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Exchange Rate Credibility and the Collapse of the ERM

 After the failure of the Bretton Woods international monetary system, the European community responded with a regional alternative to promote economic integration and growth within the continent. The Exchange Rate Mechanism of the European Monetary System was one facet of the long-term plan leading to the establishment of a monetary union and with it the coordination of economic and monetary policy across the continent. However, the Exchange Rate Mechanism proved to have mixed success in the subsequent decades following the collapse of the Bretton Woods system. In 1992, Europe witnessed a massive exchange rate crisis and dramatic shock to the ERM. Exchange rates fluctuated wildly and portended a failure of the Exchange Rate Mechanism and the European Monetary System. Although the system did not ultimately collapse completely, its credibility was severely shaken. The crisis was the result of a severe loss of credibility in the ERM system that was produced by a lack of policy coordination following the reunification of Germany. The purpose of this paper is to explain these factors that contributed to the exchange rate instability that caused the crisis in 1992. This will be accomplished by first reviewing the existing literature on the theory of exchange rate target zones in an ideal state and during an exchange rate crisis, and then proving that the evidence suggests that the failure of the system was the result of a loss of credibility in the system promulgated by a lack of policy coordination.

 Before a discussion of the theory, a brief account of the historical background will provide a contextual framework to consider the following analysis. Following the collapse of the Bretton Woods monetary system in 1972, a European committee under the direction of Pierre Werner, the Prime Minister of Luxembourg, negotiated a planned integration of the European economies through a monetary union. Although the first attempt failed on account of the oil shocks of the 1970s, a second attempt was initiated by the French President Giscard d’Estaing and the German Chancellor Helmut Schmidt in 1979 to establish the European Monetary System with similar motivations. A key feature of the EMS was the Exchange Rate Mechanism, which fixed member countries’ exchange rates to a band of +/- 2.25% relative to each other country’s respective currency. This network of bilateral rates was to be maintained within these pegs by domestic central banks until a point of further development and integration that a single European central bank could dictate European monetary policy. Within this fixed exchange rate regime, countries were permitted to realign their pegs upon approval by all EMS member countries (Palm 1996).

 The irony of the conception and implementation of target zones in the Exchange Rate Mechanism is that no established theory regarding the functioning of such target zones existed prior to its implementation. The unsubstantiated intuition behind fixed exchange rate target zones was that the exchange rates would function as if floating between the two bands. Once the exchange rate exceeded the limits of the bands, governments would intervene to maintain the upper or lower limit, namely through monetary policy. If the exchange rate exceeded the upper limit then monetary contraction would be pursued to appreciate the domestic currency relative to the foreign currency. If the exchange rate droped below the lower limit, monetary expansion would be pursued to depreciate the domestic currency against the foreign currency. It was not until Krugman (1991) published a paper providing a theoretical foundation for the behavior of exchange rates within target zones that this naïve intuition was proven inaccurate and proper academic discourse was initiated.

 Krugman (1991) proposed a “minimalist monetary model” of exchange rates constrained within two bands of a target zone. Krugman argues that contrary to the naïve intuition of exchange rate behavior discussed above, these two bands actually constrain expectations of the exchange rate such that as the exchange rate approaches the limits of the bands, it is expected that governments will intervene to prevent the exchange rates from exceeding the bands. Krugman models this behavior with the following equation:

1. s = m + v + γE[ds]/dt,

where s is defined as the log of the spot price of foreign exchange, m is money supply, v is a variable for velocity shocks, and the final term is defined as the expected rate of depreciation. The money supply variable, m, is assumed to be fixed and is only adjusted by monetary policy to maintain exchange rates within the band. Furthermore, v is assumed to follow a random walk within this simple model. This simple model can be utilized to disprove the naïve view of floating exchange rates between bands in favor of Krugman’s proposed theory of constrained expectations.

 According to Krugman, in the naïve view, with constant m and randomly varying v, expected depreciation is equal to zero, so s = m + v in an essentially floating exchange rate within the target zone, which is depicted in graphical form in Appendix 1. However, Krugman argues that the exchange rate is “dragged down” by the expected depreciation term as the exchange rate approaches the bands because governments are expected to intervene by adjusting the money supply accordingly to maintain the credibility of the target zone; exchange rates will never exceed the fixed pegs. This produces an S-curve graphically depicted in Appendix 2. The S-curve is tangent to the target zone pegs because exchange rates would never be expected to exceed the limits without government intervention adjusting the money supply – a shift of the S-curve along the x-axis – to make credible government commitments to maintaining the target zone. Credibility is a key assumption in this model because if governments lack credibility to maintain exchange rates then the curve loses its shape and resumes an expectation of a floating rate model.

 Krugman’s model was simple and general in nature, and as such failed to consider a number of relevant variables. Bertola and Caballero (1992) expanded on Krugman’s model to include the expectations of realignment, a key feature and viable policy option under the Exchange Rate Mechanism. They argue that frequent realignments have more explanatory power in determining the behavior of exchange rates within the bands of the ERM. They contribute to the model a variable for expectations of realignment weighted by p, the probability of realignment when the exchange rate is at the margins of the bands. As the probability of realignment increases above 1/2, the S-curve inverts as expectations of realignment up or down increase at the limits of the bands. With this adjustment to Krugman’s model, Bertola and Caballero established a model of imperfectly credible exchange rate pegs, but it nonetheless relatively accurately described exchange rate behavior in the ERM until the late 1980s.

 In order to explain the crisis in 1992 of the ERM, one more crucial condition of imperfect credibility of the ERM system has to be explored. Buiter, Corsetti, and Pesenti (1998) employ the theory of a currency crisis to model the imperfectly credible commitment to exchange rates. This condition holds because countries always have the policy option of abandoning the exchange rate pegs when the costs of maintaining the pegs following external shocks exceed the benefits. Their theory contends that an exchange rate crisis is an optimal solution under these conditions. According to their theory, a “shadow devaluation rate” – Δ$\tilde{s}$I – exists that equals the percentage change in the exchange rate when a devaluation is pursued by policymakers. This rate is also equal to the observed rate of depreciation in a realignment in a situation in which policymakers defend the bands of the peg, which follows the model of Bertola and Caballero. The depreciated exchange rate and the devalued exchange rate in realigned bands reflect the two policy decisions that can be pursued under extreme external shocks. The decision to depreciate or devalue and realign depends on the “shadow devaluation rate” which is a function of fundamentals modelled as:

(2) Δ$\tilde{s}$i = Awi + Boi + Cvi – p\*

where w equals the log of the domestic wage level, o indicates an index of domestic policy goals like price or unemployment targets, p\* is the price level of the center country in the exchange rate regime, and v is a variable for external shocks. It is evident from this model that higher wage-inflation rates (high w) and overambitious policy goals (high o) lead to higher Δ$\tilde{s}$i. This value changes based on the policy preferences of each respective country and contributes to the tension of the ERM, particularly when hit with external shocks. The exchange rate crisis option will be chosen if Δ$\tilde{s}$i exceeds the reputational and political costs of a devaluation.

 Despite the apparent convergence of many macroeconomic variables and national policies during the 1980s, the period before the crash of 1992 revealed that there still remained fundamental policy divergences that were manifested after a series of key political developments, namely the reunification of Germany. The reason that the reunification of Germany shook the ERM was that the German Deutsche Mark and the Deutsche Bundesbank were the “anchor” of the ERM and EMS because of their sound macroeconomic conditions, namely their low inflation and interest rates which maintained monetary stability (Palm 1996). All other periphery countries in the EMS fixed their exchange rates to the Deutsche Mark in 1983. This system worked effectively and achieved relative economic convergence and policy coordination for the first several years. No parity realignments were pursued after 1987, and it seemed as though the process of developing into a European monetary union was on track while anchored with Germany’s monetary stability. However, the reunification of West and East Germany in 1990 tested the system through a demand shock to the relatively stable German currency after Germany pursued an expansionary fiscal policy to accommodate the relatively underdeveloped East Germany (Svensson 1994).

 The demand shock dramatically impacted Germany at the center of the ERM and resulted in a real appreciation of the Deutsche Mark. Germany had two possible responses to this real appreciation: pursue a monetary expansion to absorb the shock and maintain lower interest rates, or pursue a general realignment revaluation against the peg. The option to pursue a monetary expansion was unattractive to Germany because it would lead to higher inflation, and Germany sought price stability as a policy goal. To the peripheral countries’ detriment, the Deutsche Bundesbank advocated for a general realignment to accommodate for its currency appreciation (Buiter et al 1998). However, this realignment would have required all peripheral countries to devalue their currencies against the Deutsche Mark, which was an unpopular option considering many countries leading up to that moment were experiencing strong currency appreciations against the Deutsche Mark (Svensson 1994). Devaluation also carried additional political and credibility costs on countries and the ERM system, making it an unpopular policy option.

 The negative effects of the policy that the dominant Germany imposed on the system were compounded by the divergent national monetary and fiscal policies of the peripheral countries and the nature of international spillovers fundamental to the system. No country’s unilateral monetary policy existed in a vacuum, but they had relative appreciation/depreciation effects on the center country (Germany). The effect on the German Deutsche Mark was then transmitted throughout the rest of the system, further requiring individual countries to pursue independent policy options in response (Buiter et al 1998). Considering each country had their own policy preferences reflecting independent preferences for underlying macroeconomic conditions, the ERM was under significant tension even before an asymmetric demand shock afflicted the central, dominant country in the system. Buiter, Corsetti, and Presenti (1998) contend that a key problem that led to compounded effects of the 1992 crisis was the subsequent policy-coordination failure between Germany and the peripheral countries, as well as the peripheral countries amongst each other. This lack of policy coordination challenged the credibility of the system, a feature that was assumed in the theoretical exchange rate behavior models of Krugman and Bertola and Caballero.

To further explain the collapse of the system, one must consider expectations of devaluations that remained stable prior to 1992, contributed to a credible exchange rate system, and did not portend the collapse in 1992. Buiter, Corsetti, and Presenti (1998) argue that a sudden shock to expectations was driven by the realignment of the Italian lira following a 7% devaluation. However, this realignment was pursued unilaterally, which shifted expectations of the remaining peripheral countries who no longer could rely on coordinated policy action throughout the system. This shock to expectations contributed to a series of speculative attacks on currencies that led several to devalue or abandon the peg as countries independently sought cost-minimizing policy consistent with their domestic economic conditions. By the time of the widespread collapse of the ERM, the credibility of the system had been lost.

The reasons for the dramatic devaluations or depreciation and abandonment of the peg vary by country, but they often reflected the macroeconomic conditions of the country’s domestic economy. For example, the UK, burdened by high unemployment, chose to abandon the peg amidst the collapse of the ERM following speculative attacks that depreciated its currency. A general revaluation of the German currency in the ERM restricted the UK’s policy options and would lead to recession and higher unemployment until prices adjusted. High unemployment suggests that a government might abandon the peg and switch to a floating exchange rate, and the market anticipation of this phenomenon would lead to an immediate speculative attack, which is what was experienced by the UK in 1992. Knot, Sturm, and de Haan suggest that these divergent unemployment rates as well as account balances, inflation, and fiscal policies – which resulted in budget deficits in some countries – threatened the credibility of the ERM system on a broader scale. After empirically testing panel data for six ERM currencies, they concluded a statistically significant relationship between these underlying macroeconomic fundamentals and the speculative attacks on currencies during the 1992 crisis. Another variable that they determined was relevant in explaining the credibility of the system was the stock of foreign reserves. Central banks with higher quantities of foreign reserves were capable of credibly committing to defending the peg. The differences in these macroeconomic conditions and the diverging policy preferences for each country only served to intensify the collapse of the ERM in 1992.

The effects of the collapse were dramatic across the continent. Multiple currencies exceeded the limits of their pegs on a number of occasions, forcing countries to either devalue or abandon the peg. On September 8 the Finnish markka was forced to float. The Italian lira – although the net 7% devaluation against Germany was negotiated that same day – was eventually also forced to abandon the peg after again reaching its exchange rate limit on September 16 (Svensson 1994). As discussed earlier, the United Kingdom was under severe pressure from their unemployment level, and the British pound was forced to float on September 16, only after the Bank of England depleted approximately half its stock of foreign reserves valued at 15 billion dollars (Buiter et al 1998). In Spain, a devaluation of 5% was initially pursued. Some countries like Sweden and Ireland did initially commit to maintaining their exchange rates, but this policy decision came at the price of raising the overnight marginal lending rate to 500% in Sweden, and 300% in Ireland. Still, this did not secure the Swedish krona from a second speculative attack in November forcing it to float after the Riksbank lost 25 billion dollars in foreign reserves. The Irish punt eventually suffered a similar fate. The Spanish peseta was initially devalued 6%, followed by a second devaluation in 1993 of an additional 8%. The Portuguese escudo was also initially devalued at 6% followed by a 6.5% devaluation in 1993 as speculative attacks resumed. By the conclusion of the crisis, eleven countries’ currencies had been attacked, and all were floated or devalued except the Belgian franc, the French franc, and the Danish krone (Svensson 1994). The underlying macroeconomic fundamentals and diverging national policy preferences predicted the path pursued by each country, and the cascading nature of the crisis lends evidence to the international spillovers described by Buiter, Corsetti, and Pesenti (1998).

The key to understanding the exchange rate crises of 1992-1993 is the lack of credibility in the ERM system that was sustained through the diverging macroeconomic fundamentals and national policy preferences. The ideal model of exchange rate behavior within target zones proposed by Krugman assumed credible commitments to defending the exchange rate. With the contribution of the policy option of realignment proposed by Bertola and Caballero, the model relatively accurately reflected the ERM system throughout the 1970s-1980s. This suggests that the ERM countries had relatively credible commitments to the system throughout this period, and this produced relative stability and economic convergence. However, the credibility of the ERM system was shattered during the 1992 crisis. Without credibility, the model proposed by Krugman lost its stylized S-curve and fell apart under the subsequent speculative attacks that swept through the ERM members. The failure of the system reflected the diverging national policy preferences that were only revealed following the dramatic demand shock caused by German reunification. The lack of policy coordination abolished credibility in the system, and policymakers were forced to make optimal cost-minimizing decisions that reflected their domestic countries’ respective macroeconomic fundamentals and policy preferences. By the time the collapse concluded, the credibility of the Exchange Rate Mechanism was disastrously undermined. In the immediate aftermath the exchange rate pegs were expanded to +/- 15%, but credibility of the system was already lost and a new path to European monetary union had to be pursued.

Appendix 1



Krugman (1991)

Appendix 2



Krugman (1991)

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