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" The European Monetary System (1979-1988) Achievements, flaws and applicability to other regions of the world "

Background Paper for Special Session IV on Global Financial Issues*

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The European Monetary System (1979-1988)
Achievements, flaws and applicability to other regions of the world

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1. Introduction

Accompanied by much public and academic criticism the German Chancellor, Helmut Schmidt, and the French President, Valéry Giscard d'Estaing decided in 1978 to establish a fixed exchange rate system for the member countries of the European Union. The system was agreed in principle at the European Council in Bremen of 6/7 July 1978. Its concrete agreements were decided by the European Council on 5 December 1978. The new scheme started on March 19, 1979 and it with some modifications it was operated in its original form until the beginning of European Monetary Union, on January 1, 1999.[1] In retrospect it is obvious that without the EMS the introduction of the euro would not have been possible. Thus, the EMS constituted an important intermediary step to EMU which is now regarded as a very efficient monetary arrangement for most member countries of the EU.

Besides this specific integration target, the literature enumerates three different reasons for the membership in an exchange rate system:

- The fixed exchange rate vis-à-vis an "anchor currency", i.e. a currency with a very low inflation rate, can be used as a "nominal anchor" for a policy of disinflation. In other words, a fixed exchange rate is regarded as a "monetary rule" (McCallum 1989). In the 1980s many observers considered this as the main function of the EMS. It left them with the difficult question of how to explain Germany's interest in this scheme.

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[1] For a survey of the history of European integration see Appendix 1.

- As flexible exchange rates are prone to instability in the short run ("volatility") and in the medium-term ("misalignments"), a fixed rate system can be regarded as a mechanism that prevents such disturbances.

For an analysis of how the EMS has performed with respect to these targets, we will discuss the following questions: :

- What were the main features of its founding members in 1979?
- How was the institutional framework of the exchange rate mechanism (ERM) designed?
- What were the main achievements of the ERM in the two decades of its existence?
- What were the reasons for the exchange rate crises in 1992/93 and how could they have been avoided?

This allows to show which features of the EMS could be copied by countries in other geographic areas and which modifications would be required or advisable.

2. The interests of founding members of the EMS

In March 1979, all ten EU member countries participated in the EMS. However, the United Kingdom and Greece did not become members of the ERM. Thus, their membership was of a purely formal nature, except the fact that their currencies were included in the new ecu currency basket which created a lot of technical complications.

At the start of the ERM the eight participants were relatively heterogeneous countries (see Table 3). Their population varied from 360,000 inhabitants (Luxembourg) to 61,3 million inhabitants (Federal Republic of Germany). The per capita income of the poorest country (Ireland) was only 58 % of the most wealthy country (Netherlands). The inflation rate in Italy (14.7 %) was more than three times higher than the inflation rate in Germany (4.1 %). And while Germany had still practically full employment (unemployment rate: 3.2 %), Italy was already confronted was a serious unemployment problem (unemployment rate: 7.8 %). Major differences can be observed in terms of the eight countries' openness.[2]

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[2] Defined as the average of exports and imports to GDP.

While each of the three Benelux countries had a degree of openness of 50 % and more, France was a relatively closed economy (18.3 %). This also implies that the ratio of trade that was conducted with other ERM members to GDP varied considerably: from 31.5 % in Belgium to only 7.6 % in France.

The interest in a stable nominal anchor

In spite of these differences the ERM countries had very similar interests as far as exchange rate and monetary policy arrangements are concerned. In the 1970s inflation was a serious problem for many European countries. Given the high credibility of the Bundesbank's monetary policy and the relatively low inflation rate in Germany in 1978, there was an incentive for the high-inflation ERM members to target a stable nominal D-Mark exchange rate. We shall discuss the importance of this approach in more detail in the following sections.

The interest in stable exchange rates in the short-run

A second important link between all countries was their membership in the European Community as the EU was called at that time. The regulations of the Treaty of Rome which had established the forerunner of the EC, the European Economic Community, had above all two implications for exchange policies:

- The EC member were obliged to guarantee the "*free movements of goods*" within the Community by abandoning all taxes and other barriers to trade vis-à-vis other member countries. (Articles 23 to 31 of the Treaty in its present form). This "common market" for goods became especially effective since all ERM countries are located within a rather concentrated regional area. Within a radius of about 1000 kilometres around Frankfurt almost all major economic centres of Europe can be found. The ERM members in continental Europe have long common borders (with the exception of Italy). Thus, transportation costs are rather small.
- For the agricultural sector, the Treaty envisaged a scheme of strongly regulated prices that were identical in all member countries, the so-called "*common agricultural policy*". Its principles are defined in the Articles 32 to 38 of the Treaty in its present forms.

For both areas short-term exchange rate instability has very unpleasant consequences. In an area without trade restrictions and low transportation cost, deviations from the "law of one price" will be very limited. Thus, if exchange rates are highly volatile in the short-term,

- firms which export to the whole area have to adjust the local prices very often which is associated with high "menu costs" and makes local pricing policies highly erratic or
- the deviations of the law of one price will lead to arbitrage transactions that have negative effects for the local suppliers[3].

In other words, the strategy of "pricing-to-the-market" which firms normally use to cope with short-term exchange rate instability is much more difficult to apply in an area that constitutes a "common market".

In the agricultural sector which is organised completely different from the rest of the common market, deviations from the "law of one price" also create major problems. The common organisation of agricultural markets relies heavily on a common price policy. Thus, for many products intervention prices have to be set on an annual basis in a common currency. Strongly fluctuating exchange rates again provide opportunities for arbitrage which impair or benefit local producers in an arbitrary way. In order to deal with this problem a highly complicated system of "green parities" and compensating payments was required.

Thus, because of highly integrated markets most members of the EU had a very strong interest in avoiding short-term exchange rate instability between their currencies.[4] Until the erosion of the Bretton Woods system in August 1971 and its final breakdown in March 1973, a high degree of exchange rate stability was provided indirectly simply by adhering to this international monetary system. As shown in Appendix 1, the first major political initiative for a European monetary union started in 1969, a time when the decline of the Bretton Woods system was already under way.

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[3] In this respect interregional instability of the value of money has the same effects as the intertemporal instability of the value of money.
[4] This explains why especially Germany was interested in the ERM. To many economists (Melitz 1987) the rationale of Germany's participation is unclear.

After the widening of the band widths around the dollar parity to ± 2.25% in December 1971, which enlarged the exchange rate band between the non-dollar currencies to ± 4.5%, the European countries almost immediately (on April 1972) established a framework which limited these fluctuations to ± 2.25%. As the working of this "*snake*" is identical with that of the Exchange Rate Mechanism of the EMS, it will not be explained separately. The "snake" started with the six EEC founding members, the UK and Denmark joined soon, but they stayed in the "snake" only for a short period. Norway and Sweden became associated members. After withdrawal of Italy in 1971, a first (1974) and a second (1976) withdrawal of France, and a withdrawal of Sweden (1977), in 1978 the snake included only Germany, the three Benelux states and Norway. It was in this situation of relatively unsettled European monetary affairs that Helmut Schmidt and Valéry Giscard d'Estaing decided to start a more comprehensive approach to European monetary integration.

The interest in stable real exchange rates

With the high degree of integration of the ERM countries goods markets it also obvious that these countries had an interest to avoid exchange rate misalignments. Major changes in real exchange rates are identical to relative changes in domestic cost, above all nominal wages. Thus, shifts in real exchange rates are identical with shifts in the competitiveness which can only be corrected with adjustments in domestic price and wage levels. Such adjustments are especially difficult to achieve in countries with an appreciating country as this would require an absolute fall of nominal wages.

Given the fact that D-mark tended to a strong appreciation at that time, it becomes understandable that the initiative for the ERM had come from the German chancellor. But in a highly integrated area stable real exchange rates are in the interest of all countries as they exclude unilateral attempts to improve the situation of domestic producers by a beggar-thy-neighbour-policy. Thus, a scheme like the ERM has the important advantage that exchange rates changes are subject to a common decision process.

3. The rules of the ERM

3.1 The parity grid of exchange rates

The core of the ERM was provided by a so-called *parity grid*, a matrix of bilateral exchange rates. It defined for each member currency a parity vis-à-vis all other ERM currencies. The Belgium and the Luxembourg franc were treated as a single currency since both countries had established a currency union years before. Around this parity a band of ± 2.25 % (for the lira of ± 6 %) was defined. After the 1992/93 ERM crises, the band was widened to ± 15 %. It constituted for each currency an upper and a lower intervention point vis-à-vis all other currencies.

The symmetry of the bilateral parities implied that whenever a currency A reached its *upper* intervention point vis-à-vis currency B (i.e. it depreciated vis-à-vis this currency), currency B simultaneously reached its *lower* intervention point vis-à-vis currency A. Thus, if a currency pair drifts to its bands, there are always two central banks that have an obligation to intervene.

This *formal* symmetry of the ERM's intervention obligations has led to a lot of confusion about the adjustment processes among the member countries. For an assessment of an exchange rate system the crucial question is always whether it is the country with the weak currency (or in a more traditional language the "deficit country") or the country with the strong currency (the "surplus country") that has to bear the adjustment if major shocks occur. In their very careful analysis of the EMS Gros and Thygesen (1998, p. 179) come to the following conclusion:

> "The system was therefore never totally asymmetric, but the available indicators suggest that German monetary policy was more important to France and Italy than vice versa."

While most economists try to assess this issue with econometric tests, it seems more appropriate to analyse the concrete intervention procedures of the ERM with a simple example. Assume a situation that occurred quite frequently in the 1980s. The French franc came under attack and depreciated vis-à-vis the D-mark until it reached its intervention

points. Thus, the Banque de France (BdF) and the Bundesbank were both obliged to intervene on the foreign exchange market.

The *Banque de France* had to buy its own currency by supplying D-marks to the market. For that purpose it could use either its own reserves or the credit lines of the "*very short-term financing*" (VSTF) . This credit mechanism of the ERM was *unlimited* in the short-term. But it had to be repaid by the debtor central bank in assets other than its own currency, in principle one month and a half after the end of the month when the intervention took place.[5] The credit could be prolonged but then it was limited to relatively small quotas. Thus, for its interventions the BdF was operating under a strict budget constraint that limited its ability to cope with a persistent speculative attack simply by means of (sterilised) intervention. In other words, it had either the option of raising interest rates and following a more restrictive monetary policy or to devalue. As in the 1980s the Bundesbank was the central bank with the most stability-oriented approach, the former applied an adjustment towards the Bundesbank's policy stance.

The *Bundesbank* was simultaneously required to support the franc by buying franc assets and supplying D-marks to the foreign exchange market. For an understanding of the Bundesbank's interventions it is important to differentiate between the effects on the liquidity of German banks and on the reserves of the Bundesbank and the BdF. The rules of the ERM treated interventions that were carried out by the central bank with strong currency no other than a VSTF credit by the central bank with the weak currency. In other words, whenever the Bundesbank acquired franc deposits, it immediately transferred them to the BdF which was debited on its VSTF account. Correspondingly the Bundesbank was credited on its VSTF account. All accounts were denominated in ecu. All in all, for the BdF the intervention by the Bundesbank had the same effect as its own intervention, it created an increasing VSTF indebtedness. Again, in order to avoid insolvency, a policy adjustment (devaluation or interest rate increase) was required. For the Bundesbank, the increase in reserves did not necessitate any policy reaction. As far as the *liquidity effect* of the interventions was concerned, the Bundesbank had always been able to sterilise it fully so that it never lost the control over short-term interest rates which it used as its operating target. Thus, speculative attacks had never been a reason for the Bundesbank to relax its

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[5] After September 1997 (Bâle-Nyborg-Agreement) this period was extended to two months and a half.

monetary policy stance. However, as figure 6 shows they very often led to substantial increases of the short-term rates of the countries with weak currencies.[6]

If several empirical studies come to a less clear-cut result (von Hagen 1989), this is mainly due to the difficulty of testing this "asymmetry". For instance, if the correlation of national short-term interest rates is analysed, "asymmetry" can imply

- a *parallel movement* of the D-mark interest rates and the interest rates of other ERM countries. This has been the case in periods *without shocks* when the other countries mainly followed the Bundesbank's interest rate movements. As these central banks very often adjusted their rates almost immediately (i.e. often at the same day) after the Bundesbank, it is almost impossible to detect the true causality using monthly (and even daily) data.
- A *divergent movement* of the D-mark rate and the other ERM rates. This was the case when the other currencies were under a *speculative attack* and their central banks were forced to increase interest rates while the Bundesbank simply left its rates constant.

Thus, as far as the stabilisation of bilateral exchange rates in the short-term is concerned the system – in spite of its formal symmetry – implied a strong asymmetry which above all protected the Bundesbank from being infected with the relatively high inflation rates that prevailed in some of the other countries at least when the EMS started (see Table 3).

As far as the credit mechanism is concerned, it was obviously designed with the intention to provide unlimited funds for temporary speculative attacks, but to discourage the support of unsustainable exchange rate levels.

3.2 The role of the ecu currency basket

In the resolution of the European council of 5 December 1978 on the establishment of the EMS (see Appendix 2) a new currency unit, the ecu, has been created. It is composed of fixed absolute amounts of the currencies of all nine EC member countries which reflected the economic size of the member countries (see Table 1). The resolution states that the ecu

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[6] This is also confirmed by Gros and Thygesen (1998, p. 174).

"will be at the centre of the EMS" (Paragraph 2.1). It attributes four main functions to the ecu (Paragraph 2.2):

- "as a denominator (numéraire) for the exchange rate mechanism,
- as the basis for a divergence indicator,
- as the denominator for the operations in both the intervention and the credit mechanisms;
- as a means of settlement between monetary authorities of the European Community."

In practice, the ecu's role in the ERM remained very limited. While the parities were formally defined in terms of the ecu, all realignments were guided by the necessary adjustments of the bilateral rates (see Table 2). Thus, the new ecu rates were simply calculated on the basis of the agreed new bilateral rates. The *indicator of divergence* was intended as an *informal* intervention mechanism in addition to the parity grid. Its rationale was to create a unilateral intervention obligation for a currency that deviates from the *average* of all other currencies. This could have had the effect that the central bank of a currency that appreciates vis-à-vis all other currencies, above all the Bundesbank is obliged to intervene unilaterally. Eventually the Bundesbank might have been forced to pursue a more expansionary monetary policy. Because of its informal nature, this mechanism never played a role in ERM intervention policies. We will therefore skip the details.

As already mentioned, the operations in the intervention and credit mechanisms, above all the VSTF were denominated in ecu. For the forth function of the ecu each of the participating central banks had to provide 20 percent of the gold and dollar reserves to the European Monetary Co-operation Fund (EMCF) on a revolving basis. In exchange they obtained ecu assets with the EMCF which they could use to some extent for the settlement of credit balances.

3.3. Rules for realignments

The Council resolution of December 1978 remained rather vague about the concrete procedure for realignments (Paragraph 3.2):

"Adjustments of central rates will be subject to mutual agreement by a common procedure which will comprise all countries participating in the exchange rate mechanism and the Commission. There will be reciprocal consultation in the Community framework about important decisions concerning exchange-rate policy between countries participating and any country not participating in the system."

Thus, the resolution did not try to specify any concrete reason for a realignment. In practice, this discretionary approach worked very well. As Table 2 shows, realignments were decided rather frequently, especially in the first few years of the ERM.

4. The main achievement of the EMS: stable nominal exchange rate paths

4.1 The performance

At its Bremen Council of July, 6/7 1978 the European Council declared that a "zone of monetary stability in Europe" is "a highly desirable objective". In retrospect, one can say that the European Union has become both:

- a zone of monetary stability in terms of stable domestic price levels, and
- a zone of monetary stability in terms of stable exchange rates in the short-term and rather stable exchange rate paths in the medium term.

Figure 1 shows that the process to low inflation rates was not starting immediately in 1979. On contrary, as a consequence of the second oil price shock, inflation differentials vis-à-vis Germany increased in several countries, above all in Italy, Ireland and France. It is only the second half of the 1980s that allows to identify a significant improvement in inflation convergence.

In spite of the initial persistence of inflation differentials the ERM immediately contributed to a rather stable development of nominal exchange rates. As Figure 2 indicates, nominal D-mark exchange rates followed rather stable paths in the first years of the ERM until they - sooner or later - could be definitively kept stable. This immediate stabilisation is also confirmed by Table 4. The monthly variability of bilateral exchange rates de-

clined directly after the start of the ERM and it was considerably lower than the variability vis-à-vis non-ERM EU currencies and vis-à-vis the US dollar.

The *nominal* D-mark exchange rate paths that the ERM members targeted were associated with very different real exchange rate paths (see Figure 3). While France, Denmark and the Benelux countries maintained a relatively stable real exchange rate vis-à-vis the D-mark, Italy and Ireland experienced a massive real appreciation until the ERM crisis of 1992/93. While the strong nominal depreciation which followed the crises corrected this disequilibrium to some extent, the Lira entered EMU at a rather high real exchange rate which might be an explanation for the weak growth performance of the Italian economy in 1999. In the case of Italy and Ireland, it seems obvious, at least in retrospect, that these countries should have targeted a continuing nominal devaluation in the years 1987 to 1992 instead of targeting an almost stable nominal D-mark exchange rates. It is important to note that in the 1980s the real exchange rate variability of the D-mark vis-à-vis the US dollar was much higher than vis-à-vis the other ERM currencies. Thus, one can say that the ERM has contributed to real exchange rate stability too.

4.2 Interventions

The short-term stability of nominal rates was the result of an intensive intervention activity. Within the ERM two forms of interventions have to be differentiated:

- *marginal interventions* are carried out when a currency reaches its bilateral intervention point; they are also obligatory interventions since the participating central banks have to intervene whenever these points are reached;
- *intramarginal interventions* are carried out at the discretion of individual central banks already at exchange rate levels that are within the intervention points. ERM central banks made use of this option since the markets regarded an exchange rate at the intervention point as a signal of distress.

Table 5 shows that the intervention activity in the ERM was rather high throughout its whole lifetime. The data for selected periods that are available until 1979 only indicate that above all intramarginal interventions were applied to smoothen the path of nominal exchange rates. In the 1980s, marginal interventions remained relatively limited. This re-

flects the main objective of the ERM participants to allow for exchange rate adjustments that are required because of different national inflation rates. In the ERM crises of 1992/93 marginal interventions reached very high levels without being able to maintain the system in its original form. In 1993 and 1994 intramarginal interventions were very high which indicates the desire of the ERM members to keep exchange rate variations within lower limits than the ± 15 % band.

5. The ERM and the disinflation process in Europe

As the ERM started in a period of rather high inflation rates in most of its member countries, while the German (and Dutch) inflation rate were relatively low, many economists regarded the ERM mainly as a device for a disinflation with low macroeconomic costs. It was above all a paper by Giaviazzi and Pagano (1998) that stressed the advantages "of tying one's hands" by a credible commitment to an exchange rate peg vis-à-vis the D-mark. But at first sight, the high frequency of realignments in the 1980s (Table 2) does not indicate that the ERM parities were regarded as a binding constraint by national policy makers.

For a theoretical assessment of the disinflation processes in the 1980s and 1990s it is important to keep in mind that a relatively open economy has always two levers which it can use for that purpose:

- the domestic real short-term interest rate which affects the economy via the aggregate demand channel,
- the real exchange rate which affects the economy mainly via its effects on the profitability of enterprises; a real depreciation (appreciation) lowers (increases) domestic costs compared to the costs of foreign competitors. When enterprises apply a pricing-to-the market-strategy such changes in costs will have to be reflected in profit margins.

As Figure 4 and Figure 5 show, Italy and France experienced a massive real appreciation in the first three years of the ERM. However, as short-term real interest rates were negative, the stimulating effects through the aggregate demand channel overcompensated the dampening influence of the real appreciation. As a result the inflation rate increased until

1981. Only a strong increase in nominal and real short-term interest rates initiated a definitive disinflation process. Figure 6 shows that a similar development of real short-term interest rates can be observed in all ERM countries. The only major exemptions are Germany and in the Benelux countries where real short-term rates were always positive. It is important to note that during the disinflation period France targeted a real depreciation so that the ERM was exerting a stimulating effect. In Italy (and in Ireland), the real appreciation continued after 1981 so that the disinflation was based on both levers.

Thus, the academic discussion in the late 1980s has obviously overrated the importance of the ERM as a disinflation device. Most of the disinflation was achieved by the domestic lever of high real interest rates. In fact with a relatively low share of ERM trade in the GDP above all of France and Italy (see Table 3), such an effect cannot be very strong. This observation is in line with the results of empirical studies that show that the "sacrifice ratio" (i.e. the change of inflation over the change in unemployment for a given period) for the ERM members' disinflation was not lower than in other countries:

"Overall the evidence does not suggest that the EMS 'follower' countries paid a lower price in terms of unemployment for each percentage point of disinflation. For some sub-periods they did better than the rest of Community, but for others they did worse." (Gros and Thygesen, 1998, p. 147).

6. The weaknesses of the ERM

So far, we have described the ERM as an efficient mechanism for stabilising nominal exchange rates in the short-term and real exchange rates in the medium-term even in an environment with little domestic macroeconomic stability. But the ERM crises of 1992/93 are a clear signal that this system did also have some major defects. In our view they are above all related to three factors:

- The difficulty of achieving the right balance of domestic stabilisation and exchange rate stabilisation; it was above all Italy which adopted an obviously unbalanced strategy in 1987
- The dominance of the Bundesbank as the central bank with the lowest inflation and interest rate

- The contagion effects of a currency crises which lead to speculative attacks on countries with sound economic fundamentals.

6.1 How Italy violated the dual requirements of interest rate and exchange rate stabilisation

We have seen that all ERM member countries pursued a disinflation policy that relied not only on the participation in an exchange rate mechanism but also to a large degree on high real interest rates. As the "inconsistency triangle" shows, many currency crises are the result of an inconsistent setting of domestic interest rates and exchange rate targets. This interrelationship can be explained as follows.

If a central bank uses the interest rate together with the exchange rate channel for a policy of disinflation, its overall policy stance can be described by a *monetary conditions index* (MCI):

$$(1) \qquad MCI = (i-\pi) - \delta\Delta r^T ,$$

which is defined as the difference between the real interest rate and the real exchange rate target $\delta\Delta r^T$, i is the short-term interest rate, π the inflation rate and r is the logarithm of the real exchange rate. The latter is defined as:

$$(2) \qquad \delta\Delta r^T = \delta\Delta s^T + \pi^* - \pi;$$

where s is the logarithm of the spot exchange rate and π^* the anchor currency inflation rate. This standard formulation of the MCI assumes that a constant real exchange change rate has a neutral aggregate demand effect on the domestic economy.

In the open economy, one can define a Taylor-rule for the monetary conditions index as follows:

$$(3) \qquad MCI = R + \beta(\pi-\pi^T) + \gamma(y-y^P)/y^P \qquad \text{with } \beta, \delta, \gamma > 0$$

where R describes the average real interest rate. Equation (3) can be formulated as

$$(4) \qquad i = R + \pi + \beta(\pi\text{-}\pi^T) + \gamma(y\text{-}y^P)/y^P + \delta\Delta r^T \qquad \text{with } \beta, \delta, \gamma > 0.$$

According to this rule, the target for the domestic short-term interest rate i is calculated as the sum of an average real interest rate R plus the actual inflation rate π, the weighted difference between the actual inflation rate and the target inflation rate π^T, the weighted output gap and the target for the real exchange rate. For the sake of simplicity we assume that in the home and the anchor country the output gap is zero, that the anchor currency has no inflation problem, and that R is identical in both countries. Thus the interest differential becomes:

$$(5) \qquad i\text{-}i^* = \pi\text{-}\pi^* + \beta(\pi\text{-}\pi^T) + \delta\Delta r^T$$

or

$$i\text{-}i^* = \pi\text{-}\pi^* + \beta(\pi\text{-}\pi^T) + \delta\Delta s^T + \delta(\pi^* - \pi)$$

or

$$i\text{-}i^* = (1\text{-}\delta)(\pi\text{-}\pi^*) + \beta(\pi\text{-}\pi^T) + \delta\Delta s^T$$

with i* as the foreign short-term interest rate. Any combination of interest rate and exchange rate policy has to be compatible with the UIP equation:

$$(6) \qquad \Delta s^T + \alpha = i\text{-}i^*,$$

where α is the risk premium on the expected depreciation. Inserting equation (3) the equilibrium condition turns into:

$$(7) \qquad \Delta s^T + \alpha = (1\text{-}\delta)(\pi\text{-}\pi^*) + \beta(\pi\text{-}\pi^T) + \delta\Delta s^T$$

The intuition of this equilibrium condition is quite simple: A central bank can use domestic interest rates for disinflation only to the extent that the foreign exchange market demands a sufficiently high risk premium for the domestic currency at the given exchange rate target. In other words, strong capital inflows are a signal that a central bank is fol-

lowing a restrictive interest policy which is incompatible with an equilibrium on international financial markets.

This "disinflation-adjusted uncovered interest parity condition" can now be used to analyse two different exchange rate strategies of Italy in the ERM.

- In the period from 1979 to 1987 the lira was regularly devalued in nominal terms vis-à-vis the D-mark (see Table 2). Nevertheless, over the whole period the real exchange appreciated substantially (see Figure 3).
- From the end of 1987 until August 1992 the nominal exchange rate of the lira remained almost stable; in August 1992 the nominal lira D-mark rate was only 2.8 % lower than in November 1987. The realignment that took place on 8 January 1990 (Table 2) was only of a technical nature. It was required to implement the narrowing of the lira's fluctuation margin from ± 6 % to ± 2.25 %.

This switch in Italy's exchange rate policy lead to serious problems for the ERM. For an equilibrium on the foreign exchange market a constant nominal exchange rate target would have required that the lira interest rate equals the D-mark interest plus a risk premium. Figure 7 shows that in the years 1988 to 1991 the Banca d'Italia set its nominal interest rates very close to the values of a traditional Taylor rule. In addition there was also some restrictive monetary pressure because of the continuing real appreciation. However, at the same time D-mark interest rates were considerably lower. Thus, an equilibrium on international financial markets would have required a high risk premium. But as Figure 8 shows, the markets regarded the Lira now as a relatively stable currency so that the interest rate differential lead to huge capital inflows. In this respect, the Italian economy was in a similar situation as the Czech Republic in the years 1993 to 1996 and the Asian countries before the 1997 crisis.

The combination of strong short-term capital inflows and a continuing real appreciation was clearly unsustainable. It led directly to the ERM crisis of autumn 1992 which forced Italy to withdraw from the ERM until 1996. As the foreign exchange reserves of Italy show (Figure 9), the peak of the inflows was reached in spring 1991 so that the outburst of the crisis could have identified long before August 1992.

It is important to note that in the first few years of the ERM, no major inflows to Italy had occurred. At that time the interest rate differential vis-à-vis the D-mark was also rather high but as the Lira depreciated continuously in the wide band the risk premium was sufficiently high to deter destabilising short-term inflows.

The lessons of flawed Italian exchange rate strategy in the period from November 1987 to August 1992 can be explained in more general terms as follows.

For a constant nominal exchange rate $(\Delta s^T = 0)$ equation (6) becomes:

$$(7) \qquad \alpha = (1-\delta)(\pi-\pi^*) + \beta(\pi-\pi^T).$$

Thus, an UIP equilibrium can be maintained (or capital inflows can be avoided) only under three conditions:[7]

- if the inflation differential vis-à-vis the anchor currency $(\pi-\pi^*)$ is rather small and if at the same time the need to disinflate $(\pi-\pi^T)$ is not very high,
- if the risk premium is very high,
- if a country is so small that monetary policy can mainly rely on the exchange rate channel, i.e. δ is very high.

In the case of Italy in the period 1988 to 1992 the inflation differential to Germany was obviously higher than the risk premium that was demanded by foreign exchange markets. Thus, in an ERM-type system it seems reasonable to switch to a policy of constant nominal exchange targets only if the inflation differentials become relatively small. The ERM experience indicates that successful nominal exchange rate stabilisation requires an inflation differential of less than 4 percent (see Table 6).

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[7] The third condition is compatible with the observation that most countries which were able to maintain a fixed nominal exchange for longer periods of time are typically very small countries (Jadresic et al. 1999, p. 24). The second condition explains why a constant exchange rate target can be useful policy tool in the early stages of a macroeconomic stabilisation strategy (Bofinger 1996). After a period of very high and volatile inflation and a low credibility of policy-makers, the markets will not immediately be convinced that the new regime is sustainable. Thus, the risk premium can be very high. But as soon as the risk premium declines, an exit strategy is needed (Eichengreen and Masson 1998).

For Italy, the adequate strategy in the period 1988 to 1992 would have been a continuing nominal depreciation. As this would have caused more expansionary monetary conditions a somewhat higher nominal interest rate would have been required. As the parameter δ is normally in the order of 0.2 a 4 % depreciation would have required an increase in interest rates of 0.8 percentage points.

6.2 How the ERM was dominated by the Bundesbank

As already mentioned, the intervention rules of the ERM were designed in an asymmetric way. Thus, if a central bank wanted to target a constant nominal rate vis-à-vis the D-mark it was always obliged to bear the burden of adjustment whenever its currency was under a devaluation pressure. This asymmetry became a severe burden for the whole system when the Bundesbank started a restrictive monetary policy in 1989 and additionally tightened its policy stance in 1990/91 in order to limit the inflationary risks of German unification. This German monetary restriction was transmitted to the other ERM countries via the UIP condition. The main lever for this transmission was the general perception during the whole ERM period that the D-mark would never be devalued vis-à-vis another ERM currency. In almost all years this was clearly justified by the fact that until 1991 Germany (together with the Netherlands) had always the lowest inflation rate in ERM (see Figure 1). Thus, it becomes clear from equation (5) that the D-mark interest rate set a floor for the nominal interest rates of all other countries.

As a result, some of these countries were forced to maintain their interest rates at a level which was much too restrictive. This can be illustrated with a Taylor rate for France (Figure 10). According to the Taylor rate, Franc interest rates could have been lowered after 1989. However, the Banque de France was forced to keep its rates always above the D-mark threshold. Thus, it imported the German monetary restriction although there was no reason for such a policy stance in France. Of course, this problem could have been avoided if the inflation risks of German unification would have led to the expectation of a possible depreciation of the D-mark.

With the exception of Italy for all other founding ERM countries German dominance had the same implications. Their Taylor rate was much lower than their actual short-term in-

terest rate (Table 7). The enormous macroeconomic costs of such an unnecessary monetary restriction are one of the most important arguments for the substitution of the de facto monetary union of the ERM by a the fully-fledged European Monetary Union. As the monetary policy of the European Central Bank shows, in this arrangement the stance of overall monetary policy is set according to the economic situation in the whole currency area and not according to the conditions of the dominant country. In other words: the problem of the ERM was a common monetary policy that was determined by purely German macroeconomic data.

It is not clear whether a similar dominance of a single currency would necessarily occur in an ERM-type system. Given the rules of the ERM the reasons for the D-mark hegemony were due to

- the size of the German economy, and
- the very low inflation rate of Germany.

The country size alone could not have explained the dominance since at that time France and Italy were not significantly smaller in terms of population and GDP than Germany. The inflation rate by itself would not have been sufficient for dominance since for a small country (e.g. the Netherlands) it would have been very difficult to sterilise the expansionary liquidity effects of large foreign exchange market interventions.

In the present situation with very low inflation rates in almost all countries of the world, it seems less likely that in an ERM-type system a similar hierarchy of currencies and an associated stability of the sign of expected exchange rate changes would emerge.

6.3 The problem of contagion effects

The problems of an overly restrictive monetary policy that emerged in the years 1989 to 1991 became even more serious in the periods of the ERM crises of 1992/93. While the strong real appreciation of Italy and Ireland (Figure 3) clearly warranted a nominal depreciation, the situation in France was less clear-cut. Its real bilateral D-mark exchange rate showed an appreciation of about 15 % in 1992, but the country had been able to cope with

such a level since 1985. With the exception of the unemployment rate all other macroeconomic fundamentals were at least as good as in Germany (Table 8). Nevertheless, the ERM crises which was fundamentally a lira and Irish pound crisis immediately affected the French franc.

As the French government was not willing to devalue the Franc, the Banque de France could only defend the franc by a policy of additional monetary restraint (Figure 11). Otherwise, it would have incurred the risk of excessive settlement obligation in the VSTF. As a result, the difference between Franc interest rates and a Taylor rate which was already high in 1991 increased in 1992 and 1993. The result was very little real GDP growth in 1991 (+0.8 %) and 1992 (+1.2 %) and a recession (-1.3 %) in 1993. The unemployment rate increased from 8.9 % in 1990 to 11.7 % in 1993. The fiscal deficit increased from 1.6 % of GDP in 1990 to 6.1 % in 1993.

Such contagion effects constitute a difficult dilemma for the design of any fixed exchange rate system. In the ERM the easiest way to cope with an "unwarranted" speculative attack would have been a temporary suspension of the asset settlement obligations in the VSTF. This would have implied that the Banque de France would have been able (together with the Bundesbank) to defend the Franc against the D-mark without any budget constraint. Thus, there would have been no need to raise the Franc interest rates above the D-mark rates. This suspension of the asset settlement would have had no negative implications for both central banks, as long as they would have been able to sterilise the liquidity effects of the interventions. In the 1990s the Bundesbank's sterilisation potential was limited to the amount of its credits to the domestic banking system and the issuance of short-term notes up to DM 50 billion. Therefore, an unconditional commitment to defending the franc/D-mark rate could have led to a complete exhaustion of the Bundesbank's sterilisation potential. As the ECB's toolbox shows, a simple solution to this problem is the establishment of a *deposit facility*. It allows to absorb excess liquidity without any quantitative limit.

But the suspension of asset settlement obligation is not without risks. The discussion of the adjustment obligations in the ERM (section 3.1) has shown that this obligation normally functions as an important disciplining device for central banks that follow inflationary policies. In other words, without the asset settlement the inflationary policy stance of

the Banca d'Italia and the Banque de France in the early 1980s could have infected the whole ERM area. Thus, it is not advisable to establish a fixed-rate system without an asset settlement obligation.

A possible solution to this dilemma is a contingent suspension of the asset settlement obligation. It would imply that the asset settlement can be suspended when a country meets certain macroeconomic criteria. As the case of France in 1992 demonstrates, such criteria could above all include the inflation rate, the fiscal policy stance and the current account situation. [8]

7. Inertial Inflation and Wages in Europe on the Way to Monetary Union

Why had the inflation performances of the European countries been so different in the course of the 80s? Why did it take more than a decade in Italy but only two years in Germany to bring inflation back to tolerable levels after the second oil price explosion? Which factors explain the average performance of France in this respect and the excellent one of the Netherlands? Previous chapters have shown that the impact of monetary policy alone cannot explain the inflation outcome. While monetary policy had been restrictive all over Europe after the oil price explosion of 1979/80, demand side policy had been much more expansive in Germany mainly in the second half of the 80s compared to France or Italy. Obviously there must have been factors on the supply side of the economy responsible for the long lasting stickiness, for inertial inflation in these countries. These factors forced monetary policy makers to put on the monetary screws much more and much longer than in Germany to bring about the degree of monetary (nominal) convergence needed for a successful pegging of nominal exchange rates in the 90s.

The supply side, obviously, means the cost level of the economies under consideration. If overall costs are higher and more sticky in one country, a stronger impact of monetary policy is required to achieve the same result regarding inflation. In modern, vertically integrated economies there is only one intermediary good which is not produced at a certain stage of the production process. This is labor as a whole. Thus, for large

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[8] A detailed proposal for this solution can be found in Collignon et al. (1994).

relatively closed economies nominal unit labor costs prove to be by far the most important cost component. Unit labor costs for this type of country are highly correlated with the rate of inflation (Figure 12). The rate of inflation (p) is determined by the growth rates of nominal wages (w) and the growth rate of the mark–up (u) on the one hand and the growth rate of labor productivity (μ) on the other hand: p = (w + u) - μ

If the mark–up is constant over time, i. e., there are no changes in income distribution between labor and capital, prices are determined by unit labor costs (w – μ) and nothing else.

If in such an environment nominal wages are rigid downwards, which means slow to react to rising unemployment, monetary policy has to tighten more than in case of a quick and strong reaction of nominal wages, given a stable trend of productivity growth. For demand side policies like monetary policy to succeed in stimulating growth, rigid nominal wages relative to employment are the most important ingredient too. But there is another aspect of the rigidity of nominal wages: Nominal wages may be rigid or flexible relative to the overall price level in case of supply side shocks. If nominal wages are rigid in this respect too real wages are flexible when prices change as a result of supply shocks. Thus, the rigidity of wages proves to be a tricky phenomenon. Rigidity of wages is often blamed as being one of the main hindrances to a flexible response of labor markets in Europe. But the case of a supply side shock confuses traditional concepts of rigidity. Neoclassical theory expects real not nominal wages to be flexible. But for real wages to be flexible nominal wages have to be sticky – if prices are flexible.[9]

Thus, sticky nominal wages are clearly desirable for demand side policies as well as in cases of supply side shocks. If commodity prices rise due to falling supply ("oil") and

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[9] Flexible nominal wages are superior to sticky ones only under conditions of negative demand shocks and „rational expectations" concerning future anti-inflationary measures of monetary policy. In this case a quick reaction of nominal wages and prices can help to avoid rising real interest rates and restrictive effects on output and employment. But a symmetric reaction of nominal wages in case of an expansionary monetary policy, i. e. a positive demand shock would lead to the same result, namely only a small reaction of output and employment. This time, however, the result is inferior to sticky nominal wages. Thus, monetary policy should rely on monetary policy and not on the replacement of monetary policy by „monetary management by the trade unions", as Keynes once had called it.

(rigid) money wages do not react, the shock is absorbed without inducing an inflationary spiral. If nominal wages are flexible (vary with prices), however, the effects of a supply shock will either increase inflation or will reduce demand and investment as soon as monetary policy tries to avoid an acceleration of inflation or even the once and for all increase of the inflation rate. Thus, nominal rigidity of wages is the preferable regime in a world which is bombarded by positive and negative real shocks (see Figure 12 and 13).

Nominal wage flexibility and thus real wage rigidity, however, was the regime with which some of the big countries in Europe had come out of the two oil price explosions. In France and Italy at the beginning of the 80s schemes of backward looking indexation were the dominant feature of the labor market. In this case very flexible nominal wages, i.e., nominal wages being a function of past prices (the case of backward-looking indexation) lead to a very high degree of real wage rigidity. Under these circumstances restrictive monetary shocks will have grave consequences as prices react with a long delay to the fall in demand. Negative supply shocks will not be absorbed but lead to more inflation.

The important exception in continental Europe at the beginning of the 80s was Germany. Like the United States Germany was successful in bringing unit labor costs and inflation rates down almost immediately after the end of the oil price hike (Figure 14). Second in Europe was a group of countries which are called the "Fix Rate Group". This group consists of the Netherlands, Belgium, Denmark, Austria and France. This group managed to keep up with Germany in the second half of the 80s.

Given the German and the US example, other countries even outside the "Fix Rate Group" quickly learned that inflation was not the solution to the emerging labor market problems in the aftermath of a supply shock. But the institutional arrangements on the labor market which had been created to shelter employees from the negative repercussions of the loss in real income, couldn't be dissolved quickly for political reasons. In consequence, instead of a quick dissolution of the inflexible labor market regimes (which means to dissolve nominal flexibility and to reinstall nominal rigidity), the answer was harsh monetary restriction. The result was an extremely long period of disinflation with the final conversion to the German and the US level of unit labor costs and inflation at the beginning of the 90s only (Figure 14). The price which had to be paid was much higher unemployment in France

and Italy than in West Germany and in the United States before the recession of 1991/1992 (Figure 13)[10].

Pertinent to the understanding of the process are the cases of the Netherlands and France in comparison to West Germany (Figure 15). For both members of the "Fix Rate Group" the development of unit labor costs in Germany obviously was the reference line, the "anchor" as it was for all the other countries aiming at the membership of the EMS and the EMU later. German unit labor costs at this time rose – by and large – by 2 % annually throughout the 80s. France didn't manage to get its wage policy to follow this line up until the second half of the 80s and fixed its exchange rate irrevocably vis-à-vis Germany only in 1987. The Netherlands adopted quite a different approach: After a huge inflationary bubble during the 70s and an unemployment rate which doubled the German one in 1982 (Figure 12) the Dutch government adopted a new regime of labor relations. Under the supervision of the government wage policy agreed to a moderation of nominal wage increases even below the German rates, given the different national productivity trends. The real exchange rate of the Netherlands was devalued as the nominal rate was fixed to the D–Mark. By this "beggar–thy–neighbour" approach the Netherlands economy gained overall competitiveness and won market shares all over Europe whereas the high inflation countries struggled as regards domestic as well as foreign demand.

It is important to note that the successful non–monetary moderation of inflation was achieved in Europe in countries with highly centralized processes of wage bargaining like Germany and the Netherlands. But, in stark contrast, a country with a highly decentralized labor market like the United States was able to compete with the most successful European approaches regarding the adjustment to the supply shocks, i. e. nominal wage rigidity and real wage flexibility, given more or less the same monetary policy stance, in the course of the 80s. Thus, the US could have fixed their rate vis-à-vis Germany as soon as the Netherlands and much earlier than France. The fact that Germany and France were much less successful regarding their labor market performance throughout the 90s seems to be a different story as the Netherlands decoupled from Germany since 1992 in terms of overall unemployment. Surprisingly enough this was not the result of an ongoing moder-

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[10] To be clear concerning the explanation of unemployment in France and Italy: It was not „neoclassical" unemployment due to too high real wages but rather „keynesian" unemployment due to too high real interest rates. The reaction of real wages relative to unemployment (the wage share) was, in the course of the 80s, as flexible in France and Italy as in Germany and much more flexible than in the United States where real wages hardly ever lagged behind productivity.

ating of wages vis-à-vis Germany but of the opposite, namely higher growth rates of unit labor costs and an acceleration of domestic demand.

The lesson to be learned from the European labor market developments since the adoption of the idea to have a common currency is a rather simple one: Countries with very different labor market regimes can join a system of fixed or quasi–fixed exchange rates if they are able to adjust their unit labor cost developments to the development of unit labor costs in the majority of the other countries. Any system is free to choose a growth path of unit labor costs which will then determine the inflation rate or to fix the inflation rate and let nominal wages adjust to this inflation target, given a stable trend of productivity growth. The transition to such a low inflation performance which is backed by a sufficient degree of nominal wage rigidity and real wage flexibility can be very costly, however. Any country to join a system which includes already successful countries should check the possibilities to alter its labor market regime in time to avoid major blows to its economic targets and the stability of the whole system. If, e.g., Italy would have been able to abandon the "scala mobile", its scheme of backward–looking indexation at a much earlier point of time the adjustment costs for everybody in Europe could have been remarkably diminished.

8. Conclusions

Today the mainstream view which favours either completely fixed exchange rates or flexible exchange rates is not very sympathetic to fixed exchange rate regimes like the EMS. However, both corner solutions are not always very attractive. The instability of freely floating exchange rates is obvious. As it renders macroeconomic control very difficult for smaller economies, in such countries a pure floating, in the sense of a total abstinence of exchange market intervention, is very rare. A complete fixing of nominal exchange rates is not an ideal solution as well. As domestic interest rates are completely exogenous, no domestic lever for macroeconomic stabilisation is available. In addition, there is always a risk of speculative attacks which requires high real interest rates. Thus, in this solution a country is confronted the main disadvantage of a monetary union without enjoying its benefits.

The ERM experience shows that a regional exchange rate system constitutes a good compromise between free floating and an international exchange rate system which is not very realistic at the moment. Of course, such a regional solution is only worthwhile, if the participants have relatively strong trade linkages. While the overall framework of the ERM (with ± 2.25 % bands) seems suitable without major modifications, it seems important to avoid the main mistakes of the ERM:

(a) In a situation with major inflation differentials, a timely adjustment of nominal rates is required in order to avoid a real appreciation and speculative capital flows.

(b) If the system is dominated by the policy of a major economy, it seems necessary to achieve a co-ordination of national monetary policies that is geared to the overall macroeconomic situation of the whole currency area.

(c) In a situation with speculative attacks that have no fundamental justification it seems useful to suspend the asset settlement obligations for the country with weak currency. This avoids increases in short-term interest rates which have negative macroeconomic effects and which make the defence of the system unsustainable.

It may not be easy to formulate such contingencies in the rules of an exchange rate arrangement. As the rules (b) and (c) weaken the disciplining effects of an exchange rate regime, it will be easier to implement them in a group of countries with a strong preference low inflation.

The EMS shows that in the longer-term such a regional exchange rate arrangement has the additional advantage that it can be developed into a fully-fledged monetary union.

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Appendix 1: The history of European monetary integration

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1 JANUARY 1958: The Treaty of Rome states (art. 2) that the Community shall have as its task, by establishing an economic and monetary union, to promote throughout the Community a harmonious and balanced development of economic activities. Creation, by the Treaty, of the Monetary Committee and the European Investment Bank.

17 JULY 1969: The Council adopts a decision on the co-ordination of the Member States' short-term economic policies.

1/2 DECEMBER 1969: The Community Summit in The Hague sets up a High Level Group under the Luxembourg Prime Minister, Pierre Werner, to report on the possibilities of developing the Community into an economic and monetary union.

22 MARCH 1971: The Council adopts the Werner Plan to strengthen co-ordination of economic policies. The Member States commit themselves to harmonise their budgetary policies and reduce the margins of fluctuation between their currencies.

21 DECEMBER 1971: Smithsonian Agreement widens the fluctuation margins of the Bretton Woods exchange rate system to ± 2.25 %. This implies margins between the non-dollar currency of ± 4.5 %.

10 APRIL 1972: Bâle Agreement sets up the "snake": the Six agree to limit the margin of fluctuation between their currencies to ± 2.25%. The number of Member States that par-ticipate and then withdraw varies over time.

19/20 OCTOBER 1972: The Paris Summit, meeting the Heads of State or Government reaffirms the 1980 deadline for the achievement of economic and monetary union.

3 APRIL 1973: Creation of the European Monetary Co-operation Fund (ECMF).

18 MARCH 1975: The Council adopts a European unit of account (EUA) based on a composite basket of the Community currencies. It will be used initially under the Lomé Convention and for European Investment Bank operations and will later be introduced gradually into other sectors of Community activity.

29 DECEMBER 1975: Belgian Prime Minister Leo Tindemans presents his report on European Union which proposes a series of goals including an economic and monetary union.

27 OCTOBER 1977: The President of the Commission, Roy Jenkins, makes a statement in Florence on the prospects for monetary union.

6/7 JULY 1978: The European Council meeting in Bremen agrees the French-German proposal to launch the European Monetary System (EMS).

13 MARCH 1979: The EMS comes into force; the eight participating Member States (the United Kingdom stays outside) are required to maintain their exchange rates within certain fluctuation margins. Creation of the European currency unit (ECU).

10 JUNE 1985: Committee of Governors of Central Banks of Member States adopts measures designed to strengthen EMS.

1 JULY 1987: The Single European Act, which reforms the EEC Treaty, comes into force. Its objective is the completion of the frontier-free market by the end of 1992.

27/28 JUNE 1988: The Hanover European Council appoints a committee of experts (chaired by Jacques Delors) to examine ways and means of completing economic and monetary union.

12 APRIL 1989: Delors Committee presents report on economic and monetary union.

19 JUNE 1989: Peseta enters EMS exchange-rate mechanism; composition of ecu adjusted following inclusion of peseta and escudo.

26/27 JUNE 1989: Madrid European Council adopts conclusions on economic and monetary union: the Heads of State or Government approve the Delors Report, and decide to begin the first stage of EMU on 1 July 1990.

8/9 DECEMBER 1989: Strasbourg European Council decides to convene an intergovernmental Conference before 1990 to draw up amendments of the Treaty for final stages of economic and monetary union.

1 JULY 1990: The first phase of the Economic and Monetary Union (EMU) comes into force. It involves the removal of most of the remaining restrictions on capital movements, increased co-ordination of individual economic policies and more intensive co-operation between central banks.

6 OCTOBER 1990: Pound sterling joins EMS exchange-rate mechanism.

14/15 DECEMBER 1990: Two Intergovernmental Conferences, one on Economic and Monetary Union, the other on Political Union, are launched by the European Council in Rome and result in the Treaty on European Union.

9/10 DECEMBER 1991: Maastricht European Council reaches agreement on draft Treaty on European Union: completion of economic and monetary union and introduction of the single European currency, the ecu, by 1999 at the latest.

4 APRIL 1992: Escudo enters EMS exchange-rate mechanism.

17 SEPTEMBER 1992: Pound sterling and Italian lira leave the EMS exchange-rate mechanism.

1 JANUARY 1993: The Single Market establishing the free movement of capital enters into force.

2 AUGUST 1993: Widening of the fluctuation margins of the exchange-rate mechanism of the EMS to ± 15 %.

1 NOVEMBER 1993: The Treaty on European Union enters into force.

1 JANUARY 1994: Stage II of economic and monetary union begins and European Monetary Institute (EMI) is established.

15 NOVEMBER 1994: European Monetary Institute Council meets for the first time in Frankfurt.

9 JANUARY 1995: The Austrian shilling joins the EMS exchange rate mechanism.

31 MAY 1995: The Commission adopts a Green Paper on the practical arrangements for the introduction of the single currency.

26/27 JUNE 1995: The meeting of Heads of State or Government held in Cannes confirms transition to a single currency by 1 January 1999.

10 JULY 1995: Council formally adopts broad economic policy guidelines and recommendations to 12 Member States with excessive public deficits.

15/16 DECEMBER 1995: Madrid European Council names the European currency unit "Euro" and confirms the introduction of single currency on 1 January 1999.

14 OCTOBER 1996: The Finnish Mark joins the EMS exchange-rate mechanism.

25 NOVEMBER 1996: Italian lira re-enters the EMS exchange-rate mechanism.

16/17 JUNE 1997: The European Council meets in Amsterdam and reaches a consensus on a draft Treaty. It approves various proposals facilitating the smooth passage to the third phase of the Economic and Monetary Union and adopts a resolution on growth and employment.

16 MARCH 1998: The Drachma enters the European Monetary System (EMS) exchange rate mechanism.

3 MAY 1998: A special Council decides that 11 Member States satisfy conditions for adoption of the single currency on 1 January 1999. Following this decision, the Council adopts two regulations on technical specifications of euro coins and introduction of the euro, the ministers and Central Bank governors of Member States adopting the euro as their single currency. The Commission and the European Monetary Institute set out conditions for the determination of the irrevocable conversion rates for the euro.

1 JUNE 1998: Establishment of the European Central Bank.

1 JANUARY 1999: The Euro is officially launched. Austria, Belgium, Finland, France, Germany, Ireland, Italy, Luxembourg, The Netherlands, Portugal and Spain adopt the Euro as their official currency.

Sources: European Union (internet: www. Europa.eu.int), Deutsche Bundesbank (1997).

Appendix 2: Excerpts from the resolution of the European Council of 5 December 1978 on the establishment of the European Monetary System (EMS) and related matters

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A   The European Monetary System

1   Introduction

    1.1   In Bremen we discussed a 'scheme for the creation of closer monetary co-operation leading to a zone of monetary stability in Europe'. We regarded such a zone 'as a highly desirable objective' and envisaged 'a durable and effective scheme'.

    1.2   Today, after careful examination of the preparatory work done by the Council and other Community bodies, we are agreed as follows:

    A European Monetary System (EMS) will be set up on 1 January 1979.

    1.3   We are firmly resolved to ensure the lasting success of the EMS by policies conducive to greater stability at home and abroad for both deficit and surplus countries.

    1.4   The following chapters deal primarily with the initial phase of the EMS.

We remain firmly resolved to consolidate, not later than two years after the start of the scheme, into a final system the provisions and procedures thus created. This system will entail the creation of the European Monetary Fund as announced in the conclusions of the European Council meeting at Bremen on 6 and 7 July 1978, as well as the full utilisation of the ECU as a reserve asset and a means of settlement. It will be based on adequate legislation at the Community as well as the national level.

2   The ECU and its functions

    2.1   A European Currency Unit (ECU) will be at the centre of the EMS. The value and the composition of the ECU will be identical with the value of the EUA at the outset of the system.

    2.2   The ECU will be used:

        (a) as the denominator (numéraire) for the exchange-rate mechanism;
        (b) as the basis for a divergence indicator;
        (c) as the denominator for operations in both the intervention and the credit mechanisms;
        (d) as a means of settlement between monetary authorities of the European Community

    2.3   The weights of currencies in the ECU will be re-examined and if necessary revised within six months of the entry into force of the system and thereafter every five years or on request, if the weight of any currency has changed by 25 per cent. Revisions have to be mutually accepted; they will, by themselves, not modify the external value of the ECU. They will be made in line with underlying economic criteria.

3   The exchange rate and intervention mechanisms

    3.1   Each currency will have an ECU-related central rate. These central rates

will be used to establish a grid of bilateral exchange rates. A member state which does not participate in the exchange-rate mechanism at the outset may participate at a later date.

3.2 Adjustments of central rates will be subject to mutual agreement by a common procedure which will comprise all countries participating in the exchange-rate mechanism and the Commission. There will be reciprocal consultation in the Community framework about important decisions concerning exchange-rate policy between countries participating and any country not participating in the system.

3.3 In principle, interventions will be made in participating currencies.

3.4 Intervention in participating currencies is compulsory when the intervention points defined by the fluctuation margins are reached.

3.5 An ECU basket formula will be used as an indicator to detect divergences between Community currencies. A 'threshold of divergence' will be fixed at 75 per cent of the maximum spread for each currency. It will be calculated in such a way as to eliminate the influence of weight on the probability of reaching the threshold.

3.6 When a currency crosses its 'threshold of divergence', the results in a presumption that the authorities concerned will correct this situation by adequate measures namely:

    (a) diversified intervention;
    (b) measures of domestic monetary policy;
    (c) changes in central rates;
    (d) other measures of economic policy.

In case such measures, on account of special circumstances, are not taken, the reasons for this shall be given to the other authorities, especially in the 'concertation between central banks'. Consultations will, if necessary, then take place in the appropriate Community bodies, including the Council of Ministers.

After six months these provisions shall be reviewed in the light of experience. At that date the questions regarding imbalances accumulated by divergent creditor or debtor countries will be studied as well.

3.7 A very Short-Term Facility of an unlimited amount will be established. Settlements will be made 45 days after the end of the month of intervention with the possibility of prolongation for another three months for amounts limited to the size of debtor quotas in the Short-Term Monetary Support.

3.8 To serve as a means of settlements, an initial supply of ECUs will be provided by the EMCF against the deposit of 20 per cent of gold and 20 per cent of dollar reserves currently held by central banks.
This operation will take the form of specified, revolving swap arrangements. By periodical review and by an appropriate procedure it will be ensured that each central bank will maintain a deposit of at least 20 per cent of these reserves with the EMCF. A member state not participating in the exchange rate mechanism may participate in this initial operation on the basis described above.

4   The credit mechanisms

4.1 The existing credit mechanisms with their present rules of application will be maintained for the initial phase of the EMS. They will be consolidated into a single fund in the final phase of the EMS.

4.2   The credit mechanisms will be extended to an amount of ECU 25 000 million of effectively available credit. The distribution of this amount will be as follows:
Short-Term Monetary Support = ECU 14 000 million;
Medium-Term Financial Assistance = ECU 11 000 million.

4.3   The duration of the Short-Term Monetary Support will be extended for another three months on the same conditions as the first extension.

4.4   The increase of the Medium-Term Financial Assistance will be completed by 30 June 1979. In the meantime, countries which still need national legislation are expected to make their extended medium-term quotas available by an interim financing agreement of the central banks concerned.

Table 1: The ecu currency basket

	Since 13. March 1979	Since 17. September 1984	Since 21. September 1989
D-Mark	0.8280	0.7190	0.6242
Pound Sterling	0.08850	0.08780	0.08784
French Franc	1.150	1.310	1.332
Italian Lira	109.00	140.00	151.80
Dutch Guilder	0.2860	0.2560	0.2198
Bel. Franc	3.660	3.710	3.301
Lux. Franc	0.14	0.14	0.13
Danish Krone	0.2170	0.2190	0.1976
Irish Punt	0.007590	0.008710	0.008552
Greek Drachma	-	1.15	1.44
Spanish Peseta	-	-	6.885
Port. Escudo	-	-	1.393

Source: Deutsche Bundesbank October 1999; Devisenkursstatistik

Table 2: Realignments in the ERM

Date	D-Mark	Bel/Lux franc	Danish krone	French franc	Irish punt	Dutch guilder	Italian lira	Spanish peseta	Pound sterling	Port. Escudo
24 September 79	+2.00	-	-2.86	-	-	-	-	NM	NM	NM
30 November 79	-	-	-4.76	-	-	-	-	NM	NM	NM
23 March 81	-	-	-	-	-	-	-6.00	NM	NM	NM
5 October 81	+5.50	-	-	-3.00	-	+5.50	-3.00	NM	NM	NM
22 February 82	-	-8.50	-3.00	-	-	-	-	NM	NM	NM
14 June 82	+4.25	-	-	-5.75	-	+4.25	-2.75	NM	NM	NM
21 March 83	+5.50	+1.50	+2.50	-2.50	-3.50	+3.50	-2.50	NM	NM	NM
22 July 85	+2.00	+2.00	+2.00	+2.00	+2.00	+2.00	-6.00	NM	NM	NM
7 April 86	+3.00	+1.00	+1.00	-3.00	-	+3.00	-	NM	NM	NM
4 August 86	-	-	-	-	-8.00	-	-	NM	NM	NM
12 January 1987	+3.00	+2.00	-	-	-	+3.00	-	NM	NM	NM
8 January 1990	-	-	-	-	-	-	-3.86	-	NM	NM
14 September 92	+3.50	+3.50	+3.50	+3.50	+3.50	+3.50	-3.50	+3.50	+3.50	+3.50
17 September 92	-	-	-	-	-	-	-	-5.00	NM	-
1 February 1993	-	-	-	-	-10.00	-	-	-	NM	-
14 May 1993	-	-	-	-	-	-	-	-8.00	NM	-6.50
6 March 1995	-	-	-	-	-	-	-	-7.00	-	-3.50

Source: Deutsche Bundesbank 1997; purely technical adjustments are not reported. NM: country does not participate in the exchange rate mechanism.

Table 3: The ERM founding countries in 1979

	Belgium	Denmark	Germany	France	Ireland	Italy	Luxem-bourg	Nether-lands
EU-member since	1957	1973	1957	1957	1973	1957	1957	1957
Population (in thousands)	9,870	5,120	61,337	53,480	3,365	56,910	360	14,030
Per capita income in % of average EU income	109.7	94.3	108.6	109.9	73.7	96.1	115.0	126.0
Inflation rate in %	4.5	9.6	4.1	10.8	13.3	14.8	4.5	4.2
Unemployment rate in %	7.5	6.2	3.2	5.8	7.1	7.8	0.7	3.6
Openness: ½ (exports + imports) in % of GDP	50.7	25.0	21.7	18.3	57.5	19.3	71.3	50.6
Share of ERM trade (exports + imports) in % of total trade	62.2	36.7	42.0	41.8	25.2	40.2	n.a	47.6
ERM trade (=1/2 exports + imports) in % of GDP	31.5	9.2	9.1	7.6	14.4	7.8	n.a.	23.9

Sources: OECD, Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung, Statistisches Bundesamt.

Table 4: Nominal exchange rate variability against ERM8 currencies

	1960-68	1969-78	1979-83	1984-87	1988-91	1992-95	1996
Average ERM8	0.24	1.16	0.78	0.54	0.39	1.00	0.64
Average non-ERM8 EC	0.62	2.09	2.73	1.89	1.43	2.14	1.55
USA	0.21	2.18	2.81	3.32	3.27	2.94	2.01

Source: Gros and Thygesen (1998). Variability is defined as the weighted sum of the standard deviation of changes in the monthly logarithm of monthly bilateral exchange rates (times 100). The weights are the implicit ecu weights derived from average exchange rates 1991.

Table 5: D-mark interventions in the ERM

 (in Bill. DM)

\+ = Deutsche Mark sales or expansionary impact on liquidity in Germany
 \- = Deutsche Mark purchases or contractionary impact on liquidity in Germany

	Period	Obligatory	Intra-marginal	Total
A.	By calendar years			
	1979 Purchases	-	2,7	2,7
	Sales	3,6	8,1	11,7
	Balance	-3,6	-5,4	-9,0
	1980 Purchases	5,9	5,9	11,8
	Sales	-	1,0	1,0
	Balance	+5,9	+4,9	+10,8
	1981 Purchases	2,3	8,1	10,4
	Sales	17,3	12,8	30,1
	Balance	-15,0	-4,7	-19,7
	1982 Purchases	-	9,4	9,4
	Sales	3,0	12,8	15,8
	Balance	-3,0	-3,4	-6,4
	1983 Purchases	16,7	19,1	35,8
	Sales	8,3	12,9	21,2
	Balance	+8,4	+6,2	+14,5
	1984 Purchases	-	28,9	28,9
	Sales	4,7	7,6	12,3
	Balance	-4,7	+21,4	+16,6
	1985 Purchases	-	29,1	29,1
	Sales	0,4	30,8	31,1
	Balance	-0,4	-1,6	-2,0
	1986 Purchases	19,0	33,6	52,6
	Sales	4,1	74,0	78,1
	Balance	+14,8	-40,4	-25,5
	1987 Purchases	-	47,8	47,8
	Sales	15,0	61,7	76,8
	Balance	-15,0	-13,9	-28,9
	1988 Purchases	-	26,8	26,8
	Sales	-	16,3	16,3
	Balance	-	+10,5	+10,5
	1989 Purchases	-	20,4	20,4
	Sales	5,0	8,6	13,6
	Balance	-5,0	+11,8	+6,8
	1990 Purchases	1,5	32,5	34,1
	Sales	-	12,3	12,3
	Balance	+1,5	+20,2	+21,8

1991	Purchases	-	6,4	6,4
	Sales	-	21,9	21,9
	Balance	-	-15,5	-15,5
1992	Purchases	-	75,1	75,1
	Sales	63,7	199,7	263,4
	Balance	-63,7	-124,6	-188,3
1993	Purchases	-	92,0	92,0
	Sales	25,1	166,0	191,1
	Balance	-25,1	-74,0	-99,1
1994	Purchases	-	52,6	52,6
	Sales	-	5,5	5,5
	Balance	-	47,1	47,1

B. <u>By selected periods, net</u>

21st March 1983 to 8th July 1985 From the first trading day after the realignment of 21st March 1983 to the end of major Deutsche Mark purchases by partner countries	-11,8	-49,8	-61,6
8th July 1986 to 9th January 1987 From the end of major Deutsche Mark purchases by partner countries to the last trading day before the realignment of 12th January 1987	+18,9	+44,1	+63,0
3th June 1992 to 25th September 1992 Deutsche Mark in ERM appreciated; Devaluation of partner currencies And exit of Pound and Lira	-63,7	-120,4	-184,2
26th September 1992 to 17th November 1992 Return of foreign exchange movements In the ERM	-0,0	47,7	47,7
8th July 1993 to 1st August 1993 More and more strength of Deutsche Mark In the ERM was following by widening of the band	-24,7	-82,4	-107,0
6th December 1993 to 5th December 1994 Calm in the ERM		52,3	52,3

Table 6: Nominal exchange rate stabilisation in the ERM

	Date of realignment (entry)	Inflation differential to Germany (averages of 6 months before and 6 months after realignment)	Interest differential to Germany (averages of 6 months before and 6 months after realignment)	Last realignment?
Netherlands	21.03.83	**-0.49**	0.30	**yes**
Denmark	12.01.87	**3.79**	5.84	**yes**
Belgium	12.01.87	**1.48**	1.87	**yes**
France	12.01.87	**3.15**	3.56	**yes**
Italy	12.01.87	4.25	7.33	no
	08.01.90 (technical)	3.53	5.09	no
	25.11.96	**1.50**	4.71	**yes**
Spain	19.06.89 (entry)	3.86	7.78	no
	06.03.95	**2.56**	3.68	**yes**
Portugal	06.04.92 (entry)	4.25	8.26	no
	06.03.95	**2.17**	4.28	**yes**
Greece	16.03.98 (entry)	**3.60**	/	**yes**
Sweden	17.05.91 (peg) [1]	8.10	3.27	no
Finland	14.10.96 (entry)	**-0.84**	0.14	**yes**
United Kingdom	08.10.90 (entry)	7.43	6.07	no
Austria	December 81 (peg) [2]	**0.12**	-0.76	**yes**

1) Sweden pegged its currency to the ECU from 17 May 91 – 19 November 92.
2) The last significant change of the Schilling/DM exchange rate took place between September 79 and the end of 81 (appreciation of the Schilling of about 4.5 %).

Source: IFS

Table 7: Taylor interest rates and actual short-term interest rates in 1991

Country	Taylor interest rate	Actual interest rate
Belgium	6.5	9.3
Denmark	3.0	9.7
France	5.8	9.6
Germany	8.9	9.2
Ireland	5.7	10.4
Italy	11.0	12.2
Netherlands	6.5	9.3

Taylor interest rate calculated with the original Taylor formula: $i= 2+\text{inflation rate}+0.5(\text{inflation rate} -2)+0.5$ (Output-gap). Data source: OECD, Economic Outlook

Table 8: Macroeconomic fundamentals in France and Germany (1992)

	Germany	France
Inflation rate	5.1	2.4
General government structural balance	-3.8	-3.6
General government gross financial liabilities	44.4	45.5
Current account balance	-1.0	0.4
Unemployment rate	7.7	10.4

Source: OECD, Economic Outlook

Figure 1: Inflation convergence in ERM countries
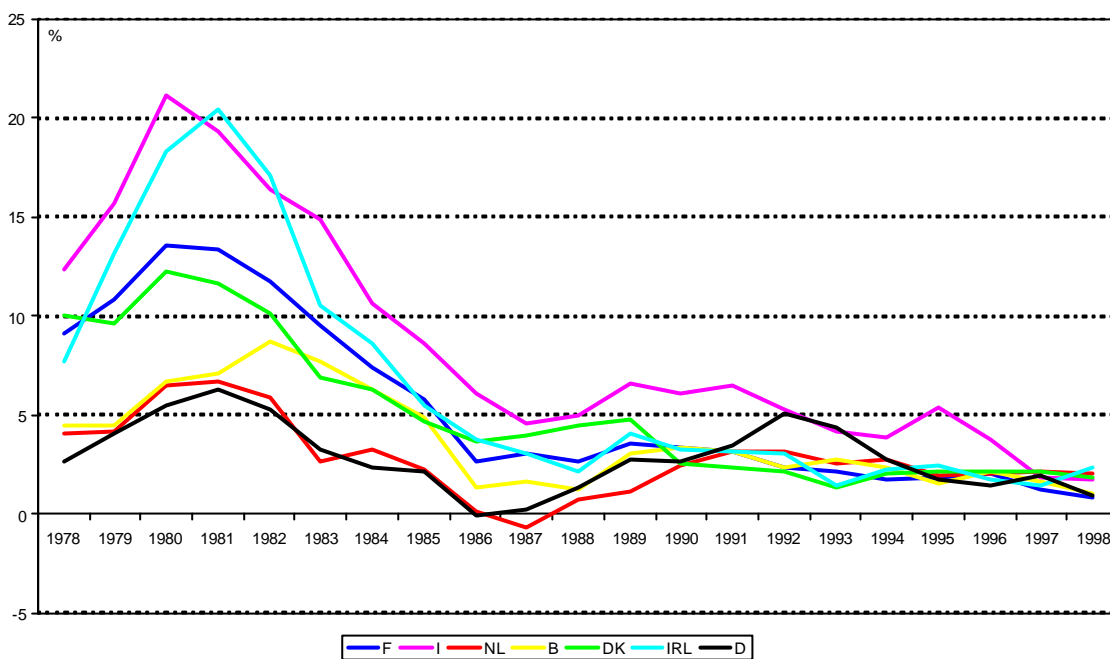
Source: OECD, Economic Outlook

Figure 2: The Path to Nominal exchange rate convergence
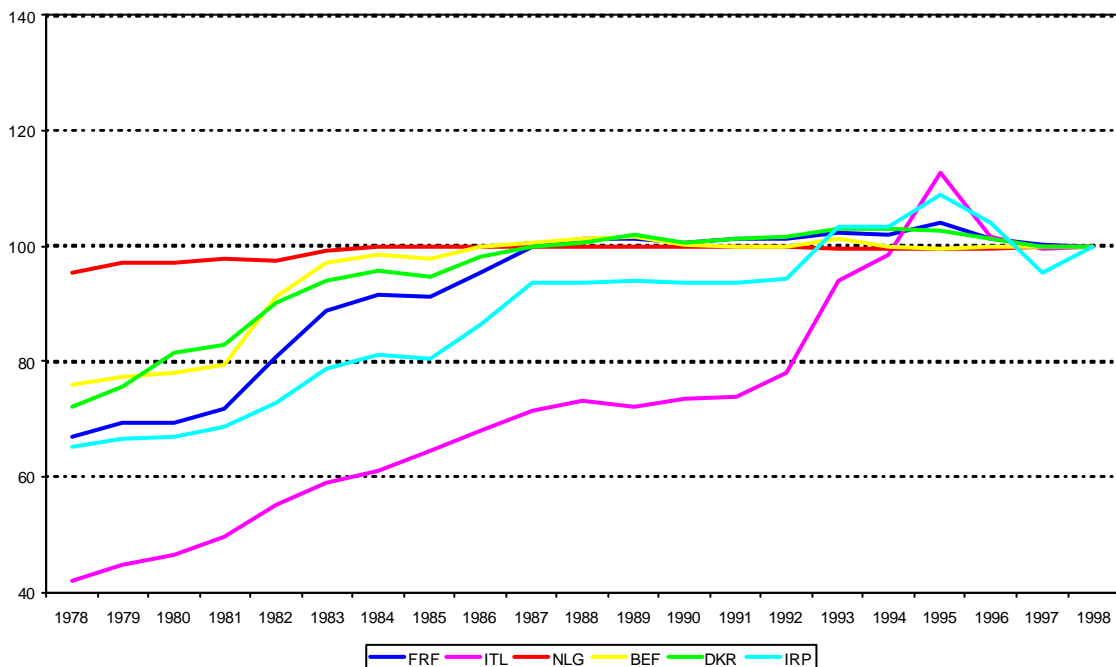
Source: OECD, Economic Outlook

Figure 3: Real bilateral DEM exchange rates
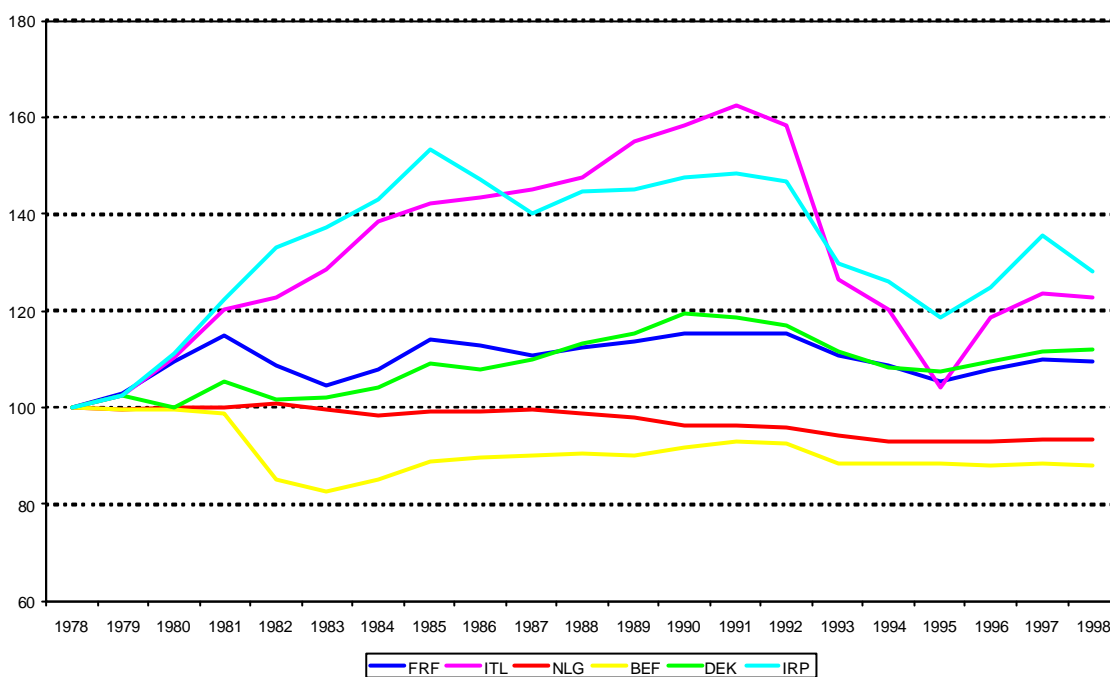
Source: OECD, Economic Outlook

Figure 4: Disinflation in France
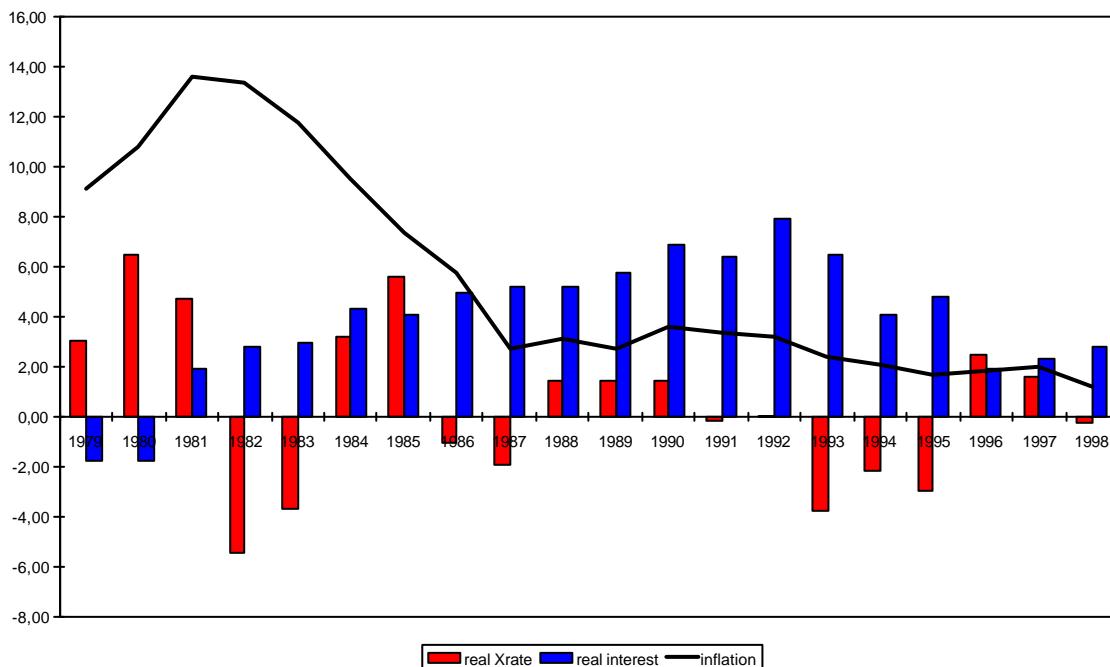
Source: OECD, Economic Outlook

Figure 5: Disinflation in Italy

real Xrate ■ real interest — inflation
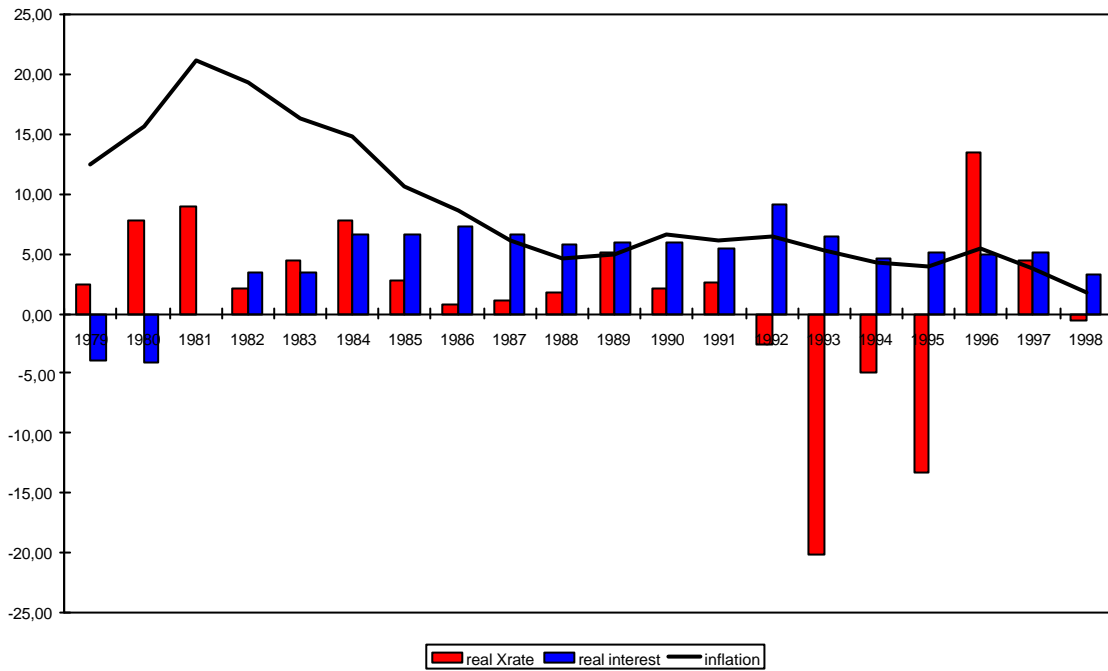
Source: OECD, Economic Outlook

Figure 6: Real short-term interest rates in ERM Countries

F I NL B DK IRL D
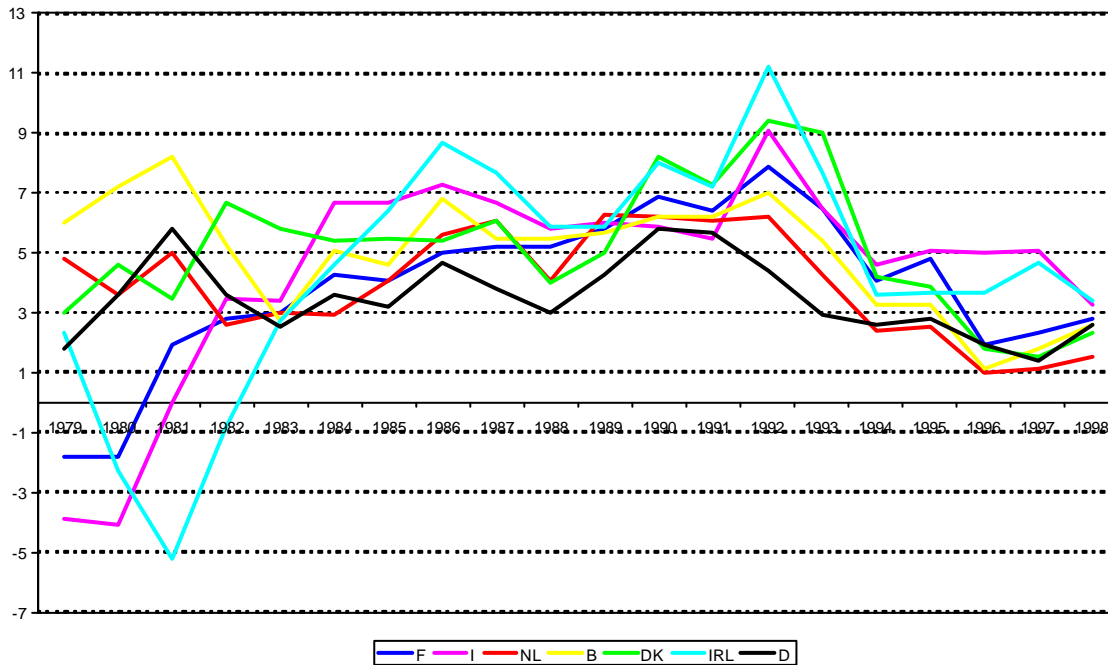
Source: OECD, Economic Outlook

Figure 7: Taylor interest rate for Italy
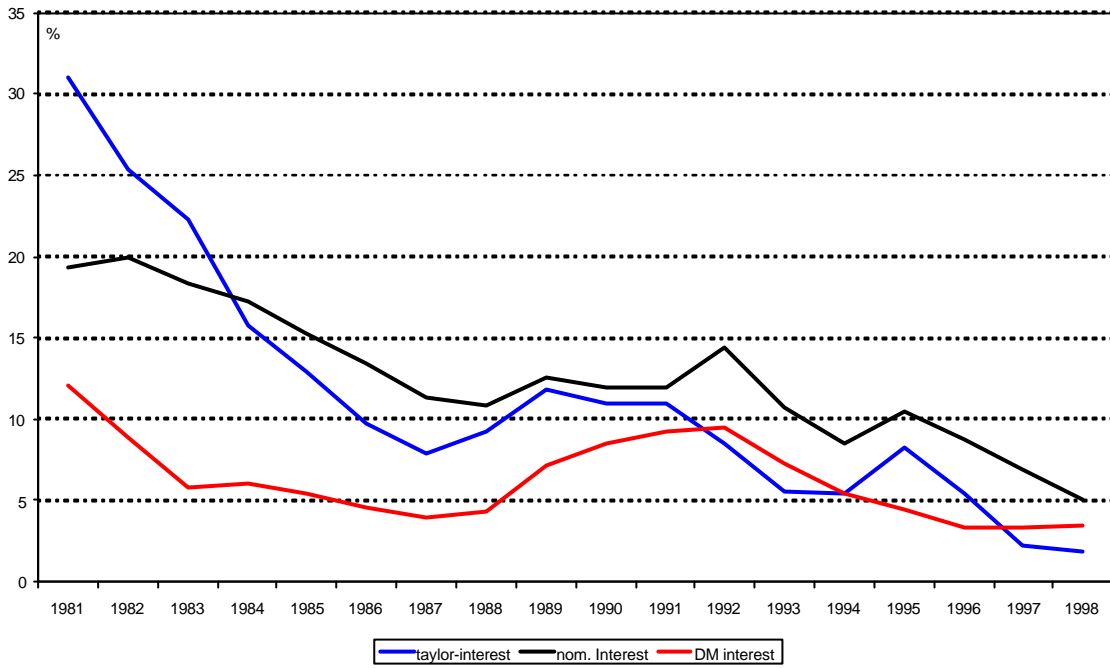
Source: OECD, Economic Outlook

Figure 8: Short-Term Capital Inflows in Italy
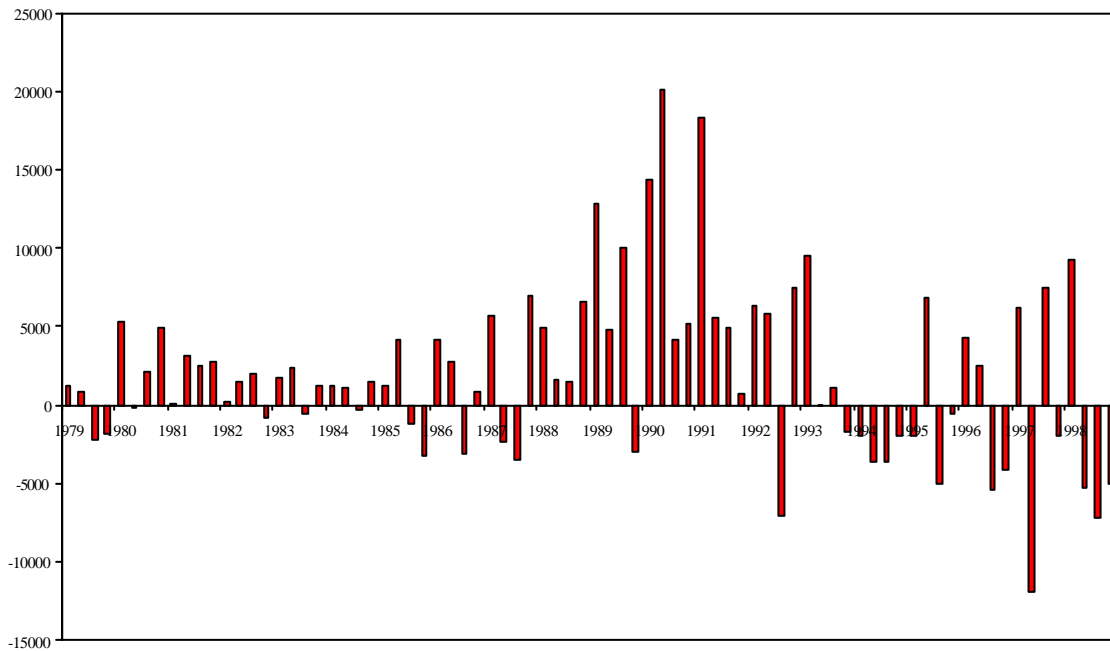
Source: IMF, International Financial Statistics

Figure 9: Foreign Exchange Reserves of Italy
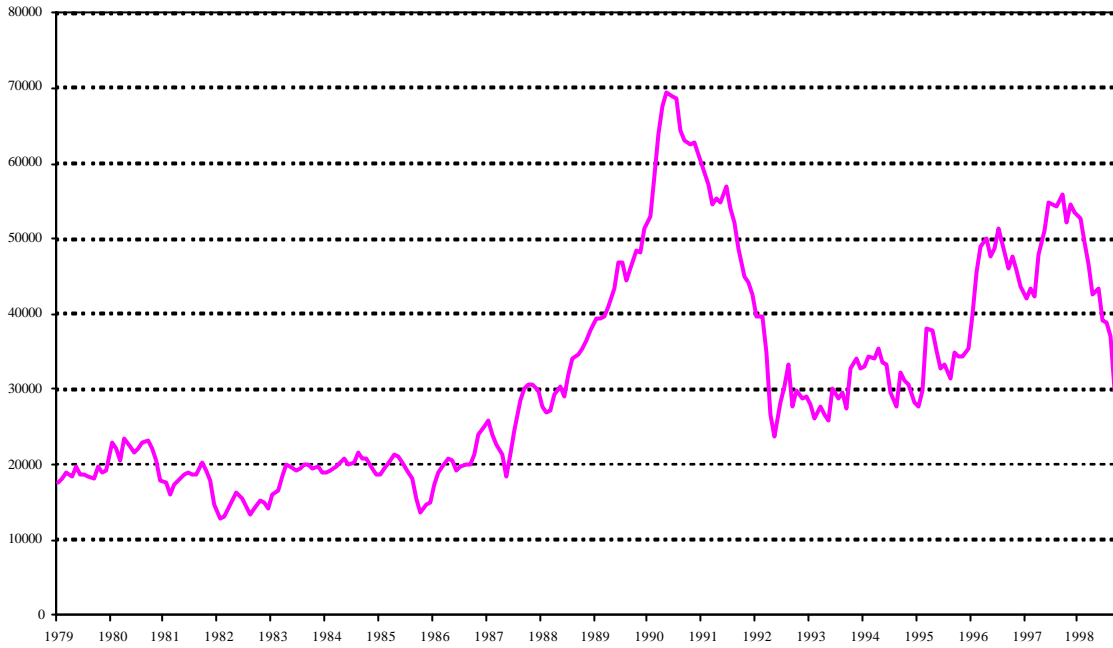
Source: IMF, International Financial Statistics
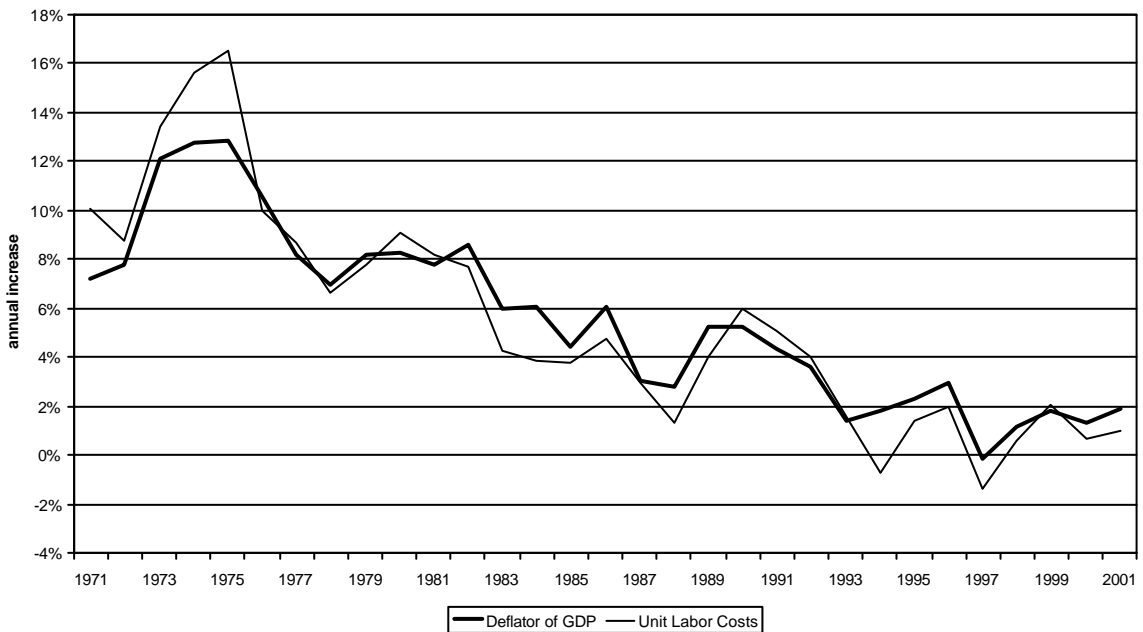
Figure 10: Taylor rate for France
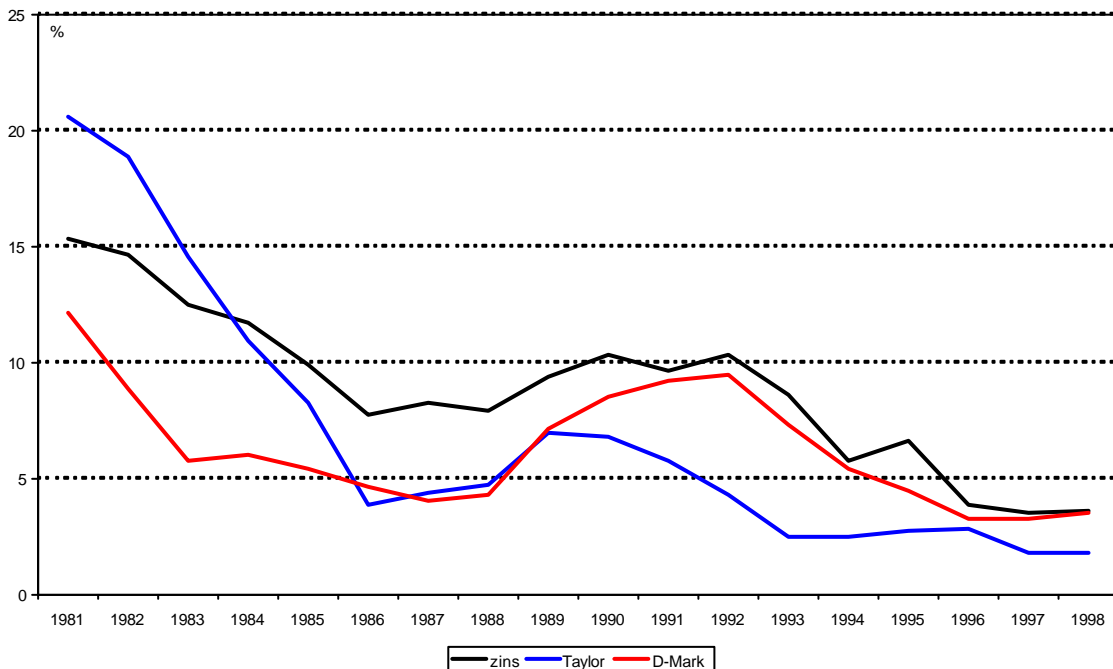
Source: OECD, Economic Outlook

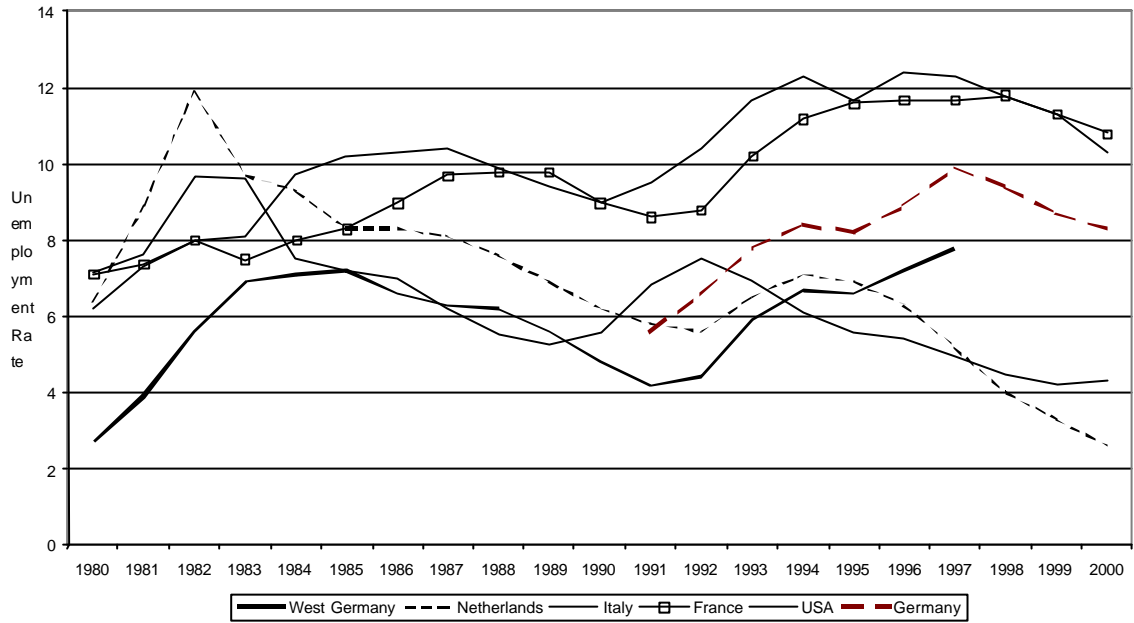**Figure 11: Short-term interest rates FRF and DEM**
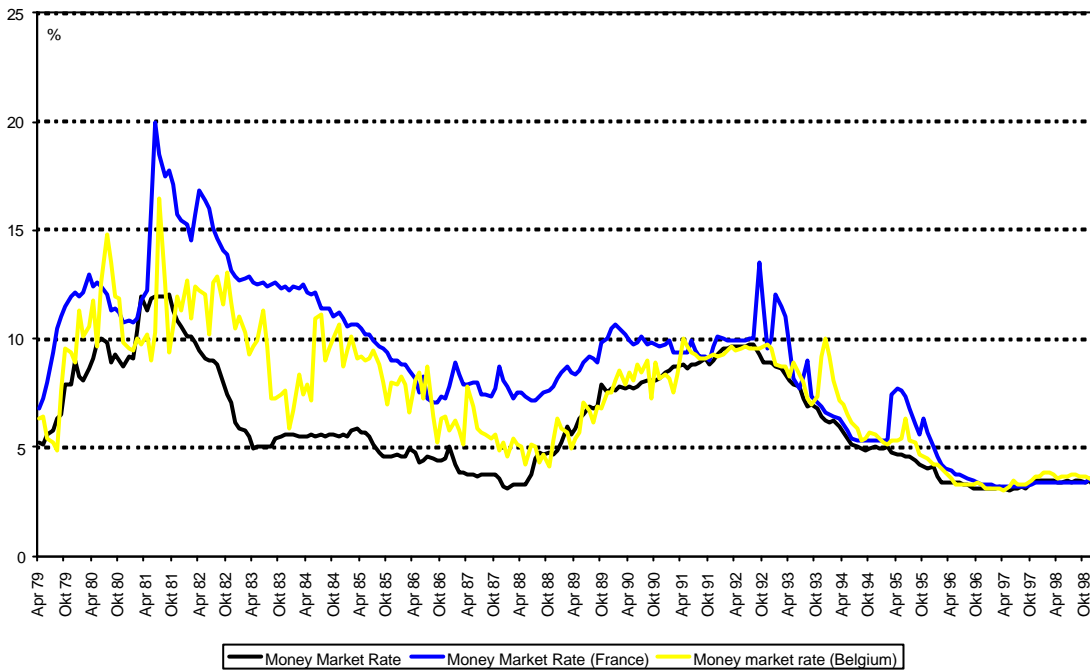
Source: IMF, International Financial Statistics

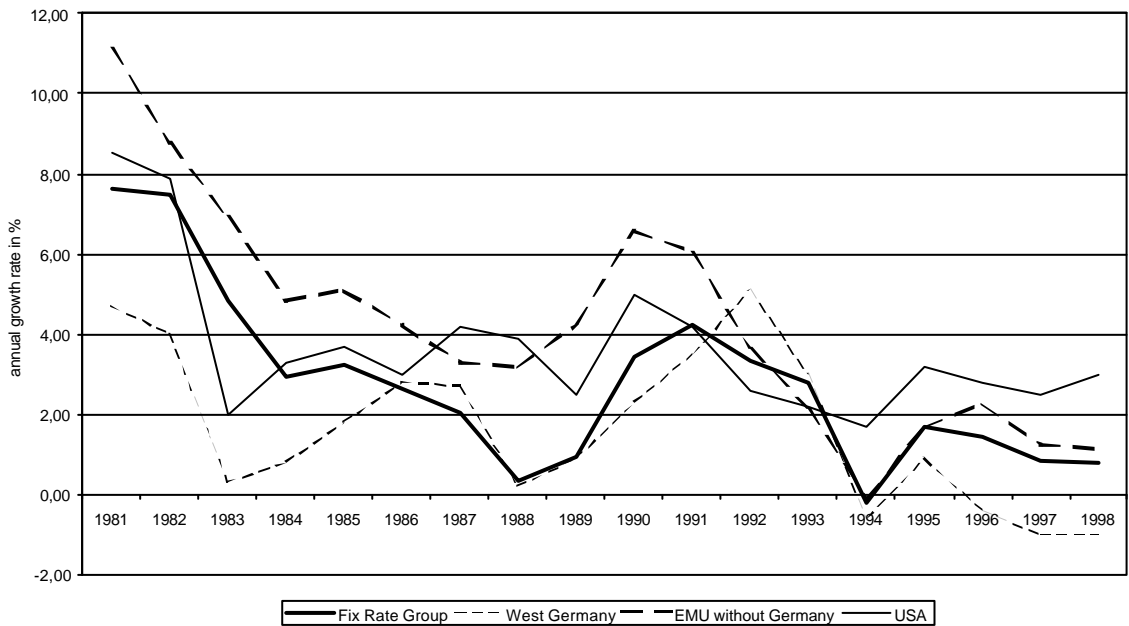Figure 12: EMU - Unit Labor Costs and Inflation

Source: OECD, Economic Outlook

Figure 13: Unemployment in Europe

Source: OECD, Economic Outlook

Figure 14: Unit Labor Cost Development in Europe and the USA

Source: OECD, Economic Outlook

Figure 15: Unit Labor Costs