerging market crises (excluding Mexico 1995). Third row includes 22 industrial-country crises (other than the 1991-2 EMS crises). Fourth row includes the following crises: Finland 1991, Italy 1992, Portugal 1992, Spain 1992, Sweden 1992, and UK 1992.

Table 6. Cumulative Percentage Increase in GDP over 3 Years Following Currency Crises, 1970-98

Country Group	T (Crisis Year)	T+1	T+2	T+3	Sum from T to T+3
LDC Crises except Mexico 1995 Crisis	2.06	0.61	3.14	4.38	10.19
Mexico 1995 Crisis	-6.17	5.15	6.76	4.80	10.54
OECD Crises except EMS 1991-2 Crises	2.91	3.16	3.44	2.08	11.59
EMS 1991-2 Crises	-0.88	-1.19	2.19	3.29	3.41

Source: World Bank, author's calculations.

Note: Values are country-group averages (except for Mexico 1995, which shows actual values). First row includes 38 emerging market crises (other than Mexico 1995). Third row includes 22 industrial-country crises (other than the 1991-2 EMS crises). Fourth row includes the following crises: Finland 1991, Italy 1992, Portugal 1992, Spain 1992, Sweden 1992, and UK 1992.

Table 7. Growth of Real Domestic Demand and its Components Following Crises
(percentage changes)

	Year Immediately Following Crisis	t+1	t+2	t+3	t+4
Total Domestic Demand					
Italy	-5.5	1.9	1.7	2.9	3.7
UK	2.1	3.3	1.9	2.5	2.8
Finland	-6.4	-6.4	2.9	5.8	5.0
Sweden	-5.6	1.4	1.7	1.7	1.5
Portugal	-0.9	1.2	3.2	3.4	3.6
Spain	-4.2	1.1	3.2	2.4	3.0
Mexico	-13.9	6.5	8.3	6.4	5.9
Net External Demand					
Italy	4.6	0.3	1.5	-0.1	-0.5
UK	0.1	0.4	0.7	-0.1	-0.1
Finland	2.1	4.3	0.8	-0.5	-0.7
Sweden	2.9	0.9	1.9	0.9	0.6
Portugal	-0.1	-0.5	-1.3	-1.0	-1.5
Spain	3.3	1.0	-0.4	-0.2	-0.5
Mexico	8.5	-1.2	-1.4	-0.9	-0.9
Private Consumption					
Italy	-2.5	1.6	1.2	2.2	2.5
UK	2.6	3.0	2.0	2.3	2.6
Finland	-4.9	-3.9	2.0	5.1	4.8
Sweden	-3.7	0.5	0.5	0.9	1.7
Portugal	0.4	0.2	1.2	1.9	2.4
Spain	-2.2	0.8	1.8	2.3	3.0
Mexico	-9.5	2.3	5.0	4.4	4.3

Capital Formation					
Italy	-13.1	-0.1	5.6	7.5	7.2
UK	0.6	3.7	2.2	4.8	4.7
Finland	-16.9	-18.6	2.8	14.7	13.9
Sweden	-17.6	-0.4	12.4	9.0	4.5
Portugal	-4.8	3.5	7.5	8.0	7.5
Spain	-10.6	1.4	8.4	6.1	5.3
Mexico	-29.0	17.7	19.2	15.4	13.3
Government Consumption					
Italy	0.7	0.0	-0.4	0.3	0.3
UK	0.3	2.0	0.7	1.4	1.4
Finland	-2.2	-5.3	-0.4	-1.0	-1.5
Sweden	-0.6	-1.0	-1.1	-0.7	-1.1
Portugal	0.6	1.4	2.0	1.5	1.3
Spain	2.3	-0.3	0.9	-0.9	0.0
Mexico	-1.3	3.7	4.2	3.2	3.1

Source: OECD Economic Outlook (various issues).

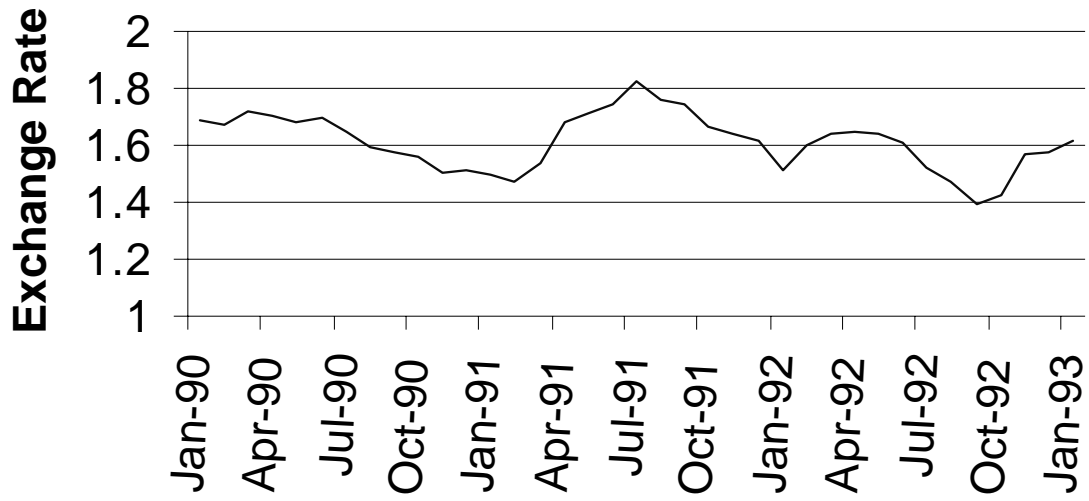
Table 8. Current Account Adjustment Before and After Currency Crises, 1970-98

Country Group	T-1	T (Crisis Year)	T+1	Change from T-1 to T+1
LDC Crises except Mexico 1995 Crisis	-5.26	-3.90	-1.17	4.09
Mexico 1995 Crisis	-7.05	-0.55	-0.70	6.35
OECD Crises except EMS 1991-2 Crisis	-1.33	-1.66	-1.70	-0.37
EMS 1991-2 Crises	-2.56	-2.87	-1.48	1.08

Source: World Bank, author's calculations.

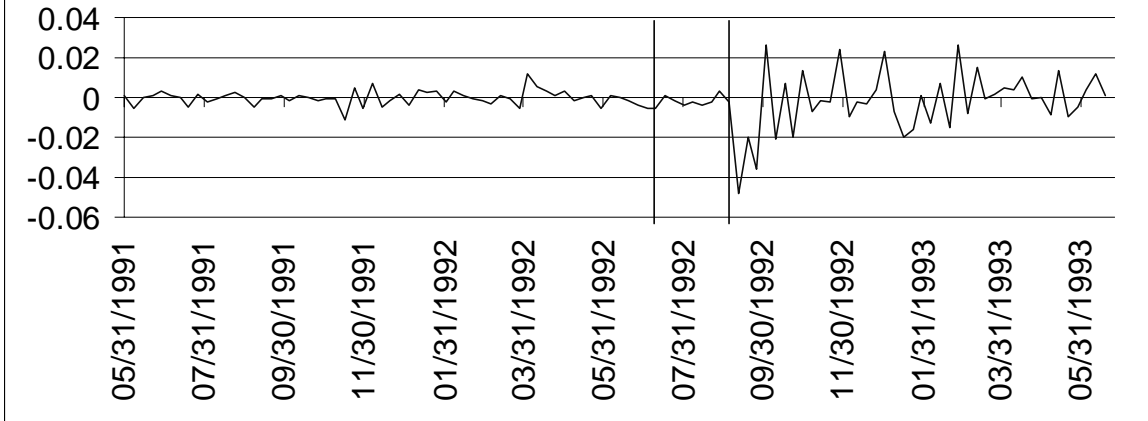
Note: Values are country-group averages (except for Mexico 1995, which shows actual value). First row includes 36 emerging market crises (other than Mexico 1995). Third row includes 17 industrial-country crises (other than the 1991-2 EMS crises). Fourth row includes the following crises: Finland 1991, Italy 1992, Portugal 1992, Spain 1992, Sweden 1992, and UK 1992.

Figure 1. Deutschmark-Dollar Exchange Rate

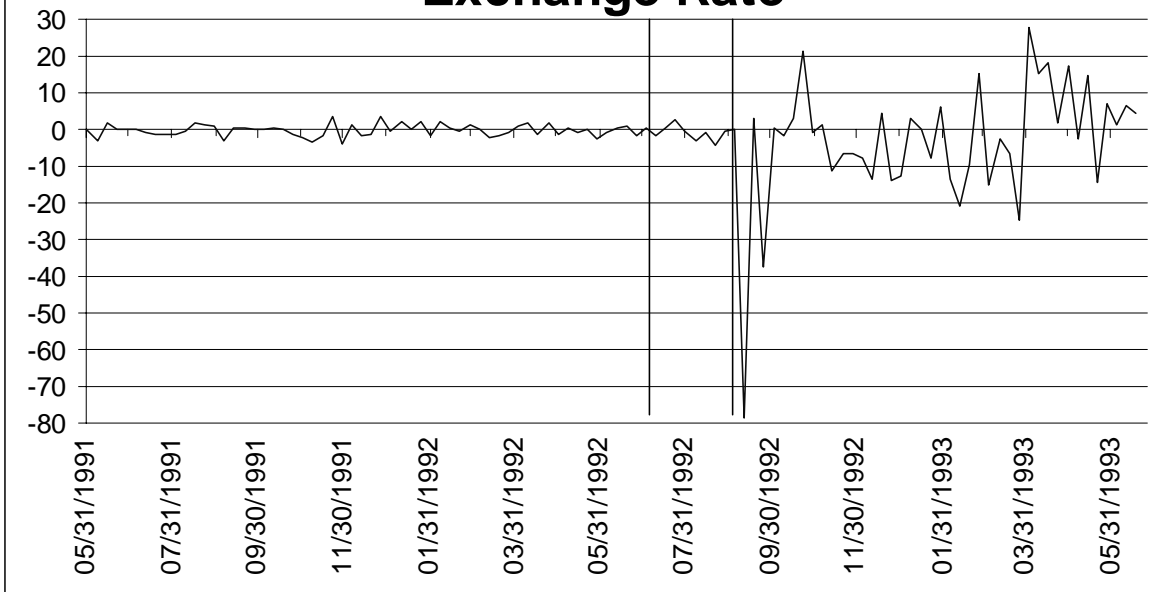


Source: Datastream.

**Figure 2.
Volatility of the Deutschmark-Sterling
Exchange Rate**

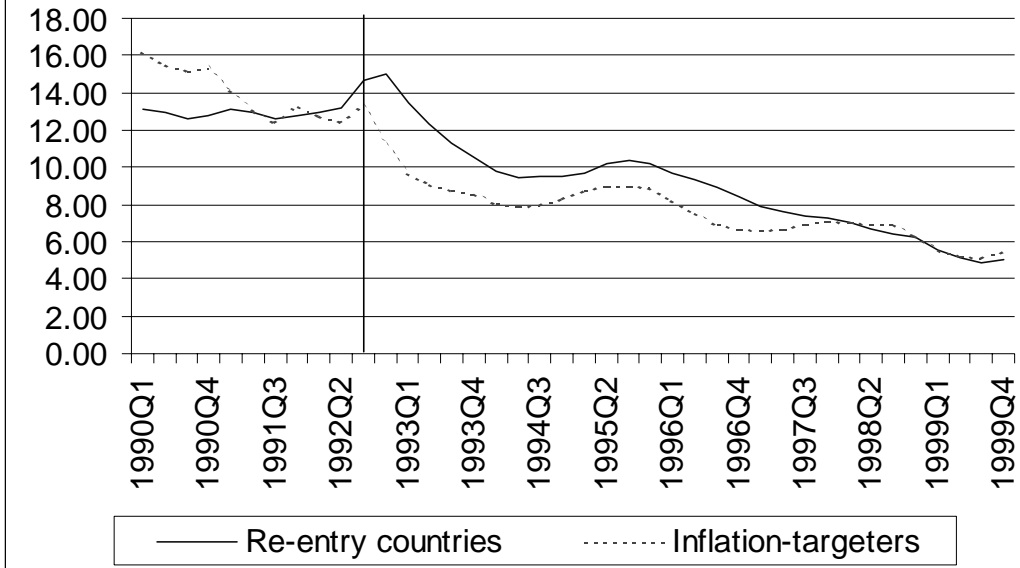


**Volatility of the Deutschmark-Lira
Exchange Rate**



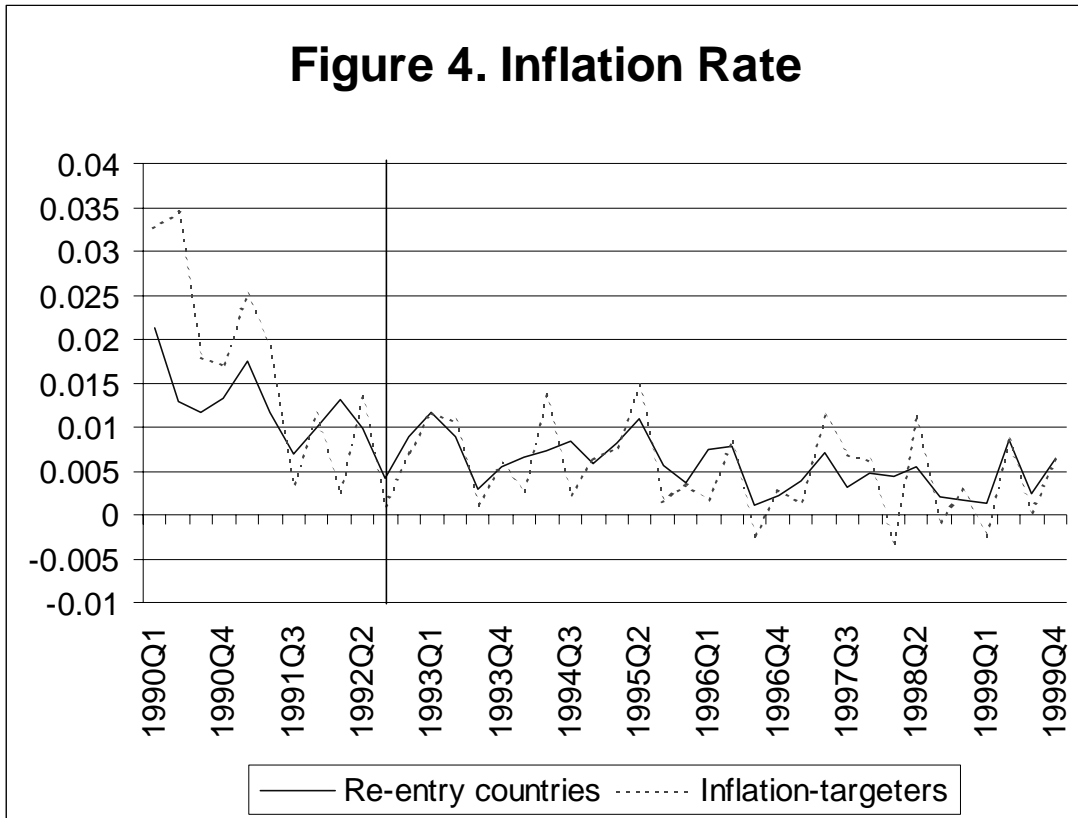
Note: The first vertical line denotes the Danish referendum in June 1992, the second Black Wednesday in September.
Source: Datastream.

Figure 3. Interest Rates in Re-Entry and Inflation Targeting Countries



Source: IFS.

Figure 4. Inflation Rate



Source: IFS.