German Monetary Union, the Bundesbank and the EMS Collapse

CARSTEN HEFEKER

1. Introduction

The recent collapse of the European Monetary System (EMS) marks a setback in the movement towards European Monetary Union (EMU). The decision to adopt a 30% corridor around the bilateral target rate constitutes a step backwards on the way towards the full monetary union envisaged in the Maastricht treaty. Following a five-year period without realignments up to September 1992, with the removal of capital controls and with new entrants into the Exchange Rate Mechanism (ERM), the question arises as to how this sudden shift can be explained.

The literature on this question identifies two major causes for the occurrence of the September 1992 crisis and the collapse of the EMS on August 2, 1993.[1] One explanation identifies the large idiosyncratic shock of German unification (Portes 1993). Here the "inconsistent trio" of stable exchange rates, independent monetary policy and free capital movements caused the collapse of the EMS, as the

□ University of Konstanz, Faculty of Economics and Statistics, Konstanz, Germany.

* I would like to thank Hans Peter Grüner, Gian Cesare Romagnoli, Heinrich Ursprung, Roland Vaubel, and two referees for very helpful comments. Financial support from the Deutsche Forschungsgemeinschaft through the SFB 178 is gratefully acknowledged.

[1] For a survey of the literature see Svensson 1994. Throughout this paper I interpret the widening of the bands of the ERM as the collapse of the EMS although it is not officially resolved. The ERM is, among the ECU and credit provisions, only part of the EMS. Moreover, the Greek drachma was not included in the ERM. See Fratianni and von Hagen (1992) for details.

Bundesbank had to tighten monetary policy in reaction to excessive German government spending following unification, while the other EMS countries were unwilling to follow in tightening money supply or to devalue. Another interpretation stresses the role of the Maastricht treaty in this context. Eichengreen and Wyplosz (1993) view the treaty as inducing rational balance of payments crises, causing the collapse. A speculative attack forcing a devaluation prevents a country from satisfying the non-devaluation requirement two years prior to EMU of the Maastricht treaty. The country, once driven out of the EMS, no longer qualifies for EMU membership and has no incentive to continue a restrictive monetary policy. A speculative crisis could thus prove self-fulfilling.

Overall, the literature assigns only a passive role to the Bundesbank. I instead focus on the active role of the Bundesbank in the collapse of the EMS and suggest that the Bundesbank's self-interests might have been decisive for the collapse of the EMS. In this interpretation, the Bundesbank's behavior was caused by German Monetary Union (GMU) in combination with the Maastricht treaty.

First, I argue that the chosen exchange rate between Deutsche Mark (DM) and Ost Mark in the course of German unification marked the starting point of a conflict between the German government and the Bundesbank. The Bundesbank had to accept a different rate of conversion than it had proposed and suffered a major loss in its reputation as an independent central bank *vis-à-vis* the German public and the EMS partners (see Marsh 1992). Expansionary fiscal policy adopted by the government only aggravated this conflict, being countered by tight monetary policy. Given the dominant role of the Bundesbank in the EMS and the constraints for independent monetary policy in the ERM, the tight German monetary policy spilled over into other ERM countries, forcing them to tighten monetary policy as well. While the European countries first profited from the export boom caused by German unification, with the recession the European governments were no longer able to defend the exchange rate by raising interest rates.

The second reason for the EMS collapse can be seen in the Maastricht treaty itself. The treaty is often interpreted as stemming from German unification and signaling German commitment to the European unification process (Garrett 1993; Sandholtz 1993). By accepting a specific date for monetary union, Germany surrenders monetary autonomy as the price for European, and especially French,

approval to German unification. I argue instead that the treaty, by fixing the date when the Bundesbank would lose independence, and thus its leading role in Europe, prompted the Bundesbank to set monetary policy even tighter than it might have done otherwise. A relatively restrictive policy was regarded as a way of stopping movement towards EMU as growing domestic political pressures in the partner countries signaled that the other countries might no longer be able to defend their exchange rate against the DM. The effects of GMU, in this perspective, only gave the Bundesbank a reason to block EMU after the Maastricht treaty had been signed. Thus, the treaty, seen as a German commitment to European unification, actually triggered the shattering of EMU.

The paper proceeds as follows. In Section 2, the GMU shock and the resulting conflict between the German government and the Bundesbank are described. In Section 3, the external dimension of GMU and the EMS crisis are addressed. Section 4 presents a model on the above considerations and the final section offers concluding comments.

2. The end of monetary consensus policy in Germany

After World War II there was a nearly unanimous consensus in Germany that stable and positive growth required a stable monetary policy. Although there were minor conflicts between the Bundesbank and the government concerning the daily course of monetary policy (see Marsh 1992), the Bundesbank had always been careful not to push the conflict too hard out of fear of losing its independence which was only granted by simple law (Hartwig 1984; Goodman 1992). In its position *vis-à-vis* the government, nevertheless, the Bundesbank could always count on public support, also restricting the government's possible actions.[2] The Bundesbank as a bureaucratic institution fol-

[2] Vaubel (1993a) argues that the Bundesbank mainly targeted public support and hence also bowed to political pressure when it feared losing public support for its policy. Empirical evidence for this argument can be found in Frey and Schneider (1981). Goodman (1992) argues along the same lines and cites events when the Bundesbank eased monetary policy, as well as those when it preferred to demonstrate its independence and undermined the government's policy (see also Hartwig 1984 and Marsh 1992). This is the reason for taking the employment aim into the objective function of the formally independent Bundesbank.

lowed its own aims, demonstrating its independence when possible but taking into account the government's threat to remove independence when conflicts became too severe (see Havrilesky 1994 for a survey of the literature on central bank behavior). This non-conflictual relationship changed drastically with German unification and GMU.

With the fall of the Berlin Wall in 1989, a lively discussion started among economists about the right form of economic integration for the united Germany. Considerations of East German competitiveness encouraged economists to propose an exchange rate between the DM and the Ost Mark of between two and five Ost Mark per DM (see *e.g.* Siebert 1991). The Bundesbank, more concerned with the conversion of the money stocks, instead proposed a rate of conversion of 2:1 (Bofinger 1991). The final decision of the German government, which is the exchange rate authority in Germany, however, was a political choice, obviously caused by election motives and an attempt to restrict migration from the East to the West. The first general elections for the united Germany were set for December 1990 and it thus seemed safer to show generous behavior *vis-à-vis* the new citizens. Hence, most private stocks were converted 1:1 upon GMU in July 1990, resulting in an overall weighted average between 1.8:1 and 1.6:1.[3]

Not only the rate of conversion, but also, and more drastically, the subsequent change in the fiscal policy were caused by re-election motives of the German government. While the rapidly rising wages in East Germany caused a major wave of unemployment, the government was concerned with winning the next elections. For this reason, a tremendous program of public spending was launched (see Kröger and Teutemann 1992). Consequently, the budget deficit soared as increased spending was mainly financed by public debt instead of tax revenue. Deficit spending resulted in increased pressure on the price level, aggravated by the post-unification boom in West Germany and the continuously rising wages in both parts of the country beyond increases in productivity (Franz *et al.* 1993). Consequently, the Bundesbank recurrently warned that the loosening of fiscal policy might create a severe danger for the stability of the DM (see *e.g.* Bundesbank 1991).

[3] Most of the literature refers to a rate of 1.8:1. This, however, overlooks a special item in the balance of the GDR banking system which was not converted. See Bofinger (1991) for details.

Thus, partly justified by real problems of information uncertainty concerning money demand in the new federal states (see von Hagen 1992), and caused by the inflationary pressure from fiscal spending, the Bundesbank reacted extremely cautiously although the actual rate of conversion came very near to what it had proposed. The true reasons for tightening money supply were due to the fact that the Bundesbank felt publicly humiliated by the government.[4] While officially the question of the correct exchange rate was still under discussion, the German Chancellor announced his decision on the exchange rate without informing Bundesbank president Karl-Otto Pöhl, although they had met only a few hours before. This public neglect of the Bundesbank's intentions and fears upset the Bundesbank, causing it to demonstrate its determination to defend the value of the DM and to compensate for lost prestige in Germany.[5]

Moreover, the German government embarked on the Maastricht process, generally viewed as a German commitment to European unification (Sandholtz 1993; Garrett 1993). The Bundesbank, however, interpreted this as an attempt to trade its autonomy for political aims (Marsh 1992, p. 326). As the treaty provided that monetary union was to begin by 1999 at the latest, the Bundesbank saw its stabilization successes and its independence threatened. The Maastricht treaty of December 1991 therefore provided it with yet one more reason to tighten monetary policy. Being the leader of the EMS central banks, the Bundesbank had to defend its international reputation and the "anchor" role of the DM to which it often referred, stressing the importance of keeping this position especially after GMU (see, for example, Bundesbank, *Auszüge aus Presseartikeln*, June 11, 1993). Moreover, the Bundesbank constantly expressed its reservations concerning the EMU. It claimed to need independence to continue its stable monetary policy and voiced its fear of being undermined by less stability-oriented countries in a common monetary authority (Marsh 1992). EMU could only be a deterioration for the Bundesbank which,

[4] This reasoning is in contrast to the model of Canzoneri and Diba (1991). They argue that a central bank will increase money supply, following the Ramsey-Phelps-rule, when the government increases fiscal spending. The difference, of course, is due to the welfare-maximizing central bank in their model.

[5] Marsh (1992, chap. 8) describes in detail how the Bundesbank members expressed their feeling of humiliation and voiced publicly their criticisms of the government's disregard of the Bundesbank's autonomy.

therefore, was not interested in losing its independence (Vaubel 1993b). While the Delors Report had advanced the idea of monetary union in some distant future as a rather theoretical construction, the Maastricht treaty changed this situation overnight. Now the Bundesbank could see that it would lose independence by January 1999 at the latest.[6] With the fixed date visible, the Bundesbank embarked on a course of defending its independence by obstructing this process. Only one week after the Maastricht meeting, it started to raise its interest rates, thereby trying to make it more difficult for other countries to follow and fulfil the criteria of the treaty, and thus delaying monetary union (Vaubel 1993b). Hence, not only was monetary tightness seen as a way to rebuild lost reputation and heal the public humiliation in Germany, it also constituted a possibility to hinder the Maastricht process by using the inflationary effects of fiscal expansion as a reason for this policy. A major recession was already visible on the European horizon; it was only a matter of time until the other EMS countries would have to surrender their interest-rate policy to internal political pressure.

3. The collapse of the EMS

Following the real shock of the German unification, almost all observers were certain that the DM needed to revalue to attract the necessary capital and to cause the external deficit needed to rebuild East Germany (Portes 1993).[7] Thus, the Bundesbank proposed a general realignment of the EMS which, in its perspective, would have also helped to reduce the pressure on the price level in Germany as a larger part of the demand shock would be shifted onto its European partners. In contrast, the EMS countries were not interested in a realignment, because this, at least for the "weak-currency" countries, would result in an increased risk premium on interest rates (Bofinger 1991). France was especially unwilling to devalue its currency against

[6] The Bundesbank members have stressed several times that there should not be a fixed timetable for monetary union but that it should be dependent on economic criteria and convergence among member states (see *e.g.* Bundesbank, *Auszüge aus Presseartikeln*, September 6, 1990).

[7] In the long run, the DM will of course have to depreciate because the external financing of the integration of East Germany will have to be paid off. The necessary current account surplus will require a depreciated DM (Melitz 1991; Wyplosz 1991).

the DM. It wanted to receive the benefits of a low inflation rate and also the prestige from having a more stable currency than Germany, hoping gradually to become the new "anchor" of the system (see *The Economist*, June 26, 1993, p. 90). Hence, a devaluation against the DM was ruled out. The Bundesbank, in turn, did not want to allow real appreciation to come about by German inflation (Portes 1993). This implied deflation for the other countries as Germany's price level had to rise relatively to the rest of the EMS.

While the spillover effects of the interest rate increase hit the partner countries hard, forcing them to raise interest rates to defend their currencies against the DM, Germany initially also worked as a locomotive for their exports. The EC countries started to export their excess production to Germany. Accordingly, the German current account surplus from 1989 turned into a deficit in 1991. Several countries even spurred their exports to Germany on a two-digit basis.[8]

This positive effect, however, eventually paled in the aggravating European recession. Markets finally no longer expected politicians in ERM countries to be able to defend the exchange rate for domestic reasons. Growing rates of unemployment thus severely undermined the credibility of the EMS commitment (De Grauwe 1994). The rejection of the Maastricht treaty in the Danish referendum in June 1992 finally triggered the first crisis, raising expectations among speculators that the monetary union would be delayed beyond the date set by the Maastricht treaty (Eichengreen and Wyplosz 1993).[9] Speculations against the weaker currencies of the EMS followed immediately. The pressure increased with the approaching French referendum. Despite intervention, the Italian lira and the British pound left the ERM and the Spanish peseta and the Portuguese escudo devalued.[10] In the spring of 1993, the recession spread from

[8] It is a disputed issue whether the overall effect from German unification for the partner countries was positive or negative. While some studies suggest that the adverse interest rate effects were larger (Hughes Hallett and Ma 1993), others reject this finding and come to the opposite conclusion that the export boom had a larger positive effect (Franz *et al.* 1993).

[9] Both crises are described in detail by Eichengreen (1993) and Svensson (1994).

[10] Although the Bundesbank offered to lower its interests rates when the lira devalued, it did so only marginally after the lira's devaluation which only confirmed markets that more devaluations could be expected (*The Economist*, September 19, 1992, p. 16) because it signaled the Bundesbank's unwillingness to defend the weaker currencies (Eichengreen and Wyplosz 1993). Market speculation, thus, also forced the pound out of the EMS and a devaluation of the peseta and the escudo.

the US and the UK towards continental Europe, gathering force and initiating the second crisis. Although France expressed its determination to defend the franc, gloomy reports on the French economy triggered pressure on the franc in July. Although observers were convinced that a 1% lowering of the German interest rates was necessary to release pressure on the franc to make it politically possible for France to remain in the ERM, the Bundesbank declined to do so (Eichengreen 1993; Svensson 1994), thereby utilizing its chance to put other EMS countries under pressure.[11] Massive intervention ensued, and by the end of July the Bank of France had run down its reserves, while those of the Bundesbank rose by nearly DM 40 billion. This increase, allegedly posing a danger to the money supply in Germany, was used by the Bundesbank as an argument not to intervene further (Vaubel 1993b). The first weekend in August then saw the historical meeting of European finance ministers and central bankers, which brought the widening of the exchange rate bands to $\pm$ 15%.

The developments after the collapse could be interpreted as a proof that the speculation, at least against the franc, had not been justified. The Banque de France did not lower its interest rates and remained more or less in the tight corridor to the DM. Another interpretation for the stable relations after the collapse, however, might be the Bundesbank's reaction. On August 3 it cut its repurchase rate, followed by another cut the day after, citing as a reason its aim to calm the foreign exchange markets. It also announced that it would use all scope to further cut interest rates (*The Economist*, August 7, 1993, p. 22). One might also conclude, however, that after having forced out the EMS currencies and having shattered the ERM the Bundesbank used its space to relax German monetary policy and to reduce the interest rate gaps. There was no longer need to be overly restrictive in setting monetary policy.

[11] Although the repurchasing and the lombard rate were cut, this was regarded as inadequate (Eichengreen 1993).

4. A model of EMS crises

In this section, a simple model is presented to analyze the policies of the relevant actors leading to the collapse of the EMS. I use a game-theoretical model with imperfect information which is solved by backward induction to describe the behavior of the actors. First, the basic structure of the model is developed.

The German government *G*, as represented by the fiscal authority, is concerned with inflation and output. Given its politically determined short-time horizon as elections approach, it is predominantly concerned with output because higher output enhances the chances of re-election. Increasing government expenditure would expand output, while the inflationary effect is only felt after a certain time-lag. The central bank *B* in contrast has a longer time-horizon. Given its function as "protector of the currency", it is primarily concerned with monetary stability, placing less weight on the output target than the government. The employees of the central bank derive their prestige and utility by keeping the price level stable. Price stability, which gives the assurance of having performed well, is their most important goal (Andersen and Schneider 1986).

The German government's objective function is given by

$$U_G = -[\alpha(y - \bar{y})^2 + \beta\pi^2] + \lambda D \,, \tag{1}$$

with

$$y = \alpha_1 g + \alpha_2 m - \eta \,, \tag{2}$$

and

$$\pi = b_1 g + b_2 m \,, \tag{3}$$

where utility is a negative function of deviations from the target employment level $\bar{y}$ and also a negative function of inflation π (the preferred rate of which is zero).[12] To this standard formulation of the government's objective function I add λD, which is a weighted

[12] Note that the assumed preferred rate of zero inflation for the government excludes the motive to reduce real government debt via inflation. The same assumption is made for the foreign government. Hence, I assume a European stability consensus where zero inflation is preferred by all governments but has to be traded off against the employment objective.

dummy for EMS membership, signifying the desire to achieve European integration and to signal Germany's commitment to it. D is one for the Maastricht treaty and zero before. In this short-term model, employment in the united Germany is a positive function of government spending g and the money supply m and negatively affected by the external shock of German unification η. All parameters are positive. It is assumed that government spending has a stronger impact on employment than on inflation, while the opposite is true for money supply.

The Bundesbank's objective function is given by

$$U_B = -[\gamma(y - \bar{y})^2 + \delta\pi^2] - \mu D \ . \tag{4}$$

In comparison with the government, the Bundesbank places more value on the inflation aim and less on the employment aim. The second source of conflict is constituted by the negative value of the Maastricht treaty here because the Bundesbank's utility is not only dependent on stable prices but also on independence. Monetary union would instead endanger the possibility to set the most preferred rate of money supply and thus undermine the prestige derived from low inflation. Even a low European rate of inflation would no longer be attributed to the Bundesbank, while in the pre-Maastricht EMS the Bundesbank was viewed as exerting a disciplinary pressure on other countries. All these effects are captured by the dummy D, which is one for the envisaged loss of independence by monetary union and zero before the Maastricht treaty.

A. *The government and the Bundesbank before GMU*

Before the shock of German economic and monetary union, the German government and the Bundesbank set their respective policies cooperatively. In contrast to similar models where authorities act cooperatively because of the Pareto-efficiency (Andersen and Schneider 1986), the reason here for both to play cooperatively is found in the objectives of both. Each chooses a cooperative solution because the game is repeated. Although the German government has an incentive to renege on the agreement, given its short time-horizon, it is also aware that the Bundesbank receives a high rate of approval

by the German public. Given this stability consensus, as described in Section 2, the government does not risk a confrontation with the Bundesbank in normal times, that is without the shock η. The Bundesbank, in turn, has no incentive to renege on the agreement because it cannot risk too strong a conflict with the government, fearing the loss of independence which is granted only by simple law (Goodman 1992). Moreover, given the government's consideration of the stability consensus, the Bundesbank can perform well enough in a cooperative game without confronting the government and the risk of losing independence.

Before the external shock of German unification ($\eta = 0$) and the Maastricht treaty ($D = 0$), it is thus assumed that the German government and the Bundesbank cooperate and maximize a common objective function because the major sources of conflict are absent. Their common objective function is a weighted average of both individual objective functions:

$$U_{GB} = \Theta U_G + (1 - \Theta)\, U_B \ . \tag{5}$$

The actual outcome of the joint maximization is determined by the relative bargaining power of the authorities as portrayed by the weights Θ and $(1 - \Theta)$. Using equations (2) and (3) in (1) and (4) and combining them in (5) gives the optimal cooperative choice of the instruments as

$$g_c = \bar{y}\left[\frac{b_2\,(b_2\,a_1 - b_1\,a_2)}{(b_2\,a_1 + b_1\,a_2)^2 - \tau}\right], \tag{6}$$

and

$$m_c = \bar{y}\left[\frac{b_1\,(b_1\,a_2 - b_2\,a_1)}{(b_1\,a_2 + b_2\,a_1)^2 - \tau}\right], \tag{7}$$

with $$\tau = 2a_1a_2b_1b_2 \ .$$

The index c refers to the cooperative setting of the instrument where, dependent on the bargaining power of either authority, looser or tighter government spending and money supply are chosen.

B. *The foreign authority*

The foreign EMS country, denoted by asterisks, is assumed to profit from the Maastricht treaty. The treaty provides a way to increase the credibility of stability-oriented monetary policy, and on the other hand to gain influence on the setting of European monetary policy. This, for reasons of reputation, might be especially important for France (De Grauwe 1993). The foreign EMS country's objective function is therefore given by

$$U^* = -\left[\alpha^*(y^* - \overline{y^*})^2 + \beta^*\pi^{*2}\right] + \lambda^* D \,, \tag{8}$$

where the dummy captures the value of being in the EMS. The relative weight λ^* placed on the dummy is allowed to vary between countries to reflect diverging preferences of different EMS countries regarding EMS membership. The monetary and fiscal instruments, for simplicity, are assumed to have the same relative impact on employment and inflation as in the German case. It is assumed that in the foreign country only one authority, the fiscal authority as a government agency, decides over both instruments so that no conflict between central bank and fiscal authority arises. This assumption still reflects the institutional facts in most of the EMS countries, where most of the central banks have not yet received political independence, although the Maastricht treaty requires independence for all central banks.

In the case of the European recession, the negative external shock ξ, the foreign government may choose to leave the EMS, in which case

$$y^* = a_1 g^* + a_2 m^* - \xi \tag{9}$$

and

$$\pi^* = b_1 g^* + b_2 m^* \tag{10}$$

are domestically determined. This allows the stabilization of output and employment by increasing the money supply, hence maximizing government utility according to preferences. The costs, however, are increased inflation and an EMS dummy of zero value.

If EMS membership is valued positively, to qualify for EMU and secure an influence on European monetary policy later, there is an incentive to stay in the EMS. Then, however, monetary policy cannot be independently set. The foreign money supply is tied by $m^* = \varphi m$ to the German money supply, where φ describes the tightness of the exchange rate constraint, *i.e.* the width of the corridor. If φ is equal to one, the foreign money supply is tied completely to the German one, leaving no discretion. With $\varphi > 1$ some discretion is given for the foreign authority. Consequently

$$y^* = a_1 g^* + a_2 \varphi m - \xi \tag{9'}$$

and

$$\pi^* = b_1 g^* + b_2 \varphi m \tag{10'}$$

illustrate the EMS case.

To keep the analysis simple, it is assumed that when the negative external shock for the foreign country ξ is zero, the EMS solution will always be chosen because reneging bears credibility costs for the government. This implies that the relative weight λ^* of the EMS dummy is high enough to compensate for lost autonomy. When the shock occurs, however, the foreign authority has to decide whether to choose m^* independently and to stabilize output by increasing the money supply or to stay in the EMS and adopt the Bundesbank's monetary policy φm. For the simplicity of the analysis, I set g^* constant for both cases so that the foreign authority's decision depends solely on the money supply. This may reflect a certain institutional constraint which, for example, requires the level of government spending not to surpass a certain value, the slow working of the budgetary process, or an external borrowing constraint.

The foreign authority's decision will of course depend on which choice yields higher utility. The decision problem is consequently

$$\max U^*_{m^*}(\xi) = \begin{cases} -[\alpha^*(y^* - \overline{y^*})^2 + \beta^*\pi^{*2}], & \text{for } m^* > \varphi m \\ -[\alpha^*(y^* - \overline{y^*})^2 + \beta^*\pi^{*2}] + \lambda^* D, & \text{for } m^* = \varphi m \end{cases} \tag{11}$$

The difference in both utilities for setting money supply under the EMS constraint or independently is now evaluated for the case of the shock. First, the optimal value of money supply for the uncon-

strained case is calculated by using equations (8), (9), (10) and differentiating $U^*(\xi)$ with respect to m^*. This yields an optimal money supply of

$$\tilde{m}^*(\xi) = \frac{\alpha^* a_2(\xi + \overline{y^*}) - g^*(\alpha^* a_2 a_1 + \beta^* b_2 b_1)}{\upsilon^*}, \tag{12}$$

where $\upsilon^* = \alpha^* a_2^2 + \beta^* b_2^2$.

The tilde characterizes the optimal unconstrained value of the instrument in case of a shock. Whether utility is higher when staying in the EMS or when leaving it is, of course, dependent on the German money supply which determines the difference between $\tilde{m}^*$ and φm. Comparing utility levels for $\tilde{m}^*$ and φm by using equation (11) results in the following. The foreign authority will opt for $\tilde{m}^*$ and leave the EMS if

$$\tilde{m}^*(\xi) > \varphi m - \left(\frac{\lambda^*}{\upsilon^*}\right)^{1/2}. \tag{13}$$

Note that both the value placed on the EMS membership λ^* and the width of the exchange rate band φ play an important role in the decision of the foreign government. Different values of λ^* for individual countries capture different attitudes towards EMS membership and the importance placed upon it. Only when the difference between the adequate money supply to counter the negative shock and the money supply tied to the Bundesbank is sufficiently large, will the foreign country opt out.

C. *The Bundesbank*

When the German government reneges on the implicit contract with the Bundesbank, the Bank no longer sets its money supply cooperatively. It now has the chance to optimize its utility function without restriction, because the Maastricht treaty, while implying the loss of independence by 1999, requires also all countries to grant independence to their central banks before entering EMU. This requirement widens the range of possible actions for the Bundesbank as it takes away the threat of losing independence when confronting the government. Moreover, the problems of monetary control

stemming from German monetary union (see von Hagen 1992) give an excuse to be overly restrictive. Finally, the Bundesbank can count on increasing public refusal of the Maastricht treaty given increasing rates of employment (Marsh 1992).

By using equations (2), (3) and (4), the unconstrained optimization of its objective function yields

$$\tilde{m} = \frac{\gamma a_2(\eta + \bar{y}) - g(\gamma a_2 a_1 + \delta b_2 b_1)}{\omega}, \tag{14}$$

with $\omega = \gamma a_2^2 + \delta b_2^2$.

The non-cooperative solution, however, provides the Bundesbank with yet another possibility, as it is now totally unrestricted in choosing $\tilde{m}$. Without the government reneging on the agreement, the Bundesbank would have no excuse for tightening domestic money supply. However, given the Maastricht treaty and knowing that under certain circumstances the foreign government will rather leave the EMS to stabilize output, the Bundesbank sees an opportunity to push out the foreign country and thereby reduce the probability of monetary union or at least hinder the process towards it. This can be achieved by tightening $\tilde{m}$ even a bit further.[13] Assuming that the Bundesbank knows the critical difference between $\tilde{m}^*$ and φm for the foreign country, given the shock ξ, it can calculate a money supply tight enough to establish its aim of EMS collapse.

The critical value of its own money supply for which the foreign authority will drop out of the EMS is, by inverting (13), defined to be

$$\overline{m} \equiv \frac{\tilde{m}^*(\xi) + (\lambda^*/\upsilon^*)^{1/2}}{\varphi}. \tag{15}$$

That is, for any $m < \overline{m}$ set by the Bundesbank, the foreign authority will leave the EMS.

When setting its monetary target after GMU, however, the Bundesbank is uncertain whether the shock ξ will occur. Never-

[13] Thus, while Germany's five big economic research institutes regarded a target range for M3 money supply of 6-8% as being more appropriate, the Bundesbank only set a target rate of 4.5 to 6.5% for 1993 (*The Economist*, July 31, 1993, p. 70).

theless, it has to decide on the course of its future monetary policy and to stick to it in order to defend its already damaged reputation. Yet the Bundesbank knows that with a certain probability P an adverse shock ξ will occur in the form of a recession which spills over to Europe. P can either be seen as the probability of the occurrence of a shock or, alternatively, as uncertainty concerning the magnitude of the shock. It gives the opportunity to drive the foreign country out of the EMS. Thus the Bundesbank's expected utility for that case is given by

$$(16) \qquad \underset{m}{EU}_B = PU_B(m) + (1 - P)\,[U_B(m) - \mu Dh]\,,$$

$$\text{with} \qquad h = \begin{cases} 1, & m < \overline{m} \\ 0, & m \geq \overline{m}\,, \end{cases}$$

where P is the probability that $\xi = 1$ and $(1 - P)$ is the probability that $\xi = 0$. (16) captures the possibility of driving other countries out, given the occurrence of the shock, but also depicts the risk of setting money overly tight ($h = 1$) when no shock occurs. By comparing its utility levels $[U(\tilde{m}) - EU(\overline{m})]$, the decision problem is

$$(17) \qquad m = \max\left\{\tilde{m},\ \overline{m} - \left(\frac{P\mu}{\omega}\right)^{1/2}\right\}.$$

According to equation (17), the Bundesbank will choose the money supply which yields the highest utility. Consequently, important factors for the Bundesbank are the probability P that ξ occurs and the value the Bundesbank places on the EMS goal. If the unconstrained money supply $\tilde{m}$ is sufficiently larger than the restrictive level $\overline{m}$, the Bundesbank will prefer not to lose public support in Germany by being restrictive and let thus the other country stay in the EMS. If, however, the difference is not large enough, the Bundesbank will set $\overline{m}$. In this case the EMS will fall apart. For the money supply of the Bundesbank is now too tight for others to follow. The foreign country no longer adheres to the EMS.

D. *The German government*

Faced with the adverse shock of German unification η and knowing the reaction of the Bundesbank, the German government has to decide whether to break the agreement with the Bundesbank, even if this implies a relatively tighter money supply, making even more fiscal spending necessary as it undermines the positive effects of $\tilde{g}$. Moreover, it knows that this might also endanger the future of the EMS. In the case of a negative shock for the foreign authority, the Bundesbank might take the chance to dissolve the EMS by making its monetary policy too restrictive. Thus, the government must not only decide on the future relationship with its own central bank when breaking the implicit contract with it, but also on the external effects of its policy choice.

The government's decision problem is thus given by

$$(18) \qquad \max U_G(\eta) = \begin{cases} \underset{g_c}{U}_G\,(g_c, m_c), & \text{for } m = m_c \\ \underset{\tilde{g}}{EU}_G\,(\tilde{g}, m), & \text{for } m = \begin{cases} \tilde{m} \\ \overline{m} \end{cases} . \end{cases}$$

The government has to compare the utility derived from continuing the cooperative policy with regard to the Bundesbank, in which case g_c is relevant, or to set $\tilde{g}$ in a non-cooperative manner. In the second case, expected utility is dependent on the choice of the Bundesbank's money supply. By using (1), (2) and (3), the non-cooperative choice of government spending is given by

$$(19) \qquad \tilde{g} = \frac{\alpha a_1\,(\eta + \bar{y}) - m(\alpha a_1 a_2 + \beta b_1 \beta_2)}{\rho}$$

$$\text{with} \qquad \rho = \alpha a_1^2 + \beta b_1^2 .$$

By comparing utility levels $[U_G\,(\tilde{g}) - U_G(g_c)]$, the government will decide to play non-cooperatively if

$$(20) \qquad \tilde{g} > g_c + (m_c - m)\left(\frac{\upsilon}{\rho}\right)^{1/2} - \left(\frac{\lambda}{\rho}\right)^{1/2} .$$

In this case, the re-election motive of the German government is strong enough for it to break the contract with the Bundesbank, even knowing that this may instigate the collapse of the EMS. According to this perspective, the German government embarked on the Maastricht accord to signal its commitment to European unity all the while knowing that its own action in the course of German unification would incur the risk of breaking the treaty. One could thus also place the blame for the EMS collapse mainly on the German government, whose actions, due to dominant re-election motives, prompted the Bundesbank to use its independence to obstruct the Maastricht process. One might speculate that, had the government not signed the treaty as a compensation to other European countries for their acceptance of German unification and confronted the Bundesbank when deciding on the conversion rate, the EMS might still be intact. That the German government actually sought the EMS collapse to undermine the whole process of European integration, however, seems too strong a conclusion, since German industry, being an important interest group, is dependent on European trade relations.

5. Conclusion

The model in this paper presents only one possible way to understand the events in Europe after German unification, which eventually led to the EMS crises and collapse, without being necessarily in contrast to other interpretations. It is, although speculative, consistent with the facts and events leading to the EMS collapse. The behavior and statements by the Bundesbank are supportive of this interpretation, although the Bundesbank would deny it. The fact that it lowered its interests rates immediately after having achieved its aim especially supports the hypothesis advanced here.

This model basically sheds light on the decisive role that one crucial actor, the Bundesbank, might have played in the EMS collapse and is thereby a first step towards filling an important gap in the literature. The important lesson from the recent crises is that more attention must be directed towards the diverging interests of independent authorities such as central banks. Although no one should doubt the benefits of an independent central bank, one should also

note that the central bank can obstruct politically-set decisions out of pure self-interest and thus undermine international agreements. Ironically, the Maastricht treaty, which requires independent central banks for monetary stability, may eventually result in more such problems when central banks try to realize their own objectives (see Kenen 1992 on the democratic deficit of the planned European Central Bank). The abuse of bureaucratic self-interest by central banks is surely a field which deserves more research, especially in the context envisaging a common and independent European Central Bank.

REFERENCES

ANDERSEN, TORBEN and FRIEDRICH SCHNEIDER (1986), "Coordination of fiscal and monetary policy under different institutional arrangements", *European Journal of Political Economy*, 2, 169-191.

BOFINGER, PETER (1991), "Geld- und Kreditpolitik nach Bildung der deutschen Währungsunion", in H. Gröner, E. Kantzenbach and O. Meyer, Hrsg., *Wirtschaftspolitische Probleme der Integration der ehemaligen DDR in die Bundesrepublik*, Duncker & Humblot, Berlin, 151-175.

BUNDESBANK (1991), *Monthly Report*, October, Frankfurt.

BUNDESBANK, *Auszüge aus Presseartikeln*, various issues.

CANZONERI, MATTHEW B. and BEHZAD T. DIBA (1991), "Fiscal deficits, financial integration, and a central bank for Europe", *Journal of the Japanese and International Economies*, 5, 381-403.

DE GRAUWE, PAUL (1993), "The political economy of monetary union in Europe", *World Economy*, 16, 653-661.

DE GRAUWE, PAUL (1994), "Towards European Monetary Union without the EMS", *Economic Policy*, 18, 147-185.

EICHENGREEN, BARRY (1993), "The crisis in the EMS and the transition to EMU: an interim assessment", University of California at Berkeley, mimeo.

EICHENGREEN, BARRY and CHARLES WYPLOSZ (1993), "The unstable EMS", *Brookings Papers on Economic Activity*, 1, 51-143.

FRANZ, WOLFGANG, GUSTAV HEIDBRINK and WERNER SMOLNY (1993), "The impact of German unification of West Germany's goods and labor market: a macroeconomic disequilibrium model in action", paper presented at the Tel Aviv-Konstanz Conference on International Economics, Konstanz, October 14-15.

FRATIANNI, MICHELE and JÜRGEN VON HAGEN (1992), *The European Monetary System and European Monetary Union*, Westview, Boulder.

FREY, BRUNO S. and FRIEDRICH SCHNEIDER (1981), "Central bank behavior: a positive empirical analysis", *Journal of Monetary Economics*, 7, 291-315.

GARRETT, GEOFFREY (1993), "The politics of Maastricht", *Economics and Politics*, 5, 105-123.

GOODMAN, JOHN B. (1992), *Monetary Sovereignty: The Politics of Central Banking in Western Europe*, Cornell University Press, Ithaca.

HARTWIG, KARL-HANS (1984), "Bundesbankautonomie und Inflationsbekämpfung: Politische Ökonomie des Notenbankverhaltens", *List-Forum*, 12, 307-322.

HAVRILESKY, THOMAS (1994), "The political economy of monetary policy", *European Journal of Political Economy*, 10, 111-134.

HUGHES HALLETT, ANDREW and Y. MA (1993), "East Germany, West Germany, and their Mezzogiorno problem: a parable for European economic integration", *Economic Journal*, 103, 416-428.

KENEN, PETER B. (1992), *EMU After Maastricht*, Group of Thirty, Washington.

KRÖGER, JÜRGEN and MANFRED TEUTEMANN (1992), "The German economy after unification: domestic and European aspects", *Economic Papers*, 91, Commission of the European Community.

MARSH, DAVID (1992), *The Bank that Rules Europe*, Heinemann, London.

MELITZ, JACQUES (1991), "German reunification and exchange rate policy in the EMS", *CEPR Discussion Paper*, 520, February.

PORTES, RICHARD (1993), "EMS and EMU after the fall", *World Economy*, 16, 1-15.

SANDHOLTZ, WAYNE (1993), "Choosing union: monetary politics and Maastricht", *International Organization*, 47, 1-39.

SIEBERT, HORST (1991), "German unification: the economics of transition", *Economic Policy*, 13, 287-340.

SVENSSON, LARS E.O. (1994), "Fixed exchange rates as a means to price stability: what have we learned?", *European Economic Review*, 38, 447-468.

VAUBEL, ROLAND (1993a), "Die deutsche Bundesbank als Modell für eine europäische Zentralbank?" in D. Duwendag and J. Siebke, Hrsg., *Europa vor dem Eintritt in die Wirtschafts- und Währungsunion*, Duncker & Humblot, Berlin, 23-79.

VAUBEL, ROLAND (1993b), "The breakdown of the ERM and the future of EMU: explanations, predictions and simulations from a public choice perspective", University of Mannheim, mimeo.

VON HAGEN, JÜRGEN (1992), "German unification: economic problems and consequences. A Comment", *Carnegie-Rochester Conference Series on Public Policy*, 36, 211-222.

WYPLOSZ, CHARLES (1991), "On the real exchange rate effects of German unification", *Weltwirtschaftliches Archiv*, 127, 1-17.