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Abstract

In contrast to the popular bipolar view on exchange rate choices, this paper argues that intermediate regimes in general and regional exchange rate systems such as the European Monetary System (EMS) in particular should not be ruled out per se when discussing monetary options for East Asian countries. The paper recalls that the 1992/93 crisis of the EMS' Exchange Rate Mechanism had been the crisis of an exchange rate *system* and not just the collapse of unilateral pegs pursued by individual countries. The paper discusses distinct features that add to the credibility of regional exchange rate systems and reasons that a system that is built around well-defined rules and which is being managed very carefully and cooperatively according to those rules could be both credible and sustainable even in the 21st century. The East Asian countries, however, do not fulfill these requirements at this point in time. The paper hence recommends a gradual approach to monetary integration in East Asia, including a coordinated move toward currency baskets, the composition of which could be harmonized over time.

Keywords: exchange rate regimes, regional monetary systems, EMS crisis, policy credibility, monetary integration in East Asia

JEL Classification: F33, F36, F41, F42

1. Introduction*

One of the lessons that are often drawn from the financial crises of the last decade is that exchange rate pegs should no longer be considered as a sensible option in today's world of highly liberalized and technically sophisticated financial markets. Proponents of the bipolar view argue that "unilateral exchange pegs almost invariably go up in flames at some point" (Rogoff 1998, p. 169), and recommend that countries should leave the middle ground and instead of following intermediate regimes, choose between either a rigid fix, i.e. full dollarization or a currency board, or free floating. With the same line of reasoning, regional exchange rate systems are deemed unsuccessful.

And yet a fear of floating (Calvo and Reinhart 2002) has led many countries, including those who severely suffered from currency crises, to maintain pegs toward the dollar or the euro or some form of currency basket. Even more, in some regions – particularly East Asia – proposals for a common basket peg (e.g., Williamson 1999, 2006) or other forms of regional monetary systems (e.g., Hefeker and Nabor 2005) to mimic Europe on its way to monetary unification are considered.[1]

The aim of this paper is to look once more at the causes of the 1992/93 Exchange Rate Mechanism (ERM) crisis in the European Monetary System (EMS) and to identify features that contributed to the functioning and eventual collapse of the ERM respectively. In particular, the paper seeks to analyze the credibility of the system and tries to delineate requirements for successful regional exchange rate regimes in order to examine whether the East Asian countries meet these demands.

The remainder of the paper is structured as follows. The next section dissects the problem of credibility that is inherent to currency pegs. Section 3 briefly reviews the literature on the causes of the ERM crisis and assesses the credibility of the EMS using Svensson's (1991) model of target zone credibility. Section 4 highlights features that enhance the credibility of an EMS-style monetary system to avoid financial crises. Subsequently, Section 5 investigates whether East Asian countries would be able to meet these requirements in order to create a stable East Asian monetary system. The final section concludes.

2. The problem with pegs

The sustainability of any exchange rate fix basically depends on its credibility, that is, both foreign and home agents must be convinced that the peg can and will be maintained for a long period of time. This can be demonstrated with a simple monetary model of the exchange rate (c.f. Rogoff 1998) with

(2.1) $m_t - s_t = \eta\ [i_t - i_t^*]$

(2.2) $E_t\,(s_{t+1} - s_t) = i_t - i_t^*,$

where m_t is the log of the domestic money supply, s_t is the log of the exchange rate, i_t is the home nominal interest rate, i_t^* is the foreign nominal interest rate, and $E_t(s_{t+1}\text{-}s_t)$ is the expected rate of change of the log of the exchange rate. If the peg is fully credible, then $E_t(s_{t+1}\text{-}s_t) = 0$, and thus $i_t = i_t^*$. But if investors, for whatever reasons, believe that the current peg will not be maintained and that the exchange rate will be allowed to depreciate in the near future, then $E_t(s_{t+1}\text{-}s_t) > 0$ and $i_t > i_t^*$. This implies that if market participants expect the exchange rate to depreciate in the future, the peg can only be maintained through a rise in domestic interest rates. Theoretically the monetary authorities can infinitely defend the peg by reducing domestic high-powered money supply, by contracting domestic credit, and through intervention in the foreign exchange market (as long as they do not run out of international reserves or credit lines).

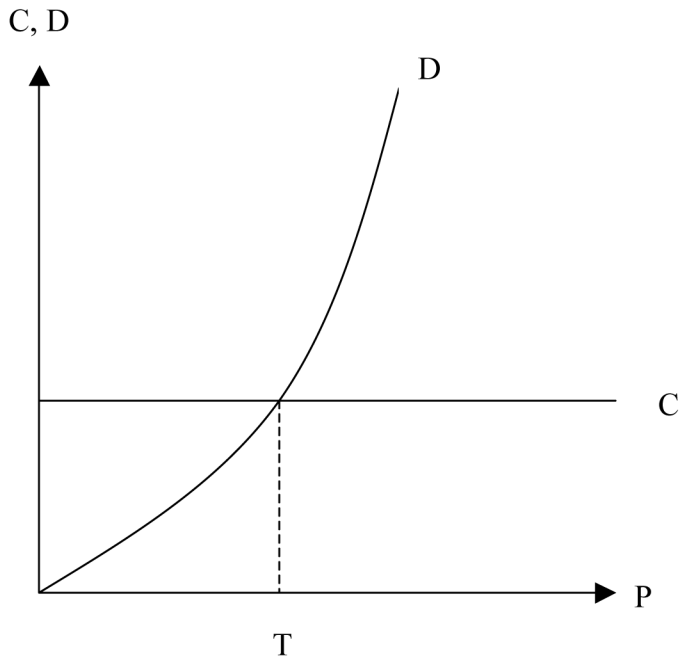
Even though an unconditional defense of a fixed exchange rate is always technically feasible, what is relevant for the stability of the exchange rate is not the technical feasibility, but rather the perceived costs of defending the parity. A sustained rise in short-term interest rates can have fatal consequences for the domestic banking sector and can sharply dampen aggregate demand and investment activity. As Buiter et al. (1998, p. 85) point out, "[i]t is because the authorities care about the side-effects of drastic monetary tightening that speculators can prevail."

There is a threshold point where defending a peg becomes too costly, and investors know this. This is where the speculative element comes in. Models of self-fulfilling currency crises (Obstfeld 1996) have theoretically shown that currency crises can occur even in the

absence of balance-of-payment problems (the trigger of a crisis as described in first-generation models following Krugman (1979) et al.). Even if "the fundamentals are right", speculative action by market participants could challenge monetary authorities so much that the latter would be forced to adopt austerity policies that would completely choke off the domestic banking sector and economy. Political opposition would become so strong that the costs of keeping the peg become unbearable. Because market participants know that monetary authorities typically have other objectives besides the exchange rate fix, i.e. the health of the banking system and the economy in general, they know that sustained speculative pressure may eventually cause the monetary authorities to back down and let the currency float, thereby making expectations self-fulfilling. In a situation where the people go to the streets and start banging their saucepans, like in Argentina in 2001, no government will allow its central bank to indefinitely defend a peg.[2] It is the situation of a one-way bet that invites speculators to attack a currency peg: if the peg is abandoned, this results in speculation profits; if it stays, the speculators only bear transaction costs in the form of short-term positions in foreign currency.

The situation can be described by a simple graphical model, which depicts the relationship between the costs D to defend a parity and the speculative pressure P (Figure 1). Defense costs (i.e., dampening economic activity through raising interest rates, loss of reserves, debt accumulation) increase exponentially with rising speculative pressure. Defense costs also depend on the size of shocks, output gap, flexibility of labor markets etc. The cost C of giving up the peg is a loss of reputation (political prestige, etc.), which here is assumed to be fixed. As long as $P < T$, the exchange rate peg is credible, because the costs of losing reputation in the case of abandoning the peg exceed the adjustment cost to defend it. If pressure rises beyond the threshold point T where defense costs equal the cost to give up the peg, the peg is no longer credible and thus likely to fail.

Figure 1: Speculative pressure and the costs of defending a peg



Of course, things are not that simple. In reality, the occurrence and timing of a speculative attack are indeterminate, depending on expectations and strategic uncertainty regarding the coordination of the private sector. According to second-generation models of self-fulfilling currency crises, multiple equilibria are possible. If the fundamentals are sufficiently strong, no attack will occur; if the underlying fundamentals become sufficiently weak, uncertainty disappears and there will be only one equilibrium in which an attack will instantly occur. But in the intermediate range, however, an attack is a probabilistic phenomenon. In that respect, second-generation models are very similar to first-generation models and predict that countries with weaker fundamentals are more crisis-prone than countries with strong fundamentals. The difference is that seemingly minor random events, or "sunspots" (Obstfeld 1996), could shift the exchange rate peg from a position of credibility into a position where it becomes unsustainable.

In a market in which agents are atomistic (i.e., have small net worth, are credit-constrained, and do not collude), a single speculator would find it impossible to build up enough pressure on his or her own to force the authorities to abandon the peg. A coordinated speculative attack is impossible in the absence of

common knowledge.[3] No one will attack unless he or she expects a sufficient number of other agents to do the same at the same time. Only if devaluation expectations are sufficiently strong, will joint market action lead to an attack. This will only be the case in a situation where underlying economic or political weaknesses give rise to such expectations.

As Rogoff (1998, p. 157) points out, "[t]he fine line between a successful currency defense and a costly collapse shows the profound strategic problem facing a monetary authority whose currency is subject to speculative attack." The question then is: what defines this fine line, i.e., what makes an exchange rate fix credible and thus successful? The first and most straightforward answer is: strong fundamentals. If the fundamentals are sufficiently strong, there is no ground for speculation. A second answer refers to the arrangements that determine the credibility of the peg, and this is of particular importance in the case of regional arrangements. To identify the features of successful exchange rate arrangements, the next sections looks at the EMS, widely considered a successful exchange rate arrangement until its de facto collapse during the 1992/93 crisis.

3. The ERM crisis and credibility of the system

3.1 Brief overview of the EMS

The EMS was set up in March 1979[4] with the aim of creating a "zone of monetary stability in Europe".[5] The three main features of the EMS were (1) the ERM, (2) the European Currency Unit (ECU), and (3) financing facilities. The ERM consisted of a grid of bilateral exchange rate bands between each of the member currencies. Initially, each currency could fluctuate within a +/- 2.25 band (+/-6% for the Italian lira as well as for Spain, the UK, and Portugal, who joined the ERM later) around its assigned bilateral central rate against other members of the ERM. As a reaction to the 1992/93 ERM crisis, the fluctuation margins were widened to +/-15% for all currencies in August 1993. Once two currencies reached the bilateral exchange rate margin, the authorities of both countries were obliged to intervene or take other appropriate measures to keep the exchange rate within the band.

The ECU was a weighted basket currency of the member currencies and served as an "indicator of divergence" within the ERM. Each of the EMS currencies was given a central weight in the ECU basket, reflecting each country's economic importance, its share of intra-regional trade and its commitment in the system's financing facilities. To ensure that each member country had the necessary resources to intervene in defense of the bilateral exchange rate parities, extensive financing mechanisms were created. Twenty percent of the member countries' gold reserves had to be deposited with the European Monetary Cooperation Fund (EMCF) in exchange for the equivalent value in ECUs. Furthermore, three kinds of credit facilities were created: the very short-term facility (VSTF), the short-term monetary support (STMS), and the medium-term financial assistance (MTFA). The importance and limits of such support mechanisms will be discussed in Section 4.

The institutional setting of the EMS did not change substantially over time. Table 1 provides an overview of events in the EMS. After a turbulent start which was accompanied by much skepticism regarding the system's success, and which saw seven realignments taking place between the spring of 1979 and the spring of 1983, the EMS entered a period of relative stability. The emphasis was increasingly on nominal and real convergence and coordination of monetary policies to support exchange rate stability. The exchange rate as an external anchor proved to have a disciplining effect on national policies, and weak currency members with high-inflation histories successfully used the EMS as a way of importing the Bundesbank's anti-inflationary credibility. While average inflation rates between 1979 and 1983 ranged from 4.9% in Germany to 17% in Italy (Belgium 7%, Denmark 10.1%, France 11.8%, Ireland 15.8%, Netherlands 5.2%), they markedly decreased to a range of 1.1% in Germany and the Netherlands to 7.1% in Italy (Belgium 3.0%, Denmark 4.6%, France 4.3%, Ireland 4.6%) between 1984-88 (Tietmeyer 1998, p. 44).[6] The EMS seemed to have reached its aim of being a "zone of monetary stability".

Between 1983 and 1987, only four realignments were required, significantly fewer than in the first four years. After the January 1987 realignment, the EMS entered a new stage with additional participants (reflecting its increasing attractiveness) and without realignments for 67 months.[7] Giavazzi and Spaventa (1990) speak

of the "new" EMS. The Single European Act of 1986 pushed for liberalizing financial markets, including the removal of capital and exchange controls until July 1990. In the Basle-Nyborg Agreement of September 1987, the financing facilities for intervention obligations were substantially augmented. Credit facilities were extended for longer periods, and countries were permitted to draw on credits before a currency reached the limits of its EMS band.[8] Interventions were increasingly used to keep exchange rates within the bands to avoid realignments. Interventions to support weak EMS currencies became a regular feature, and the EMS developed into a quasi-monetary union (Schiemann 1993). Even at the height of the EMS crisis in September 1992, attempts to avoid a realignment of the peseta, escudo, and punt were made through the introduction of temporary capital controls.[9]

Table 1: A chronology of events in the EMS

Year	Date	Event
1979	Mar13	EMS starts operation (+/- 2.25% band for all participants except the Italian lira with a +/- 6% band)
	Sep 24	German mark (+2%), Danish krone (-2.9%)
	Nov 30	Danish krone (-4.76%)
1981	Mar 23	Italian lira (-6%)
	Oct 05	German mark (+5.5%), Dutch guilder (+5.5%), French franc (-3%), Italian lira (-3%)
1982	Feb 22	Belgian franc (-8.5%), Danish krone (-3%)
	Jun 14	German mark (+4.25%), Dutch guilder (4.25%), French franc (-5.75%), Italian lira (-2.75%)
1983	Mar 21	German mark (+5.5%), Dutch guilder (+3.5%), Belgian franc (+1.5%), French franc (-2.5%), Italian lira (-2.5%), Irish punt (-3.5%)
1985	Jul 22	Belgian franc (+2%), Danish krone (+2%), German mark (+2%), French franc (+2%), Irish punt (+2%), Dutch guilder (+2%), Italian lira (-6%)
1986	Apr 07	German mark (+3%), Dutch guilder (+3%), Belgian franc (+1%), Danish krone (+1%), French franc (-3%)
	Aug 04	Irish punt (-8%)
1987	Jan 12	German mark (+3%), Dutch guilder (+3%), Belgian franc (+2%)
1989	Jun 19	Spanish peseta enters with +/-6% band
1990	Jan 08	Italian lira (-3.7%) and adopts +/-2.25% band
	Oct 08	British pound enters with +/-6% band
1992	Apr 06	Portugese escudo enters with +/-6% band
	Sep 14	Belgian franc (+3.5%), German mark (+3.5%), Dutch guilder (+3.5%) Danish krone (+3.5%), Portugese escudo (+3.5%), French franc (+3.5%), Irish punt (+3.5%), British pound (+3.5%), Itlaian lira (-3.5%)
	Sep 17	British pound and Italian lira suspend membership of ERM, Spanish peseta (-5%)
	Nov 23	Portugese escudo (-6%), Spanish peseta (-6%)
1993	Feb 01	Irish punt (-10%)
	May 14	Spanish peseta (-8%), Portugese escudo (-6.5%)
	Aug 02	widening of margins of fluctuations to +/-15% for all ERM currencies; Germany and Netherlands agree to bilaterally maintain their currencies in the +/-2.25% band
1995	Jan 09	Austrian schilling enters with +/-15% band
	Mar 06	Spanish peseta (-7%), Portugese escudo (-3.5%)
1996	Oct 14	Finish markka enters with +/-15% band
	Nov 25	Italian lira rejoins with +/-15% band
1998	Mar 16	Irish punt (+3%)
	May 02	selection of qualifying members for European Monetary Union (EMU)
1999	Jan 01	EMU comes into effect

Source: Pilbeam (1998, p. 446)
Note: - indicates a devaluation, + indicates a revaluation

The period of tranquility did not last forever: after five and a half years of nominal exchange rate stability, the EMS tumbled into its most severe crisis in its then fourteen-year history. Following the unexpected rejection of the Maastricht treaty by the Danish voters in a national referendum in June 1992, tensions in the foreign exchange markets increased, and ultimately two of the ten EMS currencies – the Italian lira and the British pound – were driven out of the system, while the Spanish peseta, the Portuguese escudo, and the Irish punt were devalued involuntarily.[10]

3.2 Explanations of the crisis

The debate over the causes of the ERM crisis is centered around two lines of explanations, based on first-generation and second-generation models of currency crises respectively. These two explanations, which stress the importance of fundamentals and the shift in investor sentiments respectively, will be briefly outlined before the paper turns to an assessment of credibility in the ERM.

3.2.1 Fundamentals: first-generation models

First-generation models basically view financial crises as a result of weak fundamentals, which antagonize the pursuit of an exchange rate peg. Stable exchange rates must be based on sound economic conditions, that is, authorities must pursue policies consistent with the requirements of a peg. Otherwise, fixed exchange rates will sooner or later become unsustainable and a revaluation will become unavoidable.

Tietmeyer (1998, p. 47) argues that "unfortunately […] some European countries did not heed this lesson, especially at the beginning of the nineties. Diverging prices and costs were not sufficiently reduced, whereas exchange rates remained nominally stable. Such differences largely continued to exist, meaning that the currencies of countries with lower inflation rates depreciated in real terms, whereas the currencies of less stability-conscious countries in some cases appreciated sharply in real terms." The persistence (or recurrence) of high inflation and rising labor costs in some EMS countries accordingly eroded their competitiveness and created balance-of-payment problems, eventually leading to a crisis.[11]

The Danish referendum, from that perspective, "suddenly made the markets aware of the pent-up problems of divergence" and led to a "rediscovery" of the exchange rate risk (Tietmeyer 1998, p. 49). Seen from this angle, the crisis was purely a result of mounting divergence within the EMS.

Tietmeyer (1998) recalls that the Bundesbank continuously pointed to the growing divergences in the EMS and took a stand against the illusion of de facto monetary union, in which, according to prevailing opinion, no more parity changes would take place. For instance, the Bundesbank wrote in its 1990 annual report:

> "To the extent that the stability of exchange rates or even the pronounced strength of a number of partner currencies that do not belong to the "hard core" of the EMS can be explained essentially by inflation-induced higher rates of interest, it can be basically justified only if it is consolidated by a domestic economic policy that is durably geared to stability. If success is not achieved in coping with the structural causes of inflation within a reasonable period of time, it will probably become increasingly difficult over the long term to avoid having recourse to exchange rate adjustments. […] This explains why a currency union that is not based on durable progress in the direction of convergence will remain under the threat of tensions. For this reason, changes in central rates within the EMS should not be excluded in principle during the transitional stages towards bringing about economic and monetary union." (Deutsche Bundesbank 1990, p. 66)

Eichengreen and Wyplosz (1993) test the Bundesbank view by applying three competitiveness measures (bilateral unit labor costs relative to Germany, multilateral relative unit labor costs adjusted by the business cycle, and the ratio of traded to non-traded goods prices at home) for EMS countries plus Sweden and Finland. They find limited support of real overvaluation. Only for Italy do they find some evidence that wage inflation was inadequately compensated by increases in labor productivity. They conclude that the divergent movement of prices and labor costs played only a limited part in the crisis.

Government deficits and debt to GDP ratios (Table 2) also give no convincing answer to why the Italian, British, Irish, French, Spanish, and Portuguese currencies (to name just the most severely affected ones) came under so much pressure in autumn 2002. As Eichengreen (2001, p. 13) reasons, "[d]eficits might have been excessive, but this had been true before the Danish referendum, and there was no change in fiscal stance subsequently."

Table 2: Deficit/GDP and Debt/GDP for ERM Countries

	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.(
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	114.4	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.(
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
UK	2.6	6.1	7.9	6.5	4.2	35.5	41.4	47.4	51.6	53.4

Source: Buiter et al. (1998, p. 54)

3.2.2 Speculation and self-fulfilling prophecies: second-generation models

The second line of explanation emphasizes the role of speculation and self-fulfilling prophecies. Central to this approach is the interpretation of the Danish referendum as a signal to financial markets that concerted speculative pressure could effectuate a demise of currency pegs in the EMS. The weaknesses of fundamentals were known also before the referendum, and the only effective change was in expectations with respect to the realization of a monetary union. Viewed from that angle, the crisis was not the result of fundamental disequilibria, but rather of the market's perception that the Danish referendum had moved the EMS from a position of credibility into a position of vulnerability (Eichengreen 2001).

Markets knew that exchange rate stability within the EMS was not the authorities' sole objective, and that they also cared about the health of the banking system and the economy in general (cf. Section 2). With the European Monetary Union (EMU) in sight, the prospective benefits of keeping the exchange rate fixed (one of the Maastricht criteria for qualification for EMU) were high. Monetary authorities were thus expected to be more willing to accept slower growth and higher unemployment as the price for

defending the exchange rate and thus their chances of participation in the EMU. This calculation changed with the negative outcome of the Danish referendum. When polls for the French referendum also signaled a collapse of the Maastricht treaty, the realization of the EMU suddenly became very uncertain.

In addition, slowing economic growth and high unemployment increased the costs of defending the peg (Table 3). This situation made room for speculators to test the durability of the system. Bad crisis management, i.e. the inability of policymakers to adequately cope with the situation and convince markets, did the rest of the damage.

Table 3: Unemployment rates (% of civil labor force)

	1987-89 average	1990	1991	1992
Belgium	10.0	7.6	7.5	8.2
Denmark	6.6	8.1	8.9	9.5
Germany (western)	6.1	4.8	4.2	4.5
France	9.9	9.0	9.5	10.0
Greece	7.5	7.0	7.7	7.7
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
Spain	19.1	16.3	16.3	18.4
UK	8.7	7.0	9.1	10.8

Source: Eichengreen (2001, p. 35)

3.3 Testing ERM credibility

Having discussed the background of the crisis and the main lines of explanations, we will now examine the credibility of the EMS, so as to allow an appraisal of what makes and what undermines the credibility of regional monetary systems.

Most assessments of target zone credibility rely on the analysis of interest rate differentials based on a simple model by Svensson (1991).[12] Assuming the absence of risk premia, the uncovered interest parity condition states that interest rate differentials on similar assets with the same maturity must be equal to the expected rate of currency depreciation over the period so that

$$(3.1) \quad (1+i_t^{\tau})^{\tau/12} = (1+i_t^{*\tau})^{\tau/12} \frac{E(S_{t+\tau})}{S_t},$$

where i_t^{τ} is the domestic-currency interest rate at time t on an asset maturing at $t+\tau$, $i_t^{*\tau}$ is the corresponding rate on an asset denominated in the currency of the foreign currency, S_t denotes the spot exchange rate in period t defined in terms of domestic currency per units of foreign currency, and $E(S_{t+\tau})$ is the expected exchange rate at time $t+\tau$.

If the exchange rate is restricted to a band with lower and upper bounds $\underline{S}$ and $\overline{S}$ so that

$$(3.2) \quad \underline{S} \le S_t \le \overline{S},$$

this implies that the domestic interest rate i_t^{τ} will be restricted to a band

$$(3.3) \quad \underline{i_t^{\tau}} \le i_t^{\tau} \le \overline{i_t^{\tau}}.$$

Rearranging (3.1), the lower and upper bounds of the domestic interest rate band are then given by

$$(3.4) \quad \underline{i_t^{\tau}} = \left(1+i_t^{*\tau}\right)\left(\frac{\underline{S}}{S_t}\right)^{12/\tau} - 1 \text{ and}$$

$$(3.5) \quad \overline{i_t^{\tau}} = \left(1+i_t^{*\tau}\right)\left(\frac{\overline{S}}{S_t}\right)^{12/\tau} - 1.$$

The band can be thus written as

$$(3.6) \quad \left(1+i_t^{*\tau}\right)\left(\frac{\underline{S}}{S_t}\right)^{12/\tau} - 1 \le i_t^{\tau} \le \left(1+i_t^{*\tau}\right)\left(\frac{\overline{S}}{S_t}\right)^{12/\tau} - 1.$$

Computing these boundaries for a set of EMS countries vis-à-vis Germany gives the results presented in Figures 2-5. The spikes indicate realignments of the respective currencies. As can be seen

in Figure 2, the eurofranc interest rate was outside the credibility boundaries for almost all the time until March 1990 (except for a credibility blip after the April 1986 realignment), implying that the FF/DM parity lacked credibility virtually at all times. Interestingly, it was within the credibility band since March 1990 and remained there (with outliers in December 1990 / January 1991 and December 1991) during the months preceding the crisis. Only in August and September 1992, at the height of the crisis, did it again slip outside the credibility boundaries. Except for a brief return to credibility in October 1992, it remained outside the boundaries until February 1993.

The case of the eurolira interest rate is pretty similar (Figure 3): it remained outside the credibility zone for most of the time, and only experienced short periods of credibility (April 1986 – April 1997, May 1989 – September 1989, February 1990 – August 1990, and February 1991 – September 1991). From September / November 1991, it remained outside the band until Italy suspended its membership in the ERM on September 17, 1992.

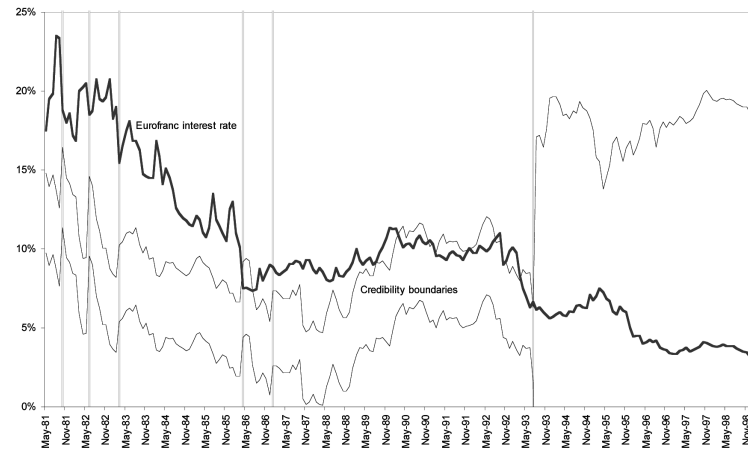
In contrast to the franc and the lira, the Dutch guilder, part of the "hard core" of the EMS, was always credible (Figure 4). The pound also remained within its credibility boundaries throughout its short ERM membership (Figure 5). Only in August 1992, just before suspension of its membership, did it lose credibility, suggesting that money markets anticipated a devaluation of the pound.

According to these results, the ERM does not appear much less credible (or: not more *non-credible*) in the months before the crisis than before. For France, paradoxically, the crisis occurred when the system, according to this test, was credible for the first time. Also, the abrupt swing from credibility to non-credibility in the British case in August 1992 cannot be explained by significant changes in economic conditions. This supports the notion that the crisis was rather caused by a shift of market sentiments and expectations.

Using trend-adjusted measures of realignment expectations, which are also based on interest differentials, Rose and Svensson (1994) similarly find that the credibility of ERM pegs varied significantly over time, mostly for reasons which cannot be

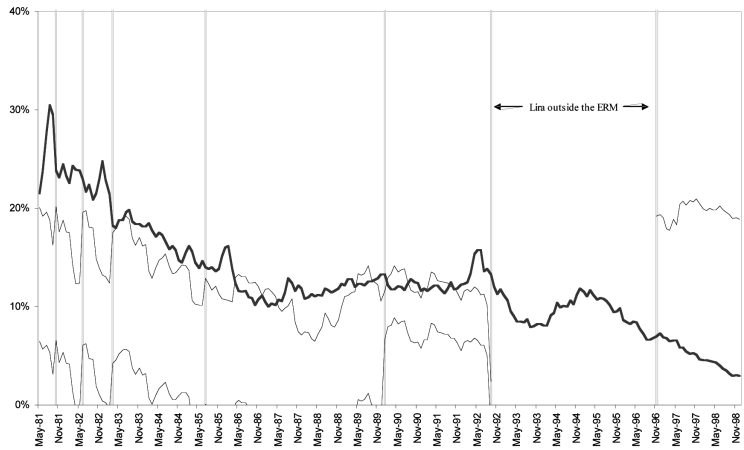
well explained by standard macroeconomic variables. While higher inflation differentials vis-à-vis Germany seem to reduce credibility, realignment expectations generally appear to be relatively disconnected from macroeconomic phenomena, to "a degree that is disconcerting from an economist's point of view" (Rose and Svensson 1994, p. 186).[13] Interestingly, they find that much credibility seems to be shared by all members of the system, but that this general credibility factor moves significantly over time, frequently reacting to non-economic events and not moving consistently in response to events that economic theory would consider relevant.[14]

Figure 2: 12 month eurofranc interest rate and credibility bounds



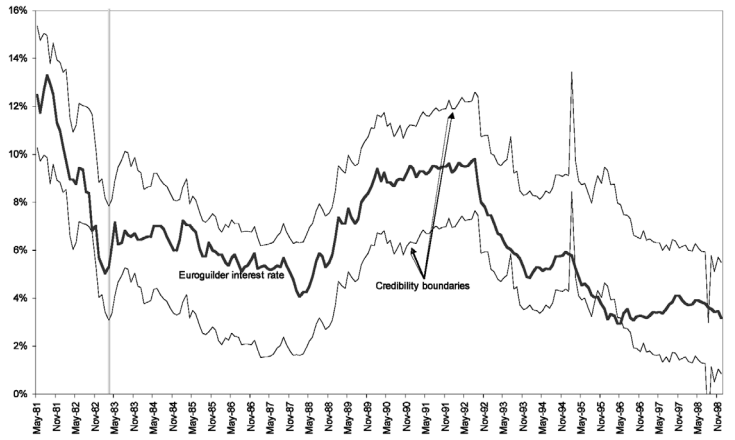
Source: Own calculations with data from BIS and Global Financial Database

Figure 3: 12 month eurolira interest rate and credibility bounds



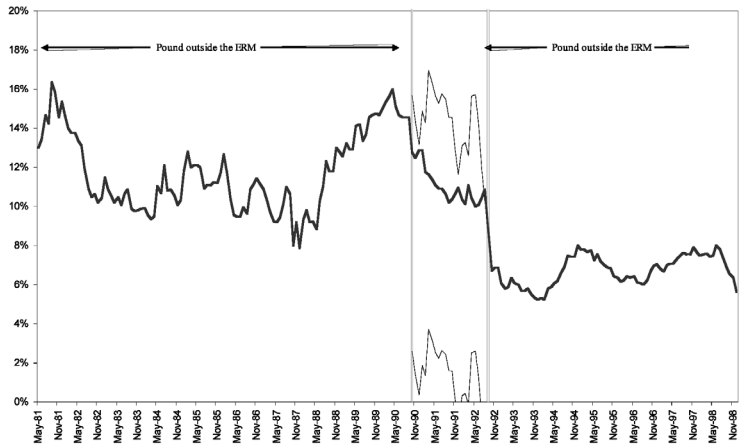
Source: Own calculations with data from BIS and Global Financial Database

Figure 4: 12 month euroguilder interest rate and credibility bounds



Source: Own calculations with data from BIS and Global Financial Database

Figure 5: 12 month euroguilder interest rate and credibility bounds



Source: Own calculations with data from BIS and Global Financial Database

A review of the literature on the ERM crisis and an analysis of ERM credibility have shown that economic variables only go half way in explaining the occurrence and timing of the ERM crisis. This suggests that at least part of the success and stability of the EMS/ERM, but also the causes for its eventual collapse, seem to be attributable to its very design and how it was run by policymakers. The remainder of the paper will therefore discuss the design of the EMS/ERM to identify features that add to the credibility of such a system in order to understand the challenges for East Asian countries that are contemplating the creation of an Asian Monetary System.

4. Is an ERM-style system feasible nowadays?

> "What was possible in Europe in the 1980s, a European Monetary System of multilateral exchange rate pegs with periodic realignments, was possible then only because of the widespread maintenance of capital controls. What was possible in Europe in the 1990s, a European Monetary System of somewhat wider bands, was possible only because a credible commitment to move to monetary union in short order anchored expectations. No EMS-style arrangement will be viable elsewhere in today's world of high capital mobility."

This quotation of Eichengreen (1998, pp. 22-3) gives a very clear answer to the question posed above. Yet we will try to provide a more differentiated answer and identify features that could enhance the viability and credibility of an EMS-style monetary system in today's world. The following aspects will be discussed:

- Cooperation between the monetary authorities of the countries involved
- Independent central banks and robust monetary rules
- Flexibility and the importance of realignments
- Fluctuation margins
- Support funds
- Capital controls

Cooperation between the monetary authorities of the countries involved

Buiter et al. (1998) highlight the fact that the ERM crack-up was a crisis of an exchange rate *system,* rather than the collapse of a collection of unilateral pegs individually pursued by a number of countries. They see a central cause of the crisis in the lack of coordination of monetary and exchange rate policies within the system. The crisis, they argue, "was in the first instance a conflict among monetary authorities and a failure of the European system as a policy coordination mechanism" (Buiter et al. 1998, p. 134).

Following the German unification, the German government pursued excessive fiscal policy, with the consequence of rising inflation. The Bundesbank responded with a high interest rate policy that increased the strain on the Bundesbank's weak ERM

sisters (Bank of England and Banca D'Italia) and ultimately led the lira and sterling to resign from the ERM, because the pursuit of such high interest rate policies would have dampened their economies. In this respect, the crisis was the result of the system's inability to find a cooperative response to a shock that increased the asymmetries within the system.

A cooperative solution could have been a generalized ERM realignment with a conjunct cut of interest rates by Germany. The Bundesbank's interest rate cut would have given leeway to the UK and Italy not to raise interest rates further, and a modest realignment involving all ERM currencies would have lowered German import prices, which would have helped to ease inflationary pressures in Germany. Furthermore, it would have protected the other ERM countries against the destabilizing shock of the UK's and Italy's exit that left the ERM in troubled waters for another year.

Such a bargain, a German interest rate reduction in return for a general realignment of ERM currencies, had been negotiated at the ministers of finance meeting in Bath on September 5-6, 2002, but yielded no positive results (Eichengreen 2001).[15] A cooperative solution was not achieved, and the crisis occurred. Also Padoa-Schioppa (1994, pp. 14-5) believes that

> "The difficulties encountered by the ratification process precipitated the crisis of the ERM but were not its underlying cause, which was plainly traceable to what in academic jargon is called a 'co-ordination failure'. […] There was the refusal to accept a general realignment and even to call a meeting of the Monetary Committee or of the ministers and central-bank governors when, in September 1992, a general realignment might have calmed the markets. The realignment procedure, once embarked on, did not produce a credible new grid. At various times, and in various ways, through unhelpful declarations that exited markets as well as through policy decisions that caused unnecessary friction, the system was destabilized by its very custodians."

Contradictory statements of the parties involved certainly did not help to convince markets of the continued smooth functioning of the system. This point is illustrated by an episode described by Buiter at al. (1998, pp. 56-7):

> "In talking to the press [after the Bath summit], the British chancellor [Lamont] referred to a German "commitment" not to raise interest rates. The use of the term "commitment" did not please the president of the Bundesbank. One day later, Schlesinger stated in an interview that the Bundesbank position had in fact not changed since August. According to the reports of the financial press, "Lamont's scuffle with the Bundesbank came at a particular sensitive time and led money managers, corporate treasurers and others in the currency markets to reevaluate their strategies."[16]

Such contradictory statements clearly undermine the credibility of any system and make it more vulnerable to attack. It is the typical situation of a crisis in which tensions arise, and in which the parties involved come under stress. It is therefore important to lay out the rules in order to ensure a cooperative mechanism for finding a solution before a crisis has arrived. Effective policy coordination is an indispensable necessity for gaining and maintaining credibility.

Acknowledging the character of the ERM crisis as a crisis of an exchange rate system clearly shifts the focus of attention toward the management of the system, which in this case had been relatively poor. Speculation had been given ground because of the cacophony of the policy-makers responsible for defending the system. From this point of view, the characterization of the ERM crisis as a second-generation crisis triggered by self-fulfilling speculation is incomplete.

Independent central banks and robust monetary rules

The long-running debate over rules versus discretion in the conduct of monetary policy has nowadays been decided in favor of a rules-based approach, with all major central banks following more or less well-defined monetary rules.[17] Irrespective of an external exchange rate goal, (de facto) central bank independence and a clear monetary objective function are state of the art of modern central banking. Establishing an independent central bank with strong inflation aversion is an important way to keep down inflationary expectations. While beneficial for any economy, this is particularly important for countries with an external anchor, because central bank independence provides credibility to the peg.

The credibility of a peg requires that any exchange rate change, which is in effect a break of the central bank's promise to keep the parity fixed, should only occur in response to extreme disturbances. Devaluations resulting from self-fulfilling speculative attacks must be ruled out. Hence, it is not sufficient to preclude balance-of-payment crises through the sound conduct of current and past policies – anticipated future policies matter as well. To exclude speculative attacks, robust monetary policy rules are needed. A robust monetary policy rule is one that obviates changes in monetary and exchange rate policies that are not grounded on fundamentals.

Flexibility and the importance of realignments

A further, crucial lesson of the ERM crisis is the necessity to incorporate a certain degree of flexibility into the system. Of particular importance is the capacity to undertake relative price adjustments, that is, the possibility of realignments.

Pegged exchange rate systems face difficulties when significant changes are required in the relative prices of domestic and foreign goods, of traded and non-traded goods, and of labor and commodities. If the nominal exchange rate is fixed, adjustments have to occur through changes in wages and prices (or the movement of labor). If wages and prices are rigid (at least downwards) transitional output losses may result. A revaluation can bring about the needed price adjustments at once and with fewer frictions, because money illusion will make changes in the relative prices less obvious and painful. If labor markets are not sufficiently flexible and prices are sticky, pegged exchange rate systems can only be sustained if nominal exchange rate adjustments, i.e. revaluations, are allowed for in the case of exceptional shocks.

As Eichengreen (1996, p. 163) notes, when the EMS was created in 1979, Germany had a third of a century of experience with fixed exchange rate regimes, from the Bretton Woods system and the snake, suggesting that deficit countries would hesitate to adjust. Germany hence acknowledged the necessity of allowing for realignments within the system.

"Adjustments of central rates"[18] was indeed an explicit and frequently used instrument of the EMS until the January 1987 realignment. Jochimsen (1993, p. 187) criticizes that these rules "were forgotten during the second half of the 1980s, where one mistook the goal of keeping exchange rates stable as already constituting the result of actually holding them stable, without regard to the corresponding exigencies of adjusting domestic fiscal policies and collective bargaining accordingly." Similarly, Tietmeyer (1998, p. 52) scathes that "[m]aintaining unrealistic central rates for too long proved to be the Achilles' heel of the EMS. Thinking in terms of political prestige and national honor played a thoroughly significant role in this."

The literature on exit strategies[19] highlights that realignments can be undertaken without undermining the credibility of the system if they are undertaken only in exceptional circumstances and if the cause can be directly observed or otherwise independently verified. Furthermore, moral hazard from the authorities' side must be excluded. The German unification was such a shock, and the Bundesbank indeed argued that it was possible to realign in response to this shock without undermining the credibility of the EMS (Eichengreen and Wyplosz 1993, p. 61). But conflicting views and national pride hindered a general realignment. This failure to achieve a general realignment led to the crisis and illustrates that it is "absolutely essential to de-politicize the fixing of exchange rates" (Jochimsen 1993, p. 187). In addition, it exemplifies the desirability of generating a discussion on parity changes in good times (Tietmeyer 1998, p. 52).

Fluctuation margins

An aspect also related to the flexibility of exchange rate systems is the matter of fluctuation margins. Krugman (1991) shows that a target zone can lead to an effect which he calls "target zone honeymoon": assuming that exchange rates are at least partly determined by the formation of expectations, he shows that the very existence of a target zone can have a stabilizing effect on the exchange rate. When the exchange rate approaches the upper or lower band, market participants will expect the central bank to intervene, so that the exchange rate will move away from the band. These expectations will then suffice to drive the exchange rate away from the band, without need for intervention by the central

bank. This honeymoon effect, however, depends on the credibility of the target zone. If it lacks credibility, the market participants will at best take a wait-and-see approach, or otherwise launch an attack, in expectation of an overshooting of the exchange rate, in case that the peg is abandoned. The system could thus cause the crisis it was created to prevent.

In this context, the width of the band is of great importance. Narrow bands allow for risk-free one-way bets, creating incentives for speculative attacks. Wider bands, in contrast, make currency speculations more risk-prone, since they allow for a reversal of exchange rate movements. While wider bands also reduce the stabilizing effects of target zones, they sharpen the awareness of the stability policy response to be borne by the countries themselves, by making convergence deficits in the member countries manifest more easily (Tietmeyer 1998, p. 50). To reduce the susceptibility of a target zone system, it is hence better to choose wide exchange rate bands than bands that are too narrow.

Support funds

As discussed in Section 2, austere interest rate policy can be used to defend a peg only to a limited extent. The only other means to defend the peg, besides capital controls, is the use of foreign reserves for intervention in the foreign exchange markets.

Building up large amounts of foreign reserves can certainly help to increase the credibility of a peg. Having a "war chest" emphasizes a country's ability to forcefully fend off speculative attacks. Holding reserves, however, is costly. Furthermore, even a country with a vast amount of reserves can reach its limits in the case of large speculative movements. Fortunately, in the case of a common exchange rate system, common support mechanisms are an additional way of ensuring markets that the peg can and will be defended.

For this reason, and also as a lesson from the experiences with the snake[20], the French secured a provision in the EMS Act of Foundation, authorizing weak governments to draw unlimited support from their strong-currency partners. In the conviction of Giscard, the French president, a European exchange rate system would only function if the burden was shared equally between the strong and weak currencies (Bernholz 1999, pp. 754-5).[21]

The EMS was hence established with a very short-term financing facility (VSTF), providing support that was "unlimited in amount". There is, however, a problem with central banks' mutual assistance. Supporting the weak currency has monetary policy effects on the country with a strong currency. Irrespective of whether the central bank intervenes itself or makes its own currency available to other central banks for intervention purposes, bank liquidity is expanded and controlling monetary expansion is therefore made more difficult.

It was exactly this reasoning that led the Bundesbank – with reference to the Emminger letter[22] – to curtail interventions during the EMS crisis. After heavy intervention in support of the attacked EMS currencies, it sensed its internal monetary stability under threat. By early September 1992, M3, the Bundesbank's target money aggregate, was rising at an annual rate of almost 10 percent, far above its target of 3.5 to 5.5 percent (Eichengreen and Wyplosz 1993, p. 110).

It is therefore important to understand that while support mechanisms can be an important tool to increase the credibility of a regional exchange rate system, they cannot substitute for economic policies that are consistent with the external exchange rate objective.

Capital controls

A final point to be raised is the matter of capital controls. Capital controls, for obvious reasons, make things much easier for policymakers who have to guard a pegged exchange rate regime. There has been growing support for the view that EMS-like systems cannot survive in the absence of capital controls. Capital controls, it is argued, played an important role in the functioning of the EMS:

> "In the 10 years between its creation in 1979 and 1990, when capital accounts were freed, there were 12 realignments, most of them involving several currencies. With few exceptions, these realignments came in the wake of speculative attacks, yet the system survived. The first attack that occurred after capital liberalization was lethal" (Wyplosz 2004, p. 262)

It is out of question that the handling of the 1992/93 crisis would have been facilitated and that authorities would have had more leeway to come up with solutions if there had still been capital controls. But one can also argue that once the avalanche had been set off, capital controls would not have changed much. As mentioned before, Ireland, Portugal, and Spain actually re-introduced capital controls during the crisis, but this did not prevent the punt, the escudo, and the peseta from remaining under speculative pressure and from facing devaluation in February (punt) and May (peseta and escudo).

Also, as argued earlier, a better and more cooperative crisis management could have avoided the crisis, or at least limited its damages. And finally, speculative attacks do not occur entirely out of the blue. If the system is credible, it is also sustainable.

5. Can East Asian countries fulfill these conditions?

Cooperation between the monetary authorities of the countries involved

Cooperation requires mutual trust and understanding. The institutions involved and their representatives need to develop a common ground from which to tackle conflicting issues in a constructive and solution-oriented way. National authorities must be willing to subordinate national policy goals, at least at times, for the higher common goal of stability of the common exchange rate system.

This is the most problematic of all issues in East Asia at the present time. Instead of trust, relationships between various countries are tainted with suspiciousness or even distrust. While the members of the Association of Southeast Asian Nations (ASEAN)[23] already constitute a highly heterogeneous group, this is even more the case when dealing with ASEAN+3 (ASEAN plus China, Japan, and Korea). The countries involved appear to be driven by differing strategic interests (cf. Volz 2005). This is particularly the case for China and Japan, both of which regard Southeast Asia as their own backyard. Both countries are eager to maintain or increase their influence in the region, and eye each other suspiciously. Squeezed in-between the two giants is Korea, trying to secure its economic position. The ASEAN countries too, fearing competition from

China's masses of underemployed, try to position themselves as attractive destinations of foreign direct investment and seek to maintain their status as thriving export nations.

It has not become clear as yet what set of countries could possibly pursue a strategy of explicit regional exchange rate cooperation. Different scenarios for a close grouping are thinkable (see Kim and Wang 2005 and Volz 2005), but while some overstrain even the most imaginative mind (for example, a monetary system involving both China and Japan), even in a scenario involving only the ASEAN countries it is hard to see how the mutual trust and understanding necessary for the creation and maintenance of a regional monetary system could be developed in the short run. Any talk about such a system, therefore, would need to address the medium term. Countries that struggle even to agree on relatively easy policy issues and that have problems to accomplish already agreed arrangements (think of the ASEAN free trade area) will find it very difficult to cooperate in such a sensitive area as exchange rate policy.

Independent central banks and robust monetary rules

De jure central bank independence is achieved relatively easily; all it needs is a government decree or law. But what really matters is *de facto* independence from the government. For many (South) East Asian countries, *de facto* central bank independence still seems a long way off. Nevertheless, this should not constitute an impediment to forming a regional monetary system. Indeed, the creation of such a system could be used as a strategy to implement strong, independent central banks – similar to the way several European countries used the EMS as a strategy of "tying one's hands" (Giavazzi and Pagano 1988) in order to overcome their inflationary past.

Flexibility and the importance of realignments & fluctuation margins

These aspects relate to the very design of the system, and there is in principle no reason to believe that East Asian countries are not capable of designing a robust monetary system. There is a danger, however, that conflicting interests of the participating countries would lead to murky compromises and result in deficiencies in the

design of the system. The rules of the system must be put straight, without room for interpretation. As clearly shown during the EMS crisis, any cracks in the design will lead to a bursting of the system if put under stress.

Support funds

Given the amount of foreign reserves the East Asian central banks have accumulated since the Asian crisis, it would be easy to create funds to complement a regional exchange rate system. The problem, again, lies rather on the political side. No country wants to risk losing money because of the hazardous behavior of its partners, so granting a partner access to one's own reserves involves a great deal of trust that the partner will refrain from cheating. Nevertheless, the region's efforts over recent years to create a network of bilateral lending arrangements under the Chiang Mai Initiative (CMI) show its capability to constructively cooperate. However, the sums pledged under the CMI so far are more symbolic than anything else, and the real commitment will be revealed when larger sums would be required.

Capital controls

As mentioned above, many economists today believe that a regional monetary system cannot survive in the absence of capital controls. Without doubt, capital controls make the maintenance of such a system easier, but capital controls as such will not be able to prevent the occurrence of a crisis. At present, most East Asian countries still retain some form of capital controls (cf. IMF 2005), which would facilitate the establishment of a regional exchange rate system. Capital controls, however, would not be able to make up for a flawed design of the system or compensate for a lack of cooperation between the central banks and other authorities involved.

6. Conclusions

Just as the EMS was built upon the lessons from the Bretton Woods system and its unsuccessful predecessor, the snake, the experiences with the EMS are worth being borne in mind when considering the desirability and feasibility of similar regional arrangements in today's East Asia.

When the EMS was set up, it was greeted with much skepticism regarding its viability. After all, "the Bretton Woods system had broken down for good reasons that were still valid when the EMS was invented" (Padoa-Schioppa 1994, p. 71). It nevertheless proved to be a success, at least for most of its time. One of the lessons Padoa-Schioppa (1994, p. 71) draws from the EMS experience is that

> "the EMS has shown that there is a way out of the dilemma often presented to policy-makers: whether to move back to some sort of Bretton Woods system of exchange rate relationships, which is inevitably too rigid and probably not feasible today, or to live in a world of totally unregulated exchange rate relationships, with all the problems, dangers, and difficulties that were a feature of the 1970s."

This paper has argued that, in contrast to the popular bipolar view on exchange rate choices, intermediate regimes in general and regional exchange rate systems à la EMS in particular should not generally be ruled out even in today's world of highly mobile capital. It has highlighted that the ERM crisis had been the crisis of an exchange rate system, and not simply the collapse of a collection of unilateral pegs triggered by self-fulfilling speculation. It has tried to show that there exist distinct features that add to the credibility of regional exchange rate systems, and argues that a system that is built upon the lessons of the EMS and which is managed very carefully and cooperatively could be both credible and sustainable even in the 21st century. A regional monetary system should hence not be ruled out per se when discussing monetary options for East Asian countries.

Of course, the requirements for successful pegs in general and regional exchange rate systems in particular are very high, especially if the countries involved have reached the stage of economic and financial development where it is conventional to remove capital controls. Some may argue that the requirements are too high. A very strong commitment is required from all parties willing to engage in a regional exchange rate system, and the willingness to subordinate internal economic objectives under the objective of exchange rate stability is essential. A crucial precondition for any regional monetary arrangement to be successful is a far-reaching consensus on policy preferences. This is the crux of the matter

for East Asia. For the time being, it is hard to see how East Asian countries could develop enough mutual trust and understanding to effectively run a regional exchange rate system and to rule out coordination failure. Creating a regional exchange rate system in East Asia under present conditions would most certainly end in a crisis.

Instead of directly creating such a system, East Asian countries should follow a gradual approach to monetary integration (assuming that monetary integration as such is politically desired). This would allow East Asian countries to get to know their potential partners and their policy preferences more closely before the going gets tough. A stepwise approach to monetary integration could first involve the regional (coordinated) adoption of currency baskets, flanked by a strengthening of financing facilities under the CMI and a further enhancement of regional surveillance mechanisms. Over time, the composition of the baskets could be harmonized among East Asian countries, and exchange rate bands could be introduced, developing a more formal regional exchange rate mechanism. Yet another option would be the introduction of a parallel basket currency, which could be used as invoicing currency for trade as well as for the denomination of bonds in a regional bond market.[24]

In the context of the ERM crisis, Tietmeyer (1998, p. 39) points out the original meaning of the Greek word *krisis*, meaning "decisive turning point", not implying a turn for the better or the worse. With that understanding, the ERM crisis can also be seen as a "curative purgation crisis" (Schiemann 1993, p. 1), which helped to remind European countries in the run-up to EMU of the importance of policy coherence and strong policy commitment to secure the credibility of the system. The Asian crisis had also been a turning point, leading to the understanding that a strengthening of the regional financial architecture is urgently needed and that cooperation on a regional level is a potentially promising way forward. In any case, the ERM crisis, just as all the other exchange rate crises that were to follow in the 1990s and early 2000s, should serve as a reminder and a warning to East Asian policy makers contemplating the creation of an East Asian monetary system – but it does not need to discourage such thoughts.

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Endnotes

[*] This is a revised and extended version of the paper "Pegs, baskets, and the importance of policy credibility: Lessons of the 1992/93 ERM crisis", which was prepared for a workshop on financial crises at the Oslo Summer School in Comparative Social Science Studies at the University of Oslo, August 2-8, 2004, and a conference on "Regional Monetary Cooperation and Coordination: The Experience in Europe and Feasibilities in Asia" at Fudan University, Shanghai, October 25-26, 2004. Financial support by DekaBank and the Fox International Fellowship at Yale University is gratefully acknowledged. The author would like to thank, without implications, Koichi Hamada, Carsten Hefeker, Juljan Krause, Manfred Nitsch, Hyun Song Shin, and participants at the Shanghai conference for valuable comments on earlier versions of the paper.

[1] Eichengreen and Bayoumi (1999, p. 347) ironically note that "the apostles of European monetary integration have chosen this time to bring their message to Asia".

[2] One should mention, however, that the Argentinean crisis was not triggered through self-fulfilling speculation and would thus be probably best described by a first-generation model emphasising the role of fundamentals.

[3] The coordinated attack problem is analysed in Morris and Shin (1997).

[4] The EMS succeeded the "snake", a flawed attempt to secure intra-European exchange rate stability in the face of mounting difficulties in sustaining the Bretton Woods system of global fixed exchange rates. The snake was put into operation in April 1972, only four months after the Smithonian agreement, the last and unsuccessful endeavour to rescue the Bretton Woods system through a widening of the band around the dollar from 2% to 4.5%.

[5] Resolution of the European Council of December 5, 1978 on the Establishment of the European Monetary System (EMS) and related matters (reprinted in Gros and Thygesen 1998, pp. 58-63). For details of the EMS see chapters two and three of Gros and Thygesen (1998), for instance.

[6] The decline in oil prices certainly helped fight inflation, but the main effect can be attributed to stabilisation policies (Tietmeyer 1998, pp. 44-5).

[7] Except for a technical adjustment of the lira in connection with the narrowing of the band width around the lira from +/-6% to +/-2.25% in January 1990.

[8] In fact, the Basle-Nyborg Agreement also called for undertaking small realignments more frequently, a recommendation which was never followed. The Agreement is reprinted in Gros and Thygesen (1998, pp. 104-5).

[9] Ireland banned foreign exchange trading for foreigners, and Spain required foreigners wishing to move short-term funds into Spain to make 100 percent non-interest bearing deposits at the central bank. Portugal also introduced capital controls (Schiemann 1993).

[10] Finland, which was not an EMS member at that time, was the first to come under pressure and to abandon its unilateral peg, with the result of a depreciation of the markka by 15 percent.

[11] The inflation convergence achieved in the mid-1980s indeed widened. The average inflation rate between 1987 and 1992 in the countries with the most stable prices, i.e. the Netherlands and Germany, were 1.9% and 2.4%, respectively, whereas the UK, Italy, Spain and Portugal, for example, had rates of 6.0%, 5.7%, 5.9%, and 10.8% (cf. Tietmeyer 1998, p. 47). This argumentation is often extended by acknowledging that the underlying problems were aggravated through the loose fiscal and tight German monetary policy following German political and monetary unification.

[12] See also Marston (1995).

[13] Eichengreen, Rose and Wyplosz (1994) also cannot find evidence of significant differences in the behaviour of key economic variables between crisis and non-crisis periods in the EMS. (But they do find such evidence for non-ERM observations.)

[14] Rose and Svensson (1994) also find a relatively high level of ERM credibility in the months preceding the crisis, which persisted until late August 1992. They conclude that the currency crisis of 1992 does not appear to have been anticipated by financial

markets. Also other research – such as Eichengreen and Wyplosz (1993), who use the forward exchange rate, or Campa and Chang (1996), who estimate realignment probabilities derived from option prices to measure market expectations – indicates that both private-sector agents as well as policy-makers were taken by surprise by the events of mid-September.

[15] The British Prime Minister John Major (1999, p. 323) accounts that Bundesbank president Helmut Schlesinger acknowledged Germany's willingness to cut interest rates in conjunction with a general realignment of ERM currencies but that France refused to go along (cf. Eichengreen 2001, p. 18). See also Eichengreen and Wyplosz (1993, pp. 111 ff.).

[16] Muehring (1992, p. 11).

[17] See for example Kydland and Prescott (1977) and Fischer (1990).

[18] Article 3.2 of the Resolution of the European Council of December 5, 1978 on the Establishment of the European Monetary System (EMS) and related matters (reprinted in Gros and Thygesen 1998, p. 59).

[19] See for example Eichengreen et al. (1998).

[20] The snake also contained support mechanisms, but as Eichengreen (1996, pp. 159-60) reports, "[t]he European Monetary Cooperation Fund [of the snake] possessed little authority, central bank governors being unprepared to delegate their prerogatives. Meeting separately as the Committee of Central Bank Governors, they were supposed to set guidelines for national monetary policies but did little more than coordinate foreign-exchange market intervention. In the end, there existed no regional analogue to the International Monetary Fund to monitor policies and press for adjustments. The absence of such an institution meant that the strong-currency countries could not be assured that their weak-currency counterparts would undertake policy adjustments. Therefore, the foreign support they were willing to provide was necessarily limited."

[21] The details of the envisaged extended support mechanism were indeed the key points mostly discussed when the decisions were being formulated in the second half of 1978 and early 1997 (Bernholz 1999, p. 755).

[22] The Emminger letter refers to a letter which Otmar Emminger, the Bundesbank president who signed the EMS agreement, wrote to the German government to ask for a clause permitting the Bundesbank to opt out from the EMS intervention obligations if they threatened the Bundesbank's mandate to secure price stability. The government acquiesced (see Eichengreen and Wyplosz 1993, pp. 109 ff.). The Bundesbank was heavily criticised for limiting its support at some stage. But as Eichengreen and Wyplosz (1993, p. 109) put it, "it is obvious that no central bank would ever commit unconditionally to unlimited lending."

[23] The members of ASEAN are Brunei, Cambodia, Indonesia, Lao, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Vietnam.

[24] On currency baskets in East Asia see Williamson (1999, 2006), Ogawa and Ito (2002), and Schnabl (2006). On a parallel currency approach see Eichengreen (2006).

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