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Economic Commentary

Lessons from the European Monetary System

by Nicholas V. Karamouzis

Many economists and policymakers have argued that the industrialized countries could minimize exchange-rate volatility and enhance economic stability if West Germany, Japan, and the United States linked their currencies in a target-zone arrangement.

Under a target-zone system, countries adjust their national economic policies to maintain their exchange rates within a specific margin around agreed-upon, fixed central exchange rates.[1] Such a system already exists for the major European currencies in the form of the Exchange Rate Mechanism (ERM) of the European Monetary System (EMS). A review of the ERM provides valuable lessons about the operations, costs, and benefits of target-zone arrangements.

The European Monetary System began operating in March 1979. Its purpose is to foster monetary stability in the European Economic Community, which is a prerequisite for achieving the economic and monetary union of Europe. All members of the European Economic Community, except Portugal, have signed the EMS Agreement, but Greece, Great Britain and Spain have opted not to participate in the Exchange Rate Mechanism.[2]

The ERM has gone through some periods of strain and must still address some difficult problems. Nevertheless, it has not degenerated into a system of frequent small exchange-rate adjustments, as some critics had forecast. On the contrary, according to some analysts the ERM has reduced the volatility of both nominal and real exchange rates in large part by fostering the convergence of inflation and money growth rates towards those of the best performer, West Germany.[3]

This *Economic Commentary* discusses the exchange-rate mechanism of the European Monetary System. The first three sections describe the operation of the ERM. The final section highlights some problems facing the ERM that are germane to the operation of any target-zone system.

The Operating Components of the ERM

The Exchange Rate Mechanism consists of four major components: the European Currency Unit, the parity grid, the divergence indicator, and the credit facilities. Because we are interested in the exchange-rate management of the ERM, we briefly discuss the European Currency Unit and then focus on the parity grid and the divergence indicators.

The European Currency Unit (ECU) is a composite currency, consisting of fixed amounts of 10 European currencies.[4] The quantity of each country's currency in the ECU reflects that country's relative economic strength in the European community. The ECU functions as an unit of account, as a means of settlement, and as a reserve asset for the members of the ERM. Recently, it has received growing use as a unit of account and as a means of payment in private transactions. Since the ECU is a composite of many currencies, its exchange value is less prone to large exchange-rate swings than are individual currencies.

Three short-term credit mechanisms enable one ERM member central bank to borrow funds from another to finance exchange-market intervention. The Very Short-Term financing facility provides an unlimited amount of very short-term credit to finance intervention at the compulsory intervention margins. The Mobilization Mechanism permits temporary exchanges of official ECUs for currencies, mainly to finance *intramarginal* intervention, or intervention to influence exchange rates within the permissible bands. The Short-Term Monetary Support provides credits based on a member's balance of payments and/or the foreign-exchange reserve position.

The European Monetary Cooperation Fund coordinates and facilitates all transactions. Official ECUs serve as a means of settlement in these transactions. Each central bank deposits at least 20 percent of their gold and dollar reserves with the European Monetary Cooperation Fund in exchange for official ECUs.

The Parity Grid

Subject to the agreement of all the participants, each member of the exchange-rate mechanism determines a central exchange rate for its currency, which is denominated in currency units per ECUs. These central rates attempt to establish equilibrium exchange values for the currencies, but members can seek adjustments to the central rates. The ERM countries have adjusted the central rates 11 times since the establishment of the EMS. With the most recent realignment on January 12, 1987, the ECU central rates have been: 42.4582 Belgian francs, 7.85212 Danish kroner, 2.05853 Deutsche marks, 6.90403 French francs, 2.31943 Dutch guilders,

Nicholas V. Karamouzis is an assistant economic advisor with the Bank of Greece and a visiting scholar at the Federal Reserve Bank of Cleveland. *The author benefited from his participation in the Foreign Exchange Group of Experts under the Committee of the Central Banks of the Member States of the European Economic Community. He also thanks Gerald H. Anderson, Owen F. Humpage, and Mark Sniderman for their comments.*

1. See Owen F. Humpage and Nicholas V. Karamouzis, "Target Zones for Exchange Rates?" *Economic Commentary,* Federal Reserve Bank of Cleveland, August 1, 1986.

Table 1 Parity Grid[a]

		Germany	Denmark	Ireland	France
	+ 2.25		3.9016	.38182	3.4305
DM	Central rate	1	3.81443	.37328	3.35386
	- 2.25		3.7300	.36496	3.2792
	+ 2.25	.26810	1	.10008	.89225
DKr	Central rate	.26216		.09786	.87925
	- 2.25	.25630		.09568	.85970
	+ 2.25	2.740	10.451		9.1890
Irish pound	Central rate	2.678	10.2186	1	8.9848
	- 2.25	2.619	9.9913		8.7850
	+ 2.25	.30495	1.1632	.11383	
FF	Central rate	.298164	1.13732	.111299	1
	- 2.25	.29150	1.1120	.108825	

a. All exchange rates are expressed in terms of national currencies rather than in terms of ECUs.
SOURCE: Author.

0.798411 Irish pounds and 1483.58 Italian liras.

These central rates establish a grid of bilateral cross exchange rates among the currencies. For example, 2.05853 Deutsche marks per ECU divided by 7.85212 Danish kroner per ECU equals 0.262162 marks per kroner, which also implies 3.81443 kroners per mark (See table 1).

Nations participating in the exchange-rate mechanism agree to keep their currencies within a 2.25 percent margin on either side of these central cross exchange rates, except Italy which has 6 percent margins.[5]

Continuing our example, if the Danish kroner should strengthen against the Deutsche mark and reach the upper intervention limit, the Bundesbank will sell kroner to commercial banks at 3.73 kroners per mark, while Denmark's National Bank will buy marks at 0.26810 kroners per mark.

It is rare for an exchange rate to move from the lower band to the top band (4.5 percent) against a single currency. If the Deutsche mark started strengthening from the lower limit against the Danish kroner, it probably would reach an upper intervention limit against another currency before it reaches the upper limit against the Danish kroner.

A convenient way to monitor the relative position of each currency in the band is to construct the so-called "narrow band of fluctuations." Usually the narrow band shows the position of each ERM currency relative to the weakest currency in the group. It expresses the weakest currency's market exchange rate vis-a-vis each participant currency as a percentage deviation from the weakest currency's central rate vis-a-vis each participant currency.

Chart 1 shows the relative position of ERM currencies against the Belgian franc, on May 26, 1987. As the chart indicates, the Danish kroner was the strongest currency in the ERM on that day, with the Danish kroner/Belgian franc rate deviated 1.87 percent from the Danish kroner/Belgian franc central rate.[6] All will lie within a band of 2.25 percent, except possibly the Italian lira.

The Divergence Indicator

Each member of the ERM must intervene when its currency reaches the 2.5 percent band against any other ERM currency. Ideally, ERM members would like to know when pressure is building on their exchange rates, so that they could take corrective action before their exchange rates reach the 2.5 percent bands. The divergence indicator attempts to provide such an early warning signal.

Basically, the divergence indicator measures the amount that an exchange rate actually has moved from its central rate, expressed as a percentage of the maximum movement allowable under the 2.5 percent bands. A "threshold of divergence" is established at 75 percent of the maximum possible movement. When a currency crosses its "threshold of divergence," the authorities of the country concerned should implement corrective policies.

On several occasions, however, the divergence indicator has failed to provide an early warning signal. In part, the widespread practice of intramarginal intervention distorts the signal, but the indicator also suffers from inherent technical problems.[7] The ERM members need to modify the divergence indicator and to develop new indicators that trigger consultation and policy responses among the participants.

The Functioning of the System

When a ERM currency diverges too far from the central cross rates, appropriate countries must introduce policies to reduce the pressure on the exchange rates. European policymakers generally can employ three complimentary policies to deal with short-term pressures on their exchange rates: 1) intramarginal intervention, 2) fuller use of the exchange-rate bands and intervention at the compulsory margins, and 3) adjustment of interest rates.

Although experience varies, most ERM countries adopt intramarginal intervention as the first line of defense. Central banks of relevant countries undertake such intervention and usually do not coordinate their activities with other ERM central banks.

If market pressure persists, usually the central banks of the "weak"currencies allow their exchange rates to move closer to the lower boundary of the band and/or adjust their domestic interest rates upward. The aim is to penalize speculators by making speculation costly and less rewarding. If such policies do not stem the pressure on the exchange rate, or if the relevant countries cannot implement the appropriate policies because of political or domestic policy constraints, then EMS members eventually will need to realign the central rates.

Observations on the ERM

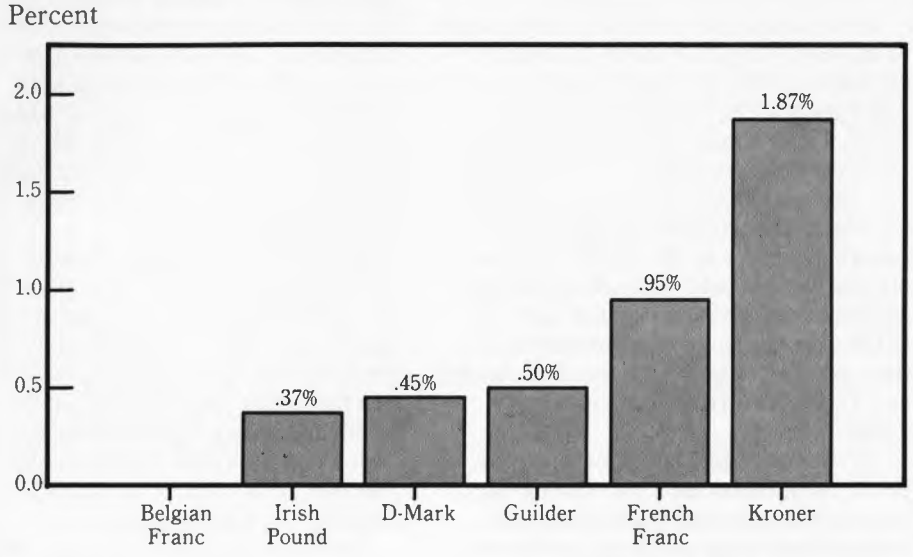
The ERM provides valuable insights into the operations of target-zone arrangements, and illustrates the problems that such mechanisms are likely to encounter. Perhaps the most important lesson that the ERM illustrates is that the

2. Throughout this paper, *ERM* refers to countries participating in the Exchange Rate Mechanism. They are: Belgium-Luxembourg, Denmark, France, the Federal Republic of Germany, Ireland, Italy, and the Netherlands. EMS refers to countries that are members of the European Monetary System.

3. See Horst Ungerer, Owen Evans, Thomas Mayer and Philip Young. "The European Monetary System: Recent Developments," *IMF Occasional Paper No. 48,* December 1986.

4. For details about the ECU, see: *The ECU,* European Documentation No. 6/84 (51 pp.), European Community Information Service, Washington, D. C.

Chart 1 The Narrow Band on May 26, 1987*



SOURCE: Author.

*The Italian lira is not included.

exchange-rate stability afforded by any target-zone arrangement requires a coordination of economic-policy objectives. Nations should achieve convergence of those economic variables that directly affect exchange rates, such as fiscal deficits, current-account imbalances, and real economic growth differentials.

Among the ERM countries, the fundamental nonmonetary determinants of exchange rates are slowly converging. Although monetary policies also have become more similar, the participants do not agree that zero inflation should be the ultimate objective of the European Economic Community. Consequently, monetary authorities in the ERM countries often face a policy dilemma between exchange-rate stability and interest-rate stability, and face a conflict between domestic and external objectives.

The European experience has shown that an aggressive interest-rate policy is the most effective means of stabilizing exchange rates, particularly when countries coordinate their policies. The need for such coordinated policies has increased as EMS countries have lifted restrictions on capital flows. Almost all EMS countries have liberalized restrictions on capital flows related to commercial transactions and to long-term financial transactions. Most countries anticipate further liberalization of restrictions against short-term financial flows in the near future.

As a result, small profit opportunities will induce large capital movements which, other things equal, will require larger amounts of intervention to defend the parities. The experience with the January 12, 1987 realignment confirms this view. In January, the volume of speculative capital movements overwhelmed attempts to stabilize exchange rates through intervention.

Exchange-rate stability requires that interest-rate policies be coordinated and geared towards maintaining exchange-rate parities. But there are differences of opinion among ERM members. Germany is reluctant to adjust interest rates downward when the Deutsche mark is under upward pressure, because it claims that such actions could jeopardize domestic price stability. Similarly, others are reluctant to increase interest rates when their currencies depreciate because they fear a detrimental impact on their budget deficits and on their domestic economic activity. A few countries, like the Netherlands, allow domestic interest rates to move widely to contain exchange-rate pressures.

Economic convergence takes time; in the meantime, realignments may be unavoidable. If financial and real shocks predominate over monetary shocks as the major source of exchange-rate instability, policymakers will find it hard to determine the need for and proper magnitude of an exchange-rate realignment. Unfortunately, we have no precise methods for relating economic variables to exchange rates and, therefore, have no precise way of determining the "equilibrium" value of exchange rates. At a minimum, participating countries should cooperate and develop methods of monitoring economic developments in order to identify at an early stage possible signs of tension in the ERM.

Although some exchange-rate adjustment is unavoidable when national economic experiences conflict, the ERM has no formal rules for determining the timing and magnitude of realignments in central rates. In the past, ERM countries adjusted their central rates to offset differentials among their inflation rates. This strategy implicitly provided a quantitative guide and a justification for exchange-rate realignments. Now that relative money growth rates and inflation rates within the ERM have become more similar, realignments might be smaller and less frequent than in the past.

On the other hand, it could be harder for the countries involved to agree on new central rates. At the January 1987 realignment, for example, France and Germany disagreed sharply over which country's policies had caused the exchange problem and, consequently, on which country should adjust and by how much. The ERM countries eventually agreed that the German mark would be revalued, along with the Belgian franc and the Dutch guilder.

Target-zone arrangements generally specify in very broad terms that participants should adjust economic policies when exchange rates threaten to break through the bands. Typically, however, a disproportionately large share of the adjustment burden has fallen on the "weak" currency countries.

Countries with appreciating currencies, trade surpluses and increases in reserves are less prone to adjust than countries with depreciating currencies, trade deficits, or reserve losses. This view is supported by the convergence of inflation rates among the ERM countries. An equal sharing of the adjustment burden implies that rates of inflation among the participant countries would converge to the average rate.

Germany, however, has maintained a domestic monetary target of low or zero inflation, and often has refused to alter domestic monetary policy because of

5. The figure ± 2.25 percent is only an approximation. To preserve symmetry, the actual limits are 2.27531 above, and 2.22469 below the central rates.

6. This is calculated as follows: The Danish kroner/Belgian franc market rate on May 26th was 0.18147651; the central cross rate was 0.1849376. Subtracting the ratio: 0.18147651/0.1849376 from one yields 0.0187 or 1.87 percent. In a similar way, we can calculate the deviations of the other ERM currencies from the Belgian franc.

7. See Roland Vaubel. "The Return to the New European Monetary System Objectives, Incentives, Perspective," Carnegie Rochester Conference Series on Public Policy 13 (Autumn 1980), pp. 173-221.

exchange-rate considerations. Because of Germany's economic importance within the European Community, the other participant countries have had to adjust their domestic policies or their exchange rates to remain competitive in international markets under the constraint of German monetary policy.

Nations participating in the ERM arrangement often buy and sell foreign currencies to defend their exchange rates. Unfortunately, when such intervention is not supported by a change in a nation's monetary policy, nor coordinated with the intervention activities of other central banks, it only has a limited influence on exchange rates.[8]

The heavy intervention preceding the January 12, 1987 realignment, for example, was mostly intramarginal and generally was not accompanied by changes in nations' monetary policies. Germany, in particular, made only small adjustments to monetary policy in response to the exchange-rate pressures. Consequently, the intervention failed to contain speculation, and a realignment became unavoidable.

There are other problems. If a target zone arrangement does not include all major currencies, it may be vulnerable to exchange-market pressures emanating from outside. On occasion, exchange-rate stability in the ERM has been compromised by exchange-rate volatility of nonparticipating currencies vis-a-vis the ERM currencies.

In particular, the Deutsche mark tends to appreciate against other European currencies when the dollar depreciates.[9] The January 1987 realignment in the ERM, for example, was necessitated in large part because the dollar's depreciation against the Deutsche mark caused the mark to appreciate relative to the other currencies in the ERM. Such realignments become necessary because international investors do not hold all ERM currencies in equal proportions in their portfolios and because of economic and financial differences among the ERM countries.

To deal with this phenomenon, the ERM countries need a common policy response to external disturbances in general and to the dollar in particular. For example, an upward adjustment of interest rates by the ERM countries, except Germany, could have helped divert part of the capital flows that moved into Deutsche marks into other ERM currencies.

Conclusion

As this brief review has suggested, the success of any target-zone arrangement for exchange rates depends on the ability of participant countries to agree on many facets of policymaking and implementation. The slow progress of the European community with respect to the ERM and policy coordination, however, exemplifies the difficulties of achieving agreements on these many points. Implementing target zones on a wider scale would be all the more difficult. Differences in preferences, policy objectives, and economic structures account in part for these difficulties.

More fundamentally, however, coordination of macroeconomic policies will not necessarily benefit all participant countries equally, and those that benefit the most may not be willing to compensate those that benefit least. In the ERM, Germany is less inflation-prone than the other ERM countries and is reluctant to cooperate at the risk of increasing its inflation rate.[10]

Similarly, if benefits to the United States from coordination of macroeconomic policies with the other industrial countries are small, the United States may be reluctant to relinquish its policy independence, which is a necessary condition for an effective coordination of policies and for the maintenance of target zones. Until the participant countries can agree on these issues, realignments of ERM currencies, and worldwide exchange-rate fluctuations, will be unavoidable.

8. See Deborah Danker, Richard A. Haas, Dale W. Henderson, Steven A. Symansky and Ralph W. Tryon, "Small Empirical models of Exchange Market Intervention: Applications to Germany, Japan, and Canada," Board of Governors of the Federal Reserve System, *Staff Studies 135,* April 1985 and references.

9. See Francesco Gravazzi and Alberto Giovannini, "The EMS and the Dollar," *Economic Policy,* No. 2 (April 1986), Cambridge University Press, London, pp. 455-484.

10. Actually, a recent study argued that policy cooperation could introduce an inflation bias to the EMS. See Kenneth Rogoff, "Can International Monetary Policy Coordination be Counterproductive?" *Journal of International Economics,* May 1985, No. 3/4 pp. 199-218.

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