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Temi di discussione

del Servizio Studi

**The Defence of Exchange Rates in the EMS:
Instruments and Strategies, 1987-1993**

by Paolo Del Giovane



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**THE DEFENCE OF EXCHANGE RATES IN THE EMS:
INSTRUMENTS AND STRATEGIES, 1987-1993**

by Paolo Del Giovane (*)

Abstract

The crisis of the EMS that culminated in August 1993 with the widening of the fluctuation band justifies further analysis of the working of the System in recent years. This paper covers the period from 1987 to 1993 and examines the use of the three instruments for defending exchange rates provided for in the Basle-Nyborg agreement, namely 1) exchange rate flexibility within the fluctuation band, 2) intervention in the foreign exchange market, and 3) interest rate changes. The first part reviews the different strategies that countries participating in the exchange rate mechanism adopted between 1987 and 1991, when such instruments were generally effective in countering speculative pressures and helped avoid realignments of the central rates. The second part focuses on the period between June 1992 and August 1993, which saw significantly greater tensions lead to five realignments in eight months and finally to the widening of the fluctuation band. During this period the use of exchange rate flexibility within the band provided positive results only for those countries which had successfully used it in the past; exchange market intervention was effective when coordinated; interest rate increases, perceived by the markets as inconsistent with monetary policy's domestic agenda, were insufficient to eliminate tensions.

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1. Introduction and main conclusions¹

In the wake of the protracted crisis of the EMS and its traumatic conclusion in August 1993, with the widening of the fluctuation band of the exchange rate mechanism (ERM), further analysis of the working of the System in recent years is appropriate. This paper examines the use of the instruments for defending exchange rates during the period 1987-1993. It devotes particular attention to the implementation of the Basle-Nyborg agreement of September 1987, which aimed at achieving closer coordination among the monetary authorities for the defence of central rates, mainly through three instruments: 1) exchange rate flexibility within the band, 2) intervention in the foreign exchange market, and 3) interest rate changes. As to the recent crisis, this work does not seek to provide an exhaustive explanation, but rather to identify relationships between the use and effectiveness of the three instruments during this crisis and the different strategies pursued by national authorities in the preceding five years.

The first part of the paper covers the period between the January 1987 realignment and the end of 1991, characterized by conditions of pronounced stability within the EMS: three new currencies joined the ERM, the lira entered the narrow band and capital movements were gradually liberalized. In this period instruments for defending exchange rates were on the whole effective in countering speculative pressures and helped avoid realignments. The analysis concentrates on the use of these instruments although other important factors contributed to the stability of the System, most notably the increasing convergence of the member countries' economies and the more and more concrete prospect of monetary union.

¹ I wish to thank Lorenzo Bini-Smaghi, Filippo Cesarano, Giampaolo Galli, Giorgio Gomel and Francesco Papadia for their helpful comments, and Bianca Bucci for preparing tables and graphs. I alone am responsible for the opinions expressed and any errors.

The precise combination of instruments employed differed from country to country. Generally, the French authorities' initial response to speculative pressures was to allow the franc to move in the band and intervene in the foreign exchange market; if necessary they subsequently pushed up market interest rates, in most cases by increasing official rates, with a clear "signaling effect". The sequence of use of the three instruments was similar in Italy. The scope for fluctuation within the band was widely exploited, so that the exchange rate of the lira was more variable than those of the other currencies (even after the lira entered the narrow band), although it rarely approached the lower limit of the band. As in France, the authorities made large-scale recourse to intervention in the foreign exchange market. In most cases interest rates were increased after extensive use had been made of the other two instruments. The strategy of the Danish authorities was based primarily on very flexible use of the fluctuation band; the Danish krone was the only currency which fell to the lower limit on several occasions. The Irish authorities countered speculative pressures with exchange market intervention and interest rate increases; their use of the latter intensified towards the end of the period under review. A radical change of strategy was implemented by Belgium in 1990, when the Government announced a tighter link of the Belgian franc to the System's "anchor" currency and its intention to avoid changing the franc's central rate against the Deutschemark in the event of a realignment.

The following broad conclusions emerge from this review of the strategies adopted by the various countries in the period 1987-1991:

- a) In keeping with the Basle-Nyborg guidelines, exchange rate movements within the band were used with flexibility in most countries. Especially in periods of tension, exchange rates were allowed to fluctuate, so as to absorb pressures in the market. However, this instrument was insufficient and, moreover, was rarely used in a way that would damage speculative positions. In most cases, once the tensions

abated, the exchange rate returned to the previous level only after a long time, if at all.

- b) Intervention was used intensively, generally before exchange rates reached the compulsory intervention margins, but was almost never sufficient to eliminate speculative pressures. In most of the episodes considered the amount of intervention grew in the course of the episode; the burden of intervention generally fell only on the weak currency countries, a factor that may have conditioned this instrument's effectiveness.
- c) In all the episodes considered speculative pressures ended only after the modification of official or market interest rates. The market rate increases needed to overcome the tensions were smaller when they were decided promptly to check the emerging pressures; generally, the increase was larger when the action was delayed and in some cases it had to be accompanied by a rise in official rates.

The second part of the paper examines the use of the three Basle-Nyborg instruments between June 1992 and August 1993, when exchange market pressures forced five realignments in eight months and, in August 1993, led to the widening of the ERM fluctuation band. A substantial continuity with respect to the previous period marks the strategies the authorities followed during this crisis, particularly as regards the timing and priorities assigned to the three instruments. In some cases, however, the mix was changed in the face of exceptional tensions and on some occasions the authorities also resorted to instruments -- coordinated intramarginal interventions and joint statements -- which had not been explicitly provided for in the Basle-Nyborg agreement.

On the instruments' effectiveness during the crisis, the following conclusions are offered:

- a) The fluctuation band was put to flexible use, also by countries that in the previous period had exploited this instrument to a lesser extent. It produced good results in the countries, like Denmark, that had used it effectively in

- the previous period, i.e. in order to penalize the speculative positions; by contrast, it proved ineffective or even counterproductive where it had not been commonly used before (e.g. in Ireland), since recourse to it was now interpreted as showing that the authorities were in difficulty rather than signaling a change in their strategy.
- b) Foreign exchange interventions, although far larger than in the previous period, were in general insufficient to check tensions when they were carried out unilaterally; their effectiveness was much greater when they were coordinated, in particular for defending the French franc and the Danish krone.
 - c) Interest rate increases, which in the previous period had been decisive in eliminating tensions, were insufficient and in some cases counterproductive; in the face of recession in Europe, large increases in interest rates appeared to be in conflict with the domestic necessities of monetary policy in most countries and unsustainable.

2. The experience of the period 1987-1991

2.1 Instruments for defending exchange rates and the Basle-Nyborg agreement

The January 1987 realignment, which was not considered to be justified by economic fundamentals, prompted the monetary authorities of the EMS countries to reflect on the functioning of the ERM and the instruments to counter tensions.² The Basle-Nyborg agreement, signed in September 1987 by the governors and the financial ministers of the European Community, was designed to reinforce the System through: a) closer coordination of the central banks' action in the event of tensions; b) greater willingness to allow exchange rates to fluctuate within the band, so as to increase the risk of those speculating against a

² See Reports 58 and 59 of the Dalgaard Group of the Committee of Governors, respectively of March 1987 (Report on Issues Raised by the Realignment of 12th January 1987) and May 1987 (Report on the Working of the European Monetary System).

currency; c) prompter and more flexible use of interest rates to increase the cost of speculation. The governors also underlined the need to decide realignments in a way that would discourage speculators: realignments should not be decided under market pressure and their amount should be limited so as to reduce their repercussions on market quotations.

The agreement also included some changes of the ERM operating mechanisms, particularly concerning the financing of interventions. This was extended to interventions carried out within the fluctuation band (intramarginal interventions) through the very short-term financing facility (VSTF), with a ceiling equal to twice the debtor quota of the central bank concerned under the short-term monetary support arrangement.³ The ceiling for France and Italy is, respectively, about 3.5 and 2.3 billion ecus, much less than the amount of the respective central banks' interventions during some of the episodes of tension. During the period 1987-1991 the VSTF was used only once to finance intramarginal interventions (by the Bank of France, in the autumn of 1987). It must be said in passing that all intramarginal interventions, including those made by central banks drawing on their own reserves, must be approved by the central bank issuing the currency used, with the exception of interventions smaller than specific amounts established on a bilateral basis.⁴

3 The VSTF is a reciprocal credit facility through which each central bank makes its own currency available to the others by means of spot sales or purchases of Community currencies against the crediting or debiting of accounts denominated in ecus with the European Monetary Co-operation Fund (EMCF). Before the agreement, the VSTF could be drawn automatically and without limit for interventions at the margins whereas its use for intramarginal interventions was governed by special arrangements between central banks.

4 The procedures for the use of the VSTF in case of interventions at the margins were also modified, particularly as regards the time of settlement. The maximum duration of credit was lengthened from two and a half months to three and a half; credits remained automatically renewable for a three-month period, while the ceiling for the renewal, previously equal to the debtor quota, was doubled. The governors also decided that settlement in ecus, although formally limited to 50 per cent of the loan, could in practice be extended up to 100 per cent, provided that this did not result in an unbalanced reserve composition for the creditor country or in an accumulation of excessively large

In summary, the Basle-Nyborg agreement defined a reference framework for exchange rate management within the EMS, with authorities having to cooperate more closely to defend the exchange rates against speculation not only through interventions, as in the first years of the EMS, but also through movements of market exchange rates within the fluctuation band and changes in interest rates.

2.2 Use of the instruments

This section surveys the use of the three instruments in the period 1987-1991. The analysis is based on statistical data and an examination of the eight main episodes of tension that occurred after the Basle-Nyborg agreement (they are described in detail in part 1 of the Appendix).⁵ Episodes of tension are defined here as those in which at least one of the three instruments recorded significant changes in one or more member countries. The selected episodes generally coincide with those analyzed by the main international organizations in their comments on the events within the EMS. For each episode the Appendix presents a brief list of the main factors of tension, a schematical description of the extent to and the order in which the three instruments were used in the various countries, and a chronology, displaying the sequence of events in greater detail. In the episodes considered speculative pressures were not always uniformly distributed on all currencies: they tended to concentrate on a limited number of currencies, sometimes only on one. Since the authorities' behaviour was generally

creditor or debtor positions in ecu accounts in the EMCF. In the period 1987-1991 the VSTF was used twice for interventions at the margins, by the Danish central bank.

⁵ These episodes were determined by an appreciation of the DM and the currencies linked to it. For the sake of completeness, the episodes in which other currencies played the role of "strong" currency are also described in the Appendix. Since the two types of episodes were substantially different (only in the former were speculative pressures determined by expectations of a realignment), they are grouped separately: the former (including one episode preceding Basle-Nyborg) are numbered from 1 to 9, the latter from 10 to 11.

different in these two circumstances, the following discussion frequently distinguishes between currencies "directly" involved in the tensions and those only "indirectly" involved.

a) Exchange rate flexibility within the band

The use of this instrument is evaluated on the basis of three indicators. The first two indicators concern respectively the variability of each currency's exchange rate vis-à-vis the DM and the variability of its divergence from the centre of the band (Table 1); the third refers to the distribution of the bilateral divergences vis-à-vis the DM within the fluctuation band (Table 2). These indicators show that exchange rate variability did not increase after the Basle-Nyborg agreement but that the band was used more widely. For the ERM countries as a group, the first two indicators are lower in the period considered than in 1979-1986: the average daily change of the exchange rate with respect to the DM was equal to 0.07 per cent, against 0.11 per cent in the previous period; the standard deviation of the divergence from the centre of the band decreased from 0.5 to 0.4 per cent. However, in 1987-1991 exchange rate fluctuations have more frequently involved the part of the band closer to the lower margin: the percentage of observation for which the divergence from the central rate against the DM exceeds 1.5 per cent increased from 14 to 22 per cent.

Examining the individual currencies in the period 1987-1991, it will be noticed that the lira displays the highest daily variability with respect to the DM. For the period as a whole its average exchange rate variation is 0.09 per cent, compared with 0.08 for the Danish krone, 0.07 for the French franc and 0.06 for the Irish punt and Belgian franc. The greater variability of the lira is confirmed by the figures concerning the divergence from the centre of the band: the standard deviation for the lira is about double that for other currencies (0.7 per cent, against values of between 0.3 and 0.4 per cent). Even if the analysis is restricted to the period following the entry in the narrow band, the variability of the

Table 1

USE OF THE FLUCTUATION BAND: EXCHANGE RATES VARIABILITY

(variability of the exchange rate with respect to the DM and of its divergence from the centre of the band) (1)

	Belgian franc	Danish krone	French franc	German mark	Irish punt	Italian lira	Dutch guilder
1987 (2) Aug.-Nov.	0.04 0.06	0.09 0.12	0.06 0.11	- -	0.08 0.10	0.08 0.10	0.02 0.02
1988 Aug.-Nov.	0.04 0.03	0.08 0.07	0.06 0.05	- -	0.06 0.06	0.08 0.07	0.03 0.03
1989 Nov.-Dec.	0.05 0.06	0.06 0.08	0.07 0.07	- -	0.08 0.11	0.12 0.15	0.04 0.05
1990 (3) Nov.-Dec.	0.10 0.05	0.08 0.10	0.07 0.10	- -	0.06 0.06	0.09 0.09	0.03 0.05
1991 Nov.-Dec.	0.04 0.03	0.07 0.06	0.06 0.04	- -	0.04 0.04	0.08 0.08	0.02 0.02
1987-1991 (4) for reference:	0.06	0.08	0.07	-	0.06	0.09	0.03
1979-1986 (5)	0.10	0.12	0.10	-	0.13	0.10	0.08

(1) For each country: in the first column, average of daily percentage changes (in absolute value) of the exchange rate with respect to the DM; in the second column, standard deviation of the daily divergences from the centre of the band. - (2) Excluding January. - (3) For Italy, excluding 1-7 January. - (4) Average of the 5 annual figures. - (5) From 13.3.1979 to 31.12.1986, weighted average (on the basis of the number of observations) of the statistics calculated for the periods between realignments; data immediately preceding and following realignments are excluded.

Table 2

**USE OF THE FLUCTUATION BAND: DISTRIBUTION IN THE BAND OF THE
BILATERAL DIVERGENCES WITH RESPECT TO THE DM
(percentages)**

	1987		1988		1989		1990		1991		1987-91	1979-86 (2)
	Oct-Nov	Year (1)	Sep-Oct	Year	Nov-Dec	Year	Nov-Dec	Year	Nov-Dec	Year		
Belgian franc												
1.5 to max	-	-	-	-	-	-	-	-	-	-	-	0.2
0.75 to 1.5	-	-	-	-	-	-	-	-	-	0.4	0.1	4.0
0 to 0.75	-	-	-	-	-	-	5.0	49.0	100	99.2	29.6	15.1
0 to -0.75	13.6	69.8	-	-	-	-	47.5	31.6	-	0.4	20.4	25.4
-0.75 to -1.5	70.5	25.5	-	49.8	-	27.1	40.0	13.0	-	-	23.1	19.8
-1.5 to min	15.9	4.7	100	50.2	100	72.9	7.5	6.3	-	-	26.8	35.5
Danish krone												
1.5 to max	-	0.4	-	-	-	-	-	-	-	-	0.1	10.6
0.75 to 1.5	-	43.4	-	-	-	-	-	-	-	-	8.7	20.3
0 to 0.75	-	12.8	-	23.3	-	-	-	35.5	-	-	14.3	27.1
0 to -0.75	36.4	10.2	37.2	42.7	-	-	55.0	42.7	-	27.3	24.6	16.5
-0.75 to -1.5	61.4	32.3	62.8	34.0	-	4.0	41.5	18.5	-	51.8	28.1	12.9
-1.5 to min	2.3	0.9	-	-	100	96.0	2.5	3.2	100	20.9	24.2	11.6
French franc												
1.5 to max	-	-	-	-	-	-	-	-	-	-	-	19.8
0.75 to 1.5	2.3	20.0	-	-	-	-	-	-	-	-	4.0	12.3
0 to 0.75	43.2	61.3	-	-	-	-	5.0	25.4	-	-	17.3	33.8
0 to -0.75	4.5	1.7	-	31.6	-	16.3	47.5	47.6	-	3.6	20.2	23.8
-0.75 to -1.5	38.6	14.9	39.5	41.1	33.3	61.4	40.0	24.2	-	57.7	39.9	5.1
-1.5 to min	11.4	2.1	60.5	27.3	66.7	22.3	7.5	2.8	100	38.7	18.6	5.5
Irish punt												
1.5 to max	-	-	-	-	-	-	-	-	-	-	-	12.0
0.75 to 1.5	-	-	-	-	-	-	-	-	-	-	-	20.1
0 to 0.75	34.1	23.0	67.4	29.2	-	-	30.0	62.5	-	1.2	23.2	23.9
0 to -0.75	34.1	66.0	32.6	64.4	7.7	83.7	65.0	21.4	95.0	96.0	66.3	17.2
-0.75 to -1.5	31.8	11.1	-	6.3	46.2	9.2	5.0	15.3	5.0	2.8	8.9	10.9
-1.5 to min	-	-	-	-	46.2	7.2	-	0.8	-	-	1.6	15.8
Italian lira												
4 to max	-	-	-	-	-	-	-	-	-	-	-	6.4
2.25 to 4	-	-	-	-	-	-	-	-	-	-	-	11.5
1.5 to 2.25	-	-	-	-	-	-	-	40.3	-	-	8.1	14.7
0.75 to 1.5	-	26.4	-	-	-	-	-	14.1	-	13.8	10.9	20.4
0 to 0.75	-	2.1	-	-	-	15.5	-	19.0	-	47.4	16.8	13.5
0 to -0.75	95.4	52.8	-	-	-	18.7	65	21.0	25	26.9	23.9	13.0
-0.75 to -1.5	2.3	0.4	-	-	12.8	17.5	35	5.6	75	11.9	7.1	4.5
-1.5 to -2.25	2.3	8.9	-	18.2	38.5	37.4	-	-	-	-	12.9	11.3
-2.25 to -4	-	9.4	100	81.8	43.6	10.0	-	-	-	-	20.2	4.3
-4 to min	-	-	-	-	5.1	0.8	-	-	-	-	0.2	0.4
Dutch guilder												
1.5 to max	-	-	-	-	-	-	-	-	-	-	-	7.3
0.75 to 1.5	-	-	-	-	-	-	-	-	-	-	-	11.3
0 to 0.75	100	61.3	-	49.4	5.1	8.8	-	48.8	30.0	41.5	42.0	35.0
0 to -0.75	-	38.7	100	50.6	94.9	91.2	100	51.2	70.0	58.5	58.0	41.1
-0.75 to -1.5	-	-	-	-	-	-	-	-	-	-	-	4.6
-1.5 to min	-	-	-	-	-	-	-	-	-	-	-	0.8

(1) Excluding January.- (2) Starting from 13.3.1979.

Italian currency is still the highest: in 1990-91 its average daily variation is 0.85 per cent, against 0.75 for the Danish krone and lower values for the other currencies; the standard deviation of the divergence from the centre of the band is on average about 0.5 per cent, against values of between 0.3 and 0.4 per cent for the other currencies.

Table 2 indicates that the lira's fluctuations against the DM, although frequent and wide, were confined to a limited part of the fluctuation band and almost never approached the lower limit. In the period 1987-89, when the lira was in the wide band, the divergence with respect to the DM exceeded 4 per cent only at the end of 1989, for a few days preceding the lira's entry to the narrow band. In the subsequent period the divergence never exceeded 1.4 per cent. Other currencies exploited the width of the band to a greater extent. The French franc's deviations from its central rate against the DM were closer to the lower margin for an appreciable number of days in 1988, 1989 and 1991; the use of the lower part of the band increased significantly in the sub-periods of major tension of the same years. Similar considerations hold for Belgium in the two years preceding the adoption of a "hard currency" policy (1988-89) and for Denmark in 1989 and 1991. By contrast, the behaviour of the Irish punt resembled that of the lira: most of the time it was in the part of the band closer to the centre.

Examination of the main episodes of tension in the period between the Basle-Nyborg agreement and the end of 1991 (episodes 2-9 in the Appendix) confirms that the flexibility afforded by the fluctuation band was used extensively by the Danish, French and Italian authorities and little by the Irish authorities and by those countries which adhered "de facto" to a "hard currency" area with the DM (the Netherlands and, from 1990, Belgium). In all except one of the episodes examined, the authorities of the countries "directly" involved in tensions initially allowed their respective currencies to depreciate. In none of these cases was fluctuation sufficient to counter the tensions, and the authorities were forced to deploy the other

two instruments or to intensify their use. On the other hand, for the currencies only "indirectly" affected by the speculative pressures the fluctuation within the band was in some cases sufficient.

The Danish authorities made the widest and most effective use of this instrument. In January-March and September-October 1989 (episodes 5 and 6), during which speculative pressures concentrated mainly on the krone, they initially allowed the exchange rate against the DM to weaken (by about 0.4 per cent in both cases, over a period of respectively four and two weeks) and reach its lower limit of fluctuation. This enabled them to attenuate the tensions, which were then entirely eliminated with the use of the other two instruments (interventions at the margin in episode 5; also a significant interest rate increase in episode 6). However, in episodes 3 and 8, in which tensions were more generalized, the krone's movement within the band was by itself sufficient.

The Bank of France also used movements within the band to a considerable extent, but unlike the Danish authorities the French central bank never allowed the exchange rate to reach the lower limit. In all episodes of tension between the franc and the DM, with only one exception, the Bank of France only partly countered the initial weakening of the franc, making generally moderate recourse to the other two instruments, which it used intensively only subsequently. The franc's depreciation was particularly pronounced in the last three episodes, between the end of 1989 and the end of 1991, when the bilateral divergence between the franc and the DM reached 2 per cent.⁶

The exchange rate of the lira weakened significantly in each episode during which the currency was affected by the tensions. As indicated above, its fluctuations did not involve

⁶ The lower limit was repeatedly reached during the episodes of tensions determined by a strengthening of the lira and the peseta in April-August 1990 and March-June 1991 (episodes 10 and 11). The French authorities used the other two instruments only after exhausting the possibilities of fluctuation within the band.

the entire width of the band and the lira almost never approached the lower limit: in the two episodes following the lira's entry to the narrow band (episodes 8 and 9), its bilateral divergence with respect to the DM reached only 1.2 and 1.4 per cent. The timing in the use of the instrument was similar to that in France: the Italian authorities generally allowed the exchange rate to fall in the initial part of the episodes, and only subsequently brought the other two instruments into play to a greater extent. In no episode involving the lira was exchange rate fluctuation sufficient to counter speculative pressures, so that the authorities had also to make intensive use of the other two instruments.

In Belgium, the authorities allowed significant depreciations of the franc in the episodes preceding the policy change implemented in 1990 (see section 2.3). In episode 8 (November-December 1990), the first one after this change, the Belgian franc was kept close to its central rate against the DM by means of interventions and, above all, interest rate increases. Subsequently (episode 9), the Belgian franc fluctuated in parallel with the DM and the Dutch guilder, without substantial intervention or interest rate changes on the part of the Belgian authorities.

The Irish authorities used the scope for fluctuation within the band only to a very limited extent. In the three episodes between 1988 and 1989 (episodes 3, 4 and 5) the punt did not deviate significantly from its central rate against the DM; in four episodes it remained in an intermediate position between the strongest and the weakest currencies, close to the centre of the band; it weakened significantly only in episode 7, at the end of 1989, when it approached but did not reach the lower limit.

It is important to underline that exchange rate flexibility within the fluctuation band can be effective in countering speculative pressures if it increases market perception of the risk of a future appreciation of the exchange

rate ("two-way risk").⁷ If a currency rebounds once the tensions end, agents who speculated against it make a loss. It is therefore useful to examine exchange rate behaviour also in the periods immediately following the bouts of tension. For each of the episodes considered, Table 3 reports the initial value of the bilateral divergence with the DM, the length of the phase of depreciation and the maximum (negative) divergence reached during the episode; it also shows how long it took the exchange rate to recover half and all of its maximum loss, if ever. These figures show that exchange rate flexibility within the band was almost never used in a way that penalized the speculative positions. Only in two episodes did the exchange rate of at least one of the currencies involved return to a level equal to or higher than its original level within one month after reaching the minimum (in three other episodes this occurred within three months). The Danish krone is the only currency that recovered the entire depreciation within one month on two occasions (the two episodes at the end of 1989); this occurred only once for the Belgian franc, never for the other currencies. The French franc, the lira and the Irish punt returned to the initial value within three months on two occasions.

b) Intervention in the foreign exchange market

Table 4 presents statistics on the variations of official reserves, which can be treated as a proxy for exchange market interventions on the part of the central banks.⁸ These data indicate a relatively large use of this instrument by the French and Italian authorities: France's reserves of convertible currencies fell significantly in the closing months of 1987, 1988 and 1991, and Italy's during the episodes of 1990-91. Sizable reductions in reserves were also recorded in

⁷ See the document of the Exchange Rate Policy Sub-Committee of the Committee of Governors (Enhancing the Two-Way Risk in the EMS Exchange Rate Mechanism), published in February 1993.

⁸ Data on interventions are confidential and cannot be published.

Table 3

**BILATERAL DIVERGENCE WITH RESPECT TO THE DM DURING
AND IMMEDIATELY FOLLOWING THE EPISODES OF TENSION**

Episodes	Initial value	Length of the depreciation	Minimum value (1)	Recovery of 50% of the depreciation (2)	Return to the initial value (2)
2: Oct.-Nov. 1987					
French franc	0.46	13 days	-1.65 (-2.11)	about 1 year	over 1 year
Irish punt	0.11	8 days	-1.18 (-1.29)	about 5 months	about 8 months
Italian lira	-0.09	11 days	-2.75 (-2.66)	over 1 year	over 1 year
3: Aug.-Sep. 1988					
Danish krone	0.43	39 days	-0.85 (-1.28)	over 1 year	over 1 year
French franc	-0.51	1 month	-1.58 (-1.07)	about 6 months	over 1 year
Italian lira	-2.34	1 month	-3.80 (-1.46)	over 2 months	over 1 year
4: October 1988					
Danish krone	-0.82	14 days	-1.13 (-0.31)	over 1 month	over 1 year
French franc	-1.44	21 days	-1.95 (-0.51)	over 2 months	over 3 months
Irish punt	0.14	11 days	-0.41 (-0.55)	over 1 month	over 1 year
5: Jan.-Mar. 1989					
Danish krone	-1.65	1 month	-2.29 (-0.64)	20 days	about 10 months
Irish punt	-0.06	34 days	-0.61 (-0.55)	8 days	over 1 year
Italian lira	-1.03	17 days	-2.45 (-1.42)	18 days	over 2 months
6: Sep.-Oct. 1989					
Belgian franc	-1.08	22 days	-1.91 (-0.83)	over 3 months	over 4 months
Danish krone	-1.79	36 days	-2.29 (-0.50)	18 days	23 days
French franc	-0.44	35 days	-1.36 (-0.92)	about 4 months	about 5 months
Italian lira	0.38	33 days	-2.23 (-2.61)	-	-
7: Nov.-Dec. 1989					
Belgian franc	-1.65	45 days	-2.02 (-0.37)	10 days	17 days
Danish krone	-1.67	56 days	-2.11 (-0.44)	10 days	14 days
French franc	-1.09	35 days	-1.96 (-0.87)	1 month	about 2 months
Irish punt	-0.61	48 days	-1.85 (-1.24)	22 days	about 2 months
Italian lira	-1.29	56 days	-4.07 (-2.78)	about 2 months	-
8: Nov.-Dec. 1990					
Danish krone	-0.28	41 days	-1.55 (-1.27)	16 days	about 5 months
French franc	0.05	43 days	-1.86 (-1.91)	over 3 months	-
Irish punt	0.04	36 days	-0.91 (-0.95)	19 days	-
Italian lira	-0.30	26 days	-1.20 (-0.90)	9 days	over 1 month
9: Oct.-Dec. 1991					
Danish krone	-0.99	67 days	-2.21 (-1.22)	1 month	about 5 months
French franc	-1.55	49 days	-1.94 (-0.39)	about 1 month	about 2 months
Irish punt	-0.17	73 days	-0.88 (-0.71)	8 days	over 1 month
Italian lira	0.15	56 days	-1.41 (-1.56)	about 1 month	-

(1) In brackets, changes with respect to the initial value, expressed in percentage points. - (2) Time elapsed from the day on which the minimum was reached; a dash means that the recovery never occurred.

Table 4

VARIATIONS OF OFFICIAL RESERVES DURING PERIODS OF TENSION (1)

	Belgium	Denmark	France	Germany	Ireland	Italy	Netherlands
Aug.-Nov. 1987	842 (11.6)	1,149 (13.9)	-2,604 (10.0)	15,391 (28.0)	418 (11.3)	6,939 (36.1)	1,631 (13.3)
Aug.-Nov. 1988	817 (10.8)	-1,576 (13.5)	-3,787 (14.0)	272 (0.5)	-251 (5.2)	4,658 (17.1)	1,983 (15.0)
Nov.-Dec. 1989 (2)	578 (6.3)	-4,680 (45.8)	-249 (1.1)	1,026 (1.9)	162 (4.6)	-361 (0.8)	406 (2.8)
Nov.-Dec. 1990	81 (0.7)	2,705 (27.6)	2,488 (7.9)	1,873 (3.1)	-1,250 (20.5)	-5,910 (8.9)	-309 (1.9)
Nov.-Dec. 1991	1,013 (10.1)	-102 (1.5)	-2,772 (8.9)	2,398 (4.4)	34 (0.6)	-5,431 (10.7)	1,066 (7.0)

(1) Data are published by the IMF and refer to reserves in convertible currencies, expressed in millions of dollars; figures in brackets indicate the percentage variations with respect to the initial stocks. - (2) The figure for Denmark refers to January-November 1989.

Denmark in the course of 1989 and Ireland at the end of 1990.⁹

In the main episodes of tension determined by the strengthening of the DM, intervention was generally intramarginal and the burden of intervention fell entirely on the central banks of the weak currency countries: the Bundesbank and the other strong currency central banks never made interventions of this type. As mentioned in section 2.1, only the intramarginal interventions by the Bank of France during episode 2 (in the autumn of 1987) were financed through the very short-term financing facility. It is difficult to evaluate the effectiveness of intramarginal intervention. In all the episodes considered pressures persisted even after large interventions, whose amount in most cases grew during the course of the episode. They abated only when the authorities supplemented -- or replaced -- intervention by raising interest rates. An exception is the episode at the end of 1990, when the elimination of the pressures on the French franc was largely attributable to intramarginal intervention by the Bank of France (which in the meanwhile was allowing the franc to depreciate in the band) rather than to the very small increases in interest rates. The effectiveness of intramarginal interventions was probably hampered by their unilateral nature; the most recent experience, as shown in section 3, also indicates that the effectiveness of such interventions is strictly connected to the degree of symmetry with which they are carried out.

In the course of 1987-1991, there were interventions at the limit in only three episodes, involving the Danish krone: in January-March and September-October 1989 (episodes 5 and 6), when it reached its fluctuation limit with the DM, and October-

⁹ Data on reserves are not always a good indicator of the size of intervention. In most cases, for example, the French and Italian interventions were larger than the corresponding changes in reserves; the decrease in Danish reserves at the end of 1988 does not reflect interventions in the foreign exchange market; the data on reserves do not reflect the limited sales of foreign currency by the Belgian central bank between 1987 and 1990 and those effected by the French and Irish authorities respectively at the end of 1990 and 1991.

December 1991 (episode 9), with the Belgian franc. It is interesting to compare the first two episodes. In January-March 1989 the Bundesbank intervened for appreciable amounts, although they were much smaller than those effected by the Danish central bank; the interventions of the two central banks over a three-day period managed to end tensions, which had previously remained strong notwithstanding a widening of the interest rate differential. In September-October the intervention was virtually unilateral, as the Bundesbank intervened for the equivalent of a few million dollars, compared with large interventions by the Danish central bank: tensions continued, and only abated after a large increase in Danish interest rates. This may indicate that the effectiveness of interventions at the margin is also conditioned by the degree of symmetry with which they are made.¹⁰ In the course of episodes 6 and 9 the Danish central bank made use of the very short-term financing facility.

c) Interest rate changes

The degree of utilization of this instrument is evaluated on the basis of the variability of both official and short-term market interest rates. We consider official rates to be those used by the authorities to signal the stance of monetary policy.¹¹ The main reference rates are the German discount and

¹⁰ The way intervention was used, and its effectiveness, differed in the two episodes of tension caused by the strengthening of the lira and the peseta in April-August 1990 (episode 10) and March-June 1991 (episode 11). During both episodes large and substantially symmetric interventions were carried out both at the margin and intramarginally: Italian and Spanish authorities carried out intervention in amounts comparable to those effected by the French and German central banks. Such interventions, some of which were coordinated, were effective even when, as in episode 10, they were not supported by variations in interest rate differentials.

¹¹ The interest rates selected are those whose variations are reported in the Bank for International Settlements' reports on the main economic policy measures (Chronology of Economic Policy Developments): the discount rate and that on advances (lombard) in Germany, the Netherlands and Belgium, the discount rate in Italy, the appels d'offres and the pensions rate on repurchase agreements (7-day operations until July 1988 and 5-10 day subsequently) in France, the key current account lending rate in Denmark and the short-term facility rate in Ireland.

lombard rates; table 5a shows that in 1987-1991 these rates were changed respectively 10 and 11 times, by an average amount of 0.5-0.6 percentage points. The Italian discount rate was changed less frequently (7 times), but by a higher average amount (0.7 points).¹² In other ERM countries official rates were changed more frequently: 15 times in Denmark, 17 in the Netherlands, 22 in Belgium and 23 in France and Ireland. The average amount of the variations was 0.4 points in the Netherlands and France, 0.5 in Belgium and 0.6 in Denmark and Ireland. Thus, the table shows a rather intense use of official rate changes in Ireland, Belgium (especially between 1988 and 1989) and in France.

Considering short-term market interest rates (three-month interbank rates) and the respective differentials with the German rates (Table 5b), the daily variations (measured as absolute values and adjusted for the trend component) were relatively large on average in Ireland and, in the period following the entry in the narrow band, in Italy. They were smaller in Denmark (with the exception of 1989) and France; the smallest values were recorded in the Netherlands and Belgium, whose currencies are more closely linked to the DM.

During the episodes of tension in 1987-1991, some central banks, in particular the French and Italian authorities, resorted to significant interest rate increases after using the other two instruments; in other countries -- namely Belgium and, in some of the more recent episodes, Ireland -- interest rate changes were the main instrument adopted in countering speculative pressures. Interest rate increases were generally decisive in dissipating tensions; in none of the episodes considered were tensions eliminated without an increase,

¹² For Italy, the rate on fixed advances was not included in the table. It is comparable to other official rates only from May 1991, when the Italian authorities started to apply a single surcharge on the discount rate, fixed in relation to the monetary stance. Previously, the surcharge depended on the frequency with which banks resorted to this form of refinancing, ranging from a minimum of 0.5 and a maximum of 2.25 percentage points. Between May 1991 and the end of the year the surcharge was modified only once, in November.

Table 5a

VARIABILITY OF OFFICIAL INTEREST RATES (1)

	Belgium		Denmark		France		Ireland	
	Discount rate	Rate on advances	Current account lending rate	Appels d'offres	Pensions	Short-term facility rate		
1987 (2) Aug.-Dec.	5 0.3 0.46 0 0 0	5 0.3 0.46 0 0 0	1 0.5 0.13 0 0 0	5 0.35 0.22 2 0.50 0.28	6 0.33 0.28 2 0.50 0.28	8 0.50 1.45 1 0.50 0.25		
1988 Aug.-Nov.	9 0.25 0.42 3 0.25 0.17	9 0.25 0.42 3 0.25 0.17	2 0.25 0.24 0 0 0	7 0.29 0.23 2 0.25 0.18	5 0.35 0.21 1 0.25 0.10	2 0.63 0.54 0 0 0		
1989 Nov.-Dec.	4 0.63 0.68 0 0 0	4 0.69 0.87 0 0 0	4 0.88 1.18 1 1.50 0	4 0.56 0.56 1 0.50 0.19	4 0.56 0.56 1 0.50 0.20	4 1.0 1.25 1 1.0 0.48		
1990 Nov.-Dec.	1 0.25 0.09 1 0.25 0.04	1 0.25 0.09 1 0.25 0	3 0.50 0.62 0 0 0	3 0.25 0.26 1 0.25 0.06	3 0.25 0.26 0 0 0	4 0.56 0.59 1 0.75 0.25		
1991 Nov.-Dec.	2 0.50 - 1 0.50 0.18	18 0.20 0.45 1 0.20 0.07	5 0.50 0.39 1 0.50 0.18	4 0.34 0.16 2 0.43 0.28	3 0.33 0.10 2 0.38 0.22	5 0.3 0.90 1 0.3 0.18		
1987-1991	22 0.48 1.39	37 0.28 1.38	15 0.57 0.98	23 0.35 0.95	21 0.37 1.05	23 0.57 1.46		

	Germany		Italy		Netherlands	
	Discount rate	Rate on advances (lombard)	Discount rate	Discount rate	Rate on advances	
1987 (2) Aug.-Dec.	1 0.50 0.13 0 0 0	1 0.50 0.18 1 0.50 0.20	2 0.50 0.25 1 0.50 0.21	3 0.25 0.22 2 0.25 0.14	3 0.25 0.22 2 0.25 0.14	
1988 Aug.-Nov.	2 0.50 0.45 1 0.50 0.20	2 0.50 0.29 0 0 0	1 0.50 0.24 1 0.50 0.20	6 0.29 0.37 1 0.25 0.10	6 0.33 0.49 1 0.25 0.10	
1989 Nov.-Dec.	4 0.63 0.78 0 0 0	4 0.63 0.78 0 0 0	1 1 0.38 0 0 0	4 0.63 0.78 0 0 0	4 0.63 0.78 0 0 0	
1990 Nov.-Dec.	0 0 0 0 0 0	1 0.50 0.18 1 0.50 0	1 1 0.49 0 0 0	1 0.25 0.09 1 0.25 0	1 0.25 0.09 1 0.25 0	
1991 Nov.-Dec.	3 0.67 0.56 1 0.50 0.18	3 0.42 0.23 1 0.50 0.18	2 0.75 0.48 1 0.50 0.17	3 0.42 0.23 1 0.50 0.18	3 0.42 0.23 1 0.50 0.18	
1987-1991	10 0.60 1.65	11 0.52 1.75	7 0.71 0.72	17 0.38 1.63	17 0.40 1.71	

Source: BIS. (1) For each rate and period: in the first column, number of variations; in the second, average variation (in absolute value), expressed in percentage points; in the third, standard deviation. - (2) Excluding January.

Table 5b

**VARIABILITY OF SHORT-TERM MARKET INTEREST RATES
AND OF THE RESPECTIVE DIFFERENTIALS WITH GERMAN RATES (1)**

	Belgium	Denmark	France	Ireland	Italy	Netherlands
1987 (2)	0.02 0.03	0.05 0.06	0.03 0.04	0.09 0.09	0.06 0.06	0.02 0.02
Aug.-Nov.	0.02 0.04	0.05 0.06	0.04 0.06	0.08 0.09	0.07 0.09	0.04 0.04
1988	0.02 0.03	0.04 0.05	0.05 0.06	0.06 0.07	0.04 0.05	0.02 0.03
Aug.-Nov.	0.02 0.03	0.04 0.04	0.06 0.07	0.07 0.08	0.03 0.05	0.02 0.03
1989	0.03 0.04	0.08 0.08	0.06 0.05	0.06 0.07	0.04 0.06	0.05 0.04
Aug.-Nov.	0.03 0.04	0.08 0.07	0.06 0.06	0.06 0.06	0.04 0.05	0.03 0.03
1990	0.02 0.03	0.06 0.06	0.05 0.05	0.07 0.07	0.11 0.12	0.03 0.03
Nov.-Dec.	0.04 0.06	0.06 0.07	0.04 0.05	0.06 0.07	0.15 0.14	0.04 0.04
1991	0.03 0.03	0.05 0.05	0.05 0.05	0.05 0.05	0.08 0.09	0.02 0.02
Nov.-Dec.	0.03 0.03	0.06 0.05	0.05 0.05	0.03 0.05	0.11 0.11	0.02 0.02
1987-1991	0.02 0.03	0.06 0.06	0.05 0.05	0.07 0.07	0.06 0.08	0.03 0.03

Source: BIS. (1) For each country, the two columns refer to daily average change (absolute value) in respectively the interest rate and the differential with respect to German interest rates. - (2) Excluding January.

however small, in market interest rates in the countries most affected by speculative pressures.

France is a particularly interesting case: in several instances, facing pressure on the franc, the French authorities tried to avoid raising interest rates by resorting initially to the other two instruments. Subsequently, however, the persistence of tensions forced them to tighten their monetary policy. Such circumstances occurred in six of the seven episodes involving the French franc (episodes 2, 4, 6, 7, 8 and 9); in four of these, French authorities had to alter official rates in the final part of the period against unchanged official rates in Germany (in one case these were reduced); this provided a clear signal to the market, allowing the monetary authorities to bring a halt to tensions with an increase in market interest rates that was presumably lower than might have otherwise been needed.

The Italian authorities also tended to change interest rates after first relying on the other two instruments, especially intervention in the foreign exchange market. In the period following entry into the narrow band, relatively large increases in market interest rates were necessary to end tensions. In one case (episode 9), the Italian authorities countered pressures with an increase in the official rate on fixed advances, while German rates remained unchanged.¹³

The central banks of the countries whose currencies are more closely tied to the DM (the Netherlands and, from 1990, Belgium) made ample use of interest rate changes. The Dutch central bank, which systematically followed German monetary policy, needed only to allow a small but early increase in the interest rate differential with Germany in some episodes of tension. The Belgian central bank on several occasions relied mainly on interest rate changes to defend its currency. In particular, in December 1989 (episode 7), the Belgian

¹³ The discount rate increase in March 1989 (during episode 5) was mainly decided on the basis of domestic rather than external reasons.

authorities reacted with an increase of 0.4 percentage points in market interest rates during the first four days of tension; in December 1990 (episode 8) they countered an initial weakening of the currency with a significant interest rate increase (about 1 point), as tensions began to sharpen.

In the last three years of the period considered the Irish authorities also made greater recourse to interest rate increases. In episode 7, at the end of 1989, they used this instrument with particular firmness, raising the intervention rate by 1 percentage point on the first day of the phase of stronger tensions; this dissipated pressures on the punt with little effect on market rates and without the need for exchange market interventions. By contrast, the increase in the official rate in episode 8, at the end of 1990, followed a series of small interventions; the increase in market interest rates almost entirely preceded that in the official rate, contrary to what had happened in the previous episode. The experience seems to indicate that an early increase in official interest rates may ease tensions more rapidly and at lower cost in terms of the rise in market rates.

2.3 Combinations of instruments in the strategies of the various countries

The examination of the use of the three instruments reveals differences in the combinations adopted by the various countries in the 1987-1991 period. This section analyzes the different strategies and modifications to them during the period considered.

Belgium is a useful point of reference, as it implemented a radical change in strategy. During most of the eighties the Belgian franc was kept close to its central rate with the French franc, the Danish krone and the Irish punt, within a group which some describe as a sort of "soft currency area",

compared with a "hard currency area" centred on the DM.¹⁴ In the latter part of the decade, however, Belgian monetary and exchange rate policies were gradually modified. From mid-1988 the timing, direction and amount of changes in Belgian official rates began to mirror those in German rates. In 1990 fundamental decisions were taken regarding exchange rate policy; in March the two-tier market was abolished and in June Belgian authorities officially announced their new policy orientation: the Government committed itself to linking the Belgian franc more tightly to the System "anchor" currency, in particular promising to maintain the central rate unchanged in case of realignments.¹⁵ The Belgian central bank demonstrated its determination to defend this policy at the end of 1990, when the Belgian franc was subjected to speculative pressures: a deviation of the exchange rate from the central rate against the DM was avoided with a firm increase in market interest rates as soon as tensions emerged. The Belgian currency subsequently moved parallel to the DM, and for long periods was the strongest currency of the System, even during phases of tension. The linking of the Belgian monetary and exchange rate policy to German policy seems to have sheltered the Belgian franc from speculation, notwithstanding a number of weaknesses in the Belgian economy (in particular the high public debt ratio).¹⁶

In consideration of the low inflation rate and the cyclical slowdown in the last two years of the period, authorities in France adopted a strategy aimed at reconciling a relatively expansionary monetary orientation with the defence of the franc's central rate. During quiet periods in the EMS, official rates were reduced, with German rates remaining unchanged or rising. This occurred in the first half of 1987 (French official rates were reduced in April and in June, while

¹⁴ See A. Weber, "EMS Credibility", Economic Policy, No. 12, 1991, pp. 57-102.

¹⁵ See National Bank of Belgium, Report 1990, Brussels, pp. XX-XXI.

¹⁶ In some phases of the recent EMS crisis, however, also the Belgian franc has again been interested by speculative pressures (section 3).

German rates remained unchanged), in the first part of 1988 (they were reduced three times, with unchanged rates in Germany) and in 1990 (in April and October, with the latter case coming a few weeks after an increase in German rates). This behaviour sometimes contributed to generating pressure on the French franc, which eventually forced the French authorities to modify their policy orientation by increasing interest rates, generally after first using the other two instruments. This has involved, as mentioned in the previous two sections, extensive use of the fluctuation band (the franc approached its lower limit several times), large intramarginal interventions and a relatively high number of official rate increases during the episodes of tension (the signalling content of these rates is particularly helpful when, as in the case of France, the use of interest rates comes late or against the trend of the initial phase of tension). From the end of 1991, however, French authorities adopted a different strategy. In the first half of 1992, the conduct of monetary policy was very cautious, notwithstanding the further slowdown in economic growth and the relatively quiet conditions in the EMS. Official rates were not changed; short-term market rates remained practically stationary at levels slightly lower than those reached in late 1991 and early 1992; the franc's exchange rate strengthened considerably, rising to the higher part of the band. On the other hand, subsequent experience (from September 1992 to August 1993) shows that methods and timing in the use of the monetary instrument during periods of tension have not changed substantially (section 3).

Monetary policy developments in Denmark share some features with the French experience: the Danish authorities also facilitated a decline in interest rates during most of the period considered, imposing temporary restrictions to combat episodes of speculative pressure on the krone. This contributed to the emergence of tensions, especially in 1989. The strategy of the Danish authorities was mainly based on a very flexible use of the fluctuation band: the exchange rate was allowed to fall in the initial part of the episodes of

tension, on three occasions reaching the lower limit; only subsequently did they intervene in the foreign exchange market, almost exclusively at the margin, and induced a rise in market interest rates.

In Italy, monetary authorities followed a strategy marked by substantial continuity. In most episodes of tension involving the lira, the authorities initially allowed the currency to depreciate, although without letting it approach the lower limit. The Bank of Italy generally made intramarginal interventions, often quite large, and subsequently raised market interest rates to a significant degree. In general, increases in market rates were effected through temporary open market operations; as mentioned, the discount rate was increased once during an episode of tension, while German official rates were unchanged.

In Ireland, the monetary authorities allowed the punt to fluctuate only to a limited extent, near the centre of the band: only during the period of tension at the end of 1989 was the punt close to the lower limit for a significant number of days. Pressures on the Irish currency during the episodes of tension were countered both with interventions in the foreign exchange market and with interest rate increases. The latter instrument was used more intensively towards the end of the period considered. During the episodes in late 1989 and 1990, Irish authorities countered speculative pressures mainly through increases in market and official rates: the effectiveness of these manoeuvres was discussed in section 2.2.

3. The recent EMS crisis: a comparison with past experience

This section analyzes the use of the Basle-Nyborg instruments between June 1992 and August 1993, when, unlike in 1987-1991, they appeared to be largely insufficient to counter speculative pressures, which caused five realignments in eight months and eventually led to the widening of the fluctuation

band for all ERM currencies.

Tensions, which began after Denmark's rejection of the Treaty on European Union in a referendum on the 2nd of June, were subsequently fueled by the uncertainty surrounding the outcome of the referendum on the same issue in France, scheduled for the 20th of September: the prospects for monetary union, which in the past had played an important stabilizing role in the EMS, generated strong expectations of a realignment, which increased as the referendum date drew closer. Subsequently, parliamentary elections in various European countries provided new "critical" dates on which market expectations could focus. Furthermore, there was an increase in the markets' awareness of the conflict between the domestic needs of monetary policy and those connected with the defence of the exchange rate, especially in France. Encouraged by the initial success, speculative pressures progressively extended to currencies such as the Irish punt and the Danish krone, which showed no particular factors of weakness and whose central parity were in line with the countries' economic fundamentals.

The crisis period is schematically outlined in six phases of tension in the second part of the Appendix: a) June-July 1992, following the referendum on European Union in Denmark; b) August-September 1992, with the exit of the British and Italian currencies from the ERM; c) September-October 1992 and d) November 1992-February 1993, when speculative attacks occurred against the French franc, the Danish krone and the Irish punt, with the latter being devalued; e) February-March 1993, when pressures were exerted on the Danish krone and, for the first time since 1990, on the Belgian franc; f) July 1993, when violent tensions re-emerged, particularly involving the French franc, which led to the widening of the ERM fluctuation band on August 2.

The three instruments for defending exchange rates were used intensively:

- a) As in 1987-1991, the scope for exchange rate fluctuations within the band was used extensively, even by countries which had exploited it to a lesser extent in the earlier period. The use of this instruments was successful in the countries which had already used it effectively to penalize speculative positions; by contrast, it was ineffective or counterproductive where its utilization was exceptional in the light of previous experience, being interpreted as a sign of the authorities' difficulty, rather than as a change in their strategy.
- b) Interventions in the foreign exchange market reached unusually high levels compared with 1987-1991. In general, they continued to be insufficient to dissipate tensions when as in the previous period they were carried out by the weak-currency countries alone; they were effective when they were coordinated, in some cases making a decisive contribution to eliminating tensions.
- c) Interest rate increases, that had generally been decisive in halting tensions in 1987-1991, were insufficient and in some cases counterproductive during this crisis, even though they were often much larger than in the earlier period. Given the recession in Europe, in most countries they appeared in conflict with domestic monetary policy needs and were hence considered unsustainable.

The use of untested instruments not explicitly provided for in the Basle-Nyborg agreement - coordinated intramarginal interventions and joint statements by the authorities of different countries - was particularly effective in some cases. However, the use of these instruments affected only some of the currencies involved in the tensions and did not eliminate the markets' perception of a lack of overall coordination.

In general, the strategies adopted in the various countries were substantially similar to those adopted in 1987-1991. In some cases, however, authorities faced by exceptionally severe tensions made greater recourse to

instruments that they had not fully exploited in the previous period.

The strategy adopted in France shared features with that used in the previous period, especially as regards the timing of the use of the three instruments. During the three main phases of pressure on the franc (in the week preceding the 20th of September referendum and the following week; between the end of November and the beginning of 1993; in July 1993) they initially reacted by letting the currency depreciate, although without allowing it to reach the lower limit, and by carrying out intramarginal interventions of exceptional size. Only subsequently - respectively in the week following the September referendum, in the first few days of 1993, and at the end of July 1993 - did they intensify their use of interest rates: in the first case the intervention rate was increased by 2.5 percentage points; in the other two episodes 5-10 day repurchase operations were suspended and replaced by overnight operations at a rate which was increased by 2 and 2.25 percentage points respectively. These measures were announced simultaneously with a joint declaration by the French and German authorities supporting the existing parities and accompanied by intramarginal interventions by the two central banks.

This strategy was effective in the first two phases of tension, largely thanks to this coordination. The participation of the German authorities surprised the market, since the Bundesbank had never made interventions of this type and size in the entire history of the EMS. In the last phase of tension, in July 1993, the action of the French authorities eased tensions only temporarily: after the Bundesbank's decision not to reduce the discount rate at the end of the month, speculative movements reached uncontrollable dimensions, leading to the decision to widen the ERM fluctuation band. The Bundesbank's attitude on this occasion showed the limits of coordination between the authorities of the two countries, which had previously appeared very strong, and heightened the

market's perception of the conflict between the domestic needs of French monetary policy and the defence of the exchange rate.

In Denmark, the authorities primarily based their strategy on the use of the fluctuation band and changes in interest rates. On two occasions the krone was also supported with coordinated interventions, both at the margin and intramarginal, by several EMS central banks. Speculative pressures began soon after the 2nd of June referendum; the authorities reacted by allowing a modest depreciation of the currency and immediately increasing the intervention rate. In November 1992, in the face of the strong tensions that had developed in the EMS after the decision of the Swedish authorities to abandon the unilateral peg to the ECU, the Danish authorities allowed the krone to reach the lower limit of the band, while at the same time increasing the intervention rate by more than 5 percentage points; they subsequently made modest interventions at the limit. The manoeuvre was effective: the krone's fall to the lower limit induced Danish residents to sell foreign currency, partly offsetting the sale of krone by non-residents. This is partly explained by past experience (section 2.2), in consideration of which the market discounted the risk that the krone depreciation would be followed by a subsequent appreciation. In fact, the krone's divergence from the central rate against the DM returned to its initial value about one month after reaching the bottom of the band. In the next two phases of tension, in February and July 1993, the krone was again allowed to fall to the lower limit; the Danish authorities also made interventions at the margin and raised the policy rates by about 2 percentage points. Coordinated marginal and intramarginal interventions were carried out by other EMS central banks. The interventions surprised the market, contributing to an easing of tensions. In the February episode the reduction of German official rates was also decisive.

In Italy the authorities made greater use of the scope for fluctuation within the band; in addition, not only did they

increase market interest rates, but also official rates; on the whole, the timing of the use of the three instruments did not differ substantially from the past. The lira was subjected to four successive phases of tension:

- Soon after the Danish referendum on the 2nd of June the Italian authorities allowed a significant depreciation of the lira, only partly countered with interventions in the foreign exchange market; on the 4th of June they increased the rate on fixed advances by 0.5 percentage points; tensions continued until the middle of the month, countered with large interventions and an increase in market interest rates.
- After a short period of calm, pressures mounted again in the first days of July; they were initially countered mainly with large interventions in the foreign exchange market; on the 5th of July the discount rate and that on fixed advances were increased, by 1 and 1.5 percentage points respectively; tensions weakened temporarily.
- A new phase of tensions began around the 9th of July; the lira was allowed to depreciate further and large interventions were made in the foreign exchange market; the discount rate was increased by 0.75 percentage points on the 16th of July, in conjunction with the raising of German official rates. Pressure diminished the following week and the discount rate was reduced at the beginning of August.
- Italian authorities initially reacted to renewed speculative pressures in mid-August by allowing a further depreciation of the lira, which reached the lower limit for the first time since its entry into the narrow band. The manoeuvre did not discourage speculation and from the end of August onwards the authorities intensified their use of the other two instruments, making large interventions and encouraging a further rise in market interest rates; the discount rate was raised by 1.75 percentage points on the 4th of September. On the 14th of September the lira was devalued. Three days later, following new tensions that initially involved the British pound and then spread to the

lira, the Italian authorities decided to suspend interventions at the margin, the same day the United Kingdom withdrew from the ERM.

In Ireland, the authorities adopted a combination of instruments featuring wider use of exchange rate movements within the band, compared with the past, and a firm use of interest rate increases, following the orientation adopted in the final part of 1987-1991. The punt first touched the lower limit in September 1992 and then hit bottom repeatedly between the end of November and January 1993. In contrast to the Danish experience, this manoeuvre appears to have had a perverse effect: the reaching of the lower limit, which was unusual in the light of past experience (section 2.3), was probably interpreted by the market as a sign of the authorities' difficulties, rather than as a change in their strategy, thus affecting the perceived riskiness of speculative positions in a direction opposite to that desired. In September 1992 the Irish authorities encouraged a rapid increase in short-term market rates (more than 7 percentage points), while at the same time strengthening controls on capital movements. To combat a the new phase of severe tensions between November 1992 and the first part of 1993, they used the interest rate on overnight refinancing facilities in a very flexible way, raising it to 100 per cent on two occasions. Interventions were modest. However, these measures were not enough to avoid the realignment of the punt on the 1st of February.

The monetary authorities in Belgium also had to counter speculative pressures. The Belgian franc, which had remained sheltered from speculation throughout 1992, was subsequently affected by tensions for the first time since the end of 1990 in February, March and July 1993. The authorities primarily reacted by altering the policy rates by growing amounts in the three episodes (about 0.5, 2.75 and 4.5 percentage points, respectively). They also made relatively modest exchange market interventions; the Dutch central bank also made intramarginal interventions in support of the Belgian franc in July.

APPENDIX

A1. Main episodes of tension between the January 1987 realignment and the end of 1991¹⁷

- Episode 1 - August-September 1987 (3.8-11.9)
- Episode 2 - October-November 1987 (26.10-6.11)
- Episode 3 - August-September 1988 (11.8-8.9)
- Episode 4 - October 1988 (7.10-21.10)
- Episode 5 - January-March 1989 (24.1-23.3)
- Episode 6 - September-October 1989 (8.9-20.10)
- Episode 7 - November-December 1989 (14.11-29.12)
- Episode 8 - November-December 1990 (6.11-19.12)
- Episode 9 - October-December 1991 (18.10-24.12)
- Episode 10 - April-August 1990 (18.4-10.8)
- Episode 11 - March-June 1991 (11.3-17.6)

A2. Phases of tension between June 1992 and August 1993

- Phase A: June-July 1992 (2.6-24.7)
- Phase B: August-September 1992 (10.8-16.9)
- Phase C: September-October 1992 (17.9-16.10)
- Phase D: November 1992-February 1993 (19.11-1.2)
- Phase E: February-March 1993 (1.2-31.3)
- Phase F: July-August 1993 (8.7-2.8)

¹⁷ Episodes 10 and 11 are out of chronological order because they differ substantially from the others (see footnote 5).

A1. Main episodes of tension between the January 1987 realignment and the end of 1991

Episode 1: August-September 1987 (3.8-11.9)

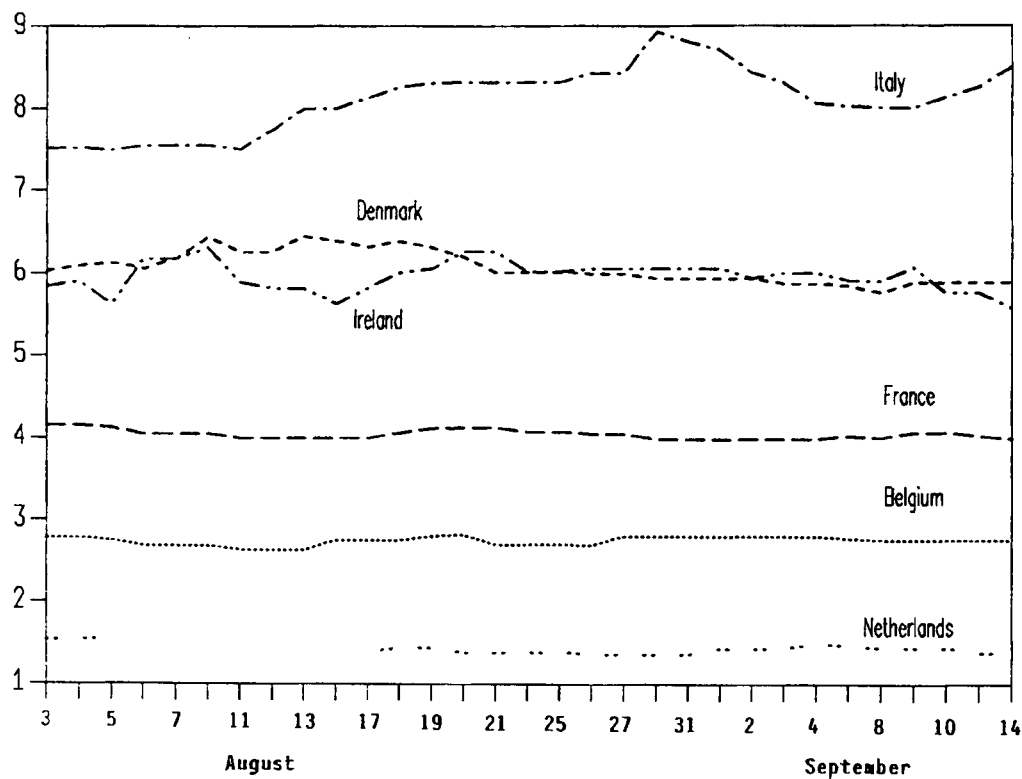
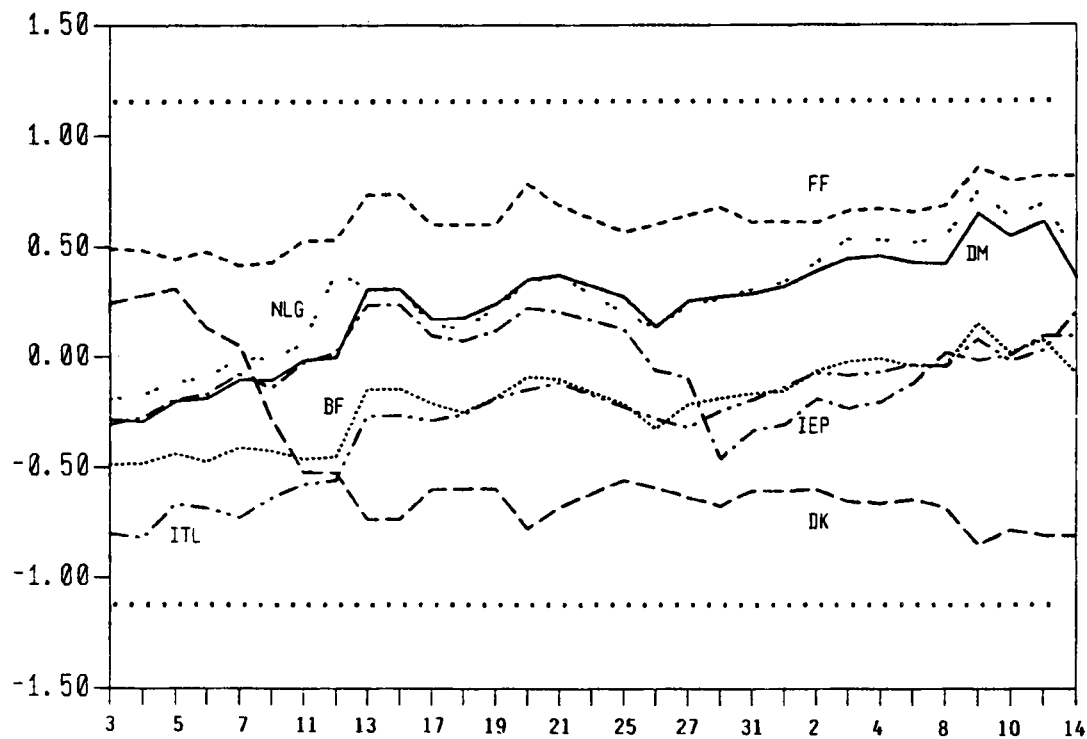
Factors of tension - The depreciation of the dollar with respect to the DM (about 6 per cent between mid-August and the first ten days of September) contributed to the development of tensions.

Summary - During this episode, immediately preceding the Basle-Nyborg agreement, the authorities' behaviour was significantly different, on the whole, from that found in the subsequent episodes, particularly as concerns the use of the fluctuation band. Only the Danish authorities allowed the currency to depreciate significantly; the others adopted a strategy which aimed at maintaining positions vis-à-vis the DM substantially unchanged. To this purpose they relied mainly on interventions in the foreign exchange market, for modest amounts in Belgium and in Ireland, larger in France and Italy; interest rates did not record significant changes, except in Denmark and Italy.

Chronology - In the first half of August there was a significant depreciation of the krone (1.6 per cent against the DM), only partly countered by the Danish authorities with an increase of short-term interest rates (about 0.5 percentage points). The Belgian and French authorities made modest interventions, maintaining exchange rates against the DM substantially unchanged. Also the Italian authorities prevented the lira from depreciating, with significant interventions and subsequently by an increase of about 1.5 percentage points in short-term interest rates. In the second part of the episode, at the end of August, the tensions involved the Irish punt, which moved below the centre of the band: the Bank of Ireland made modest interventions until the exchange rate started rising again and the currency moved back above the centre of the band. The French franc remained the strongest currency in the System, sustained by relatively large interventions in the foreign exchange market of the Bank of France in September. The lira moved parallel to the DM in the band, supported mainly by interventions; interest rates, which had diminished in the first week of September, went up again in the following week.

ERM FLUCTUATION BAND AND SHORT-TERM INTEREST RATE DIFFERENTIALS WITH GERMANY

EPISODE 1: AUGUST-SEPTEMBER 1987 (3.8-11.9)



Episode 2: October-November 1987 (26.10-6.11)

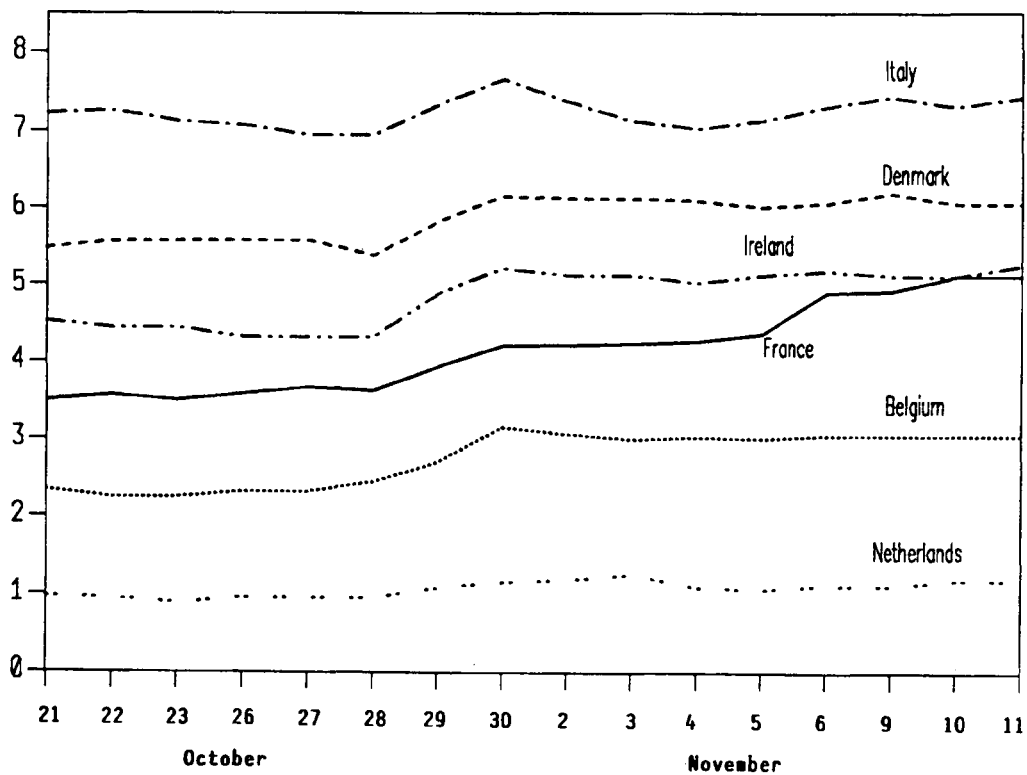
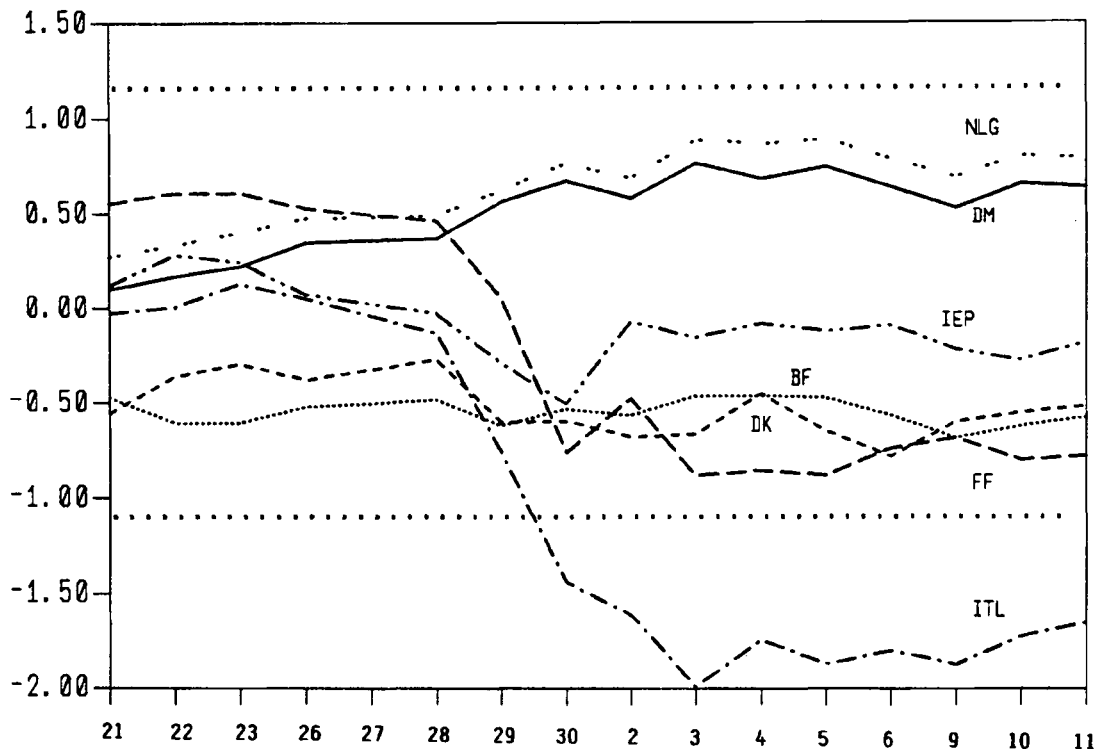
Factors of tension - Tensions were partly connected with the depreciation of the dollar, which started at the beginning of October and accelerated following the New York Stock Exchange crash (19 October), notwithstanding concerted heavy interventions by the main central banks.

Summary - This episode is particularly important: it began just few weeks after the conclusion of the Basle-Nyborg agreement and was characterized by great flexibility and coordination in the use of instruments, consistent with the agreement's recommendations. Tensions mainly affected the French franc and to a lesser extent the other ERM currencies, with the exception of the Dutch guilder. French authorities initially allowed a significant depreciation of the franc with respect to the DM, at the same time making large intramarginal interventions, partly financed with recourse to the very short-term financing facilities (VSTF); they did not modify interest rates. Meanwhile, the rate on temporary open market operations (repos) was slightly reduced in Germany. Such measures, however, were insufficient to eliminate the tensions, which ended only after the concerted manoeuvre on official interest rates decided by the French and German authorities.

Chronology - The size of the bilateral divergence between the DM and the other currencies, with the exception of the Dutch guilder, widened rapidly at the end of October. In a two-day period the French franc depreciated by 1.6 per cent against the DM, the Irish punt by 0.8, the Belgian franc and the krone by 0.5. In the same days the French authorities made large interventions, partly financed through the VSTF, while short-term interest rates remained unchanged. In Belgium and in Ireland, where pressures were weaker, the monetary authorities used these two instruments in more balanced fashion: interventions were modest, while short-term interest rates increased by 0.2 and 0.3 percentage points respectively; in Denmark there were no interventions and interest rates increased by 0.3 points. In Germany, following a small reduction of the rates on repos (ending a period of restriction that had lasted several months), short-term market interest rates recorded a significant decrease. In the wide band, the Italian authorities allowed the lira to depreciate by about 2 per cent at the end of October and in the first days of November, only partly countering this movement with modest interventions and very small interest rate increases.

Pressures on the French franc lasted until the first week of November, inducing the Bank of France to allow a further depreciation of the franc and to make new interventions, financed with recourse to the VSTF and bilateral swaps with the Bundesbank. Tensions, however, ended only after the coordinated manoeuvre on official interest rates, decided on the 5th of November. The two French official rates were raised by 0.75 points, while the German lombard rate was reduced by 0.5 points; in the following week French short-term market rates rose by about 0.7 points.

EPISODE 2: OCTOBER–NOVEMBER 1987 (26.10–6.11)



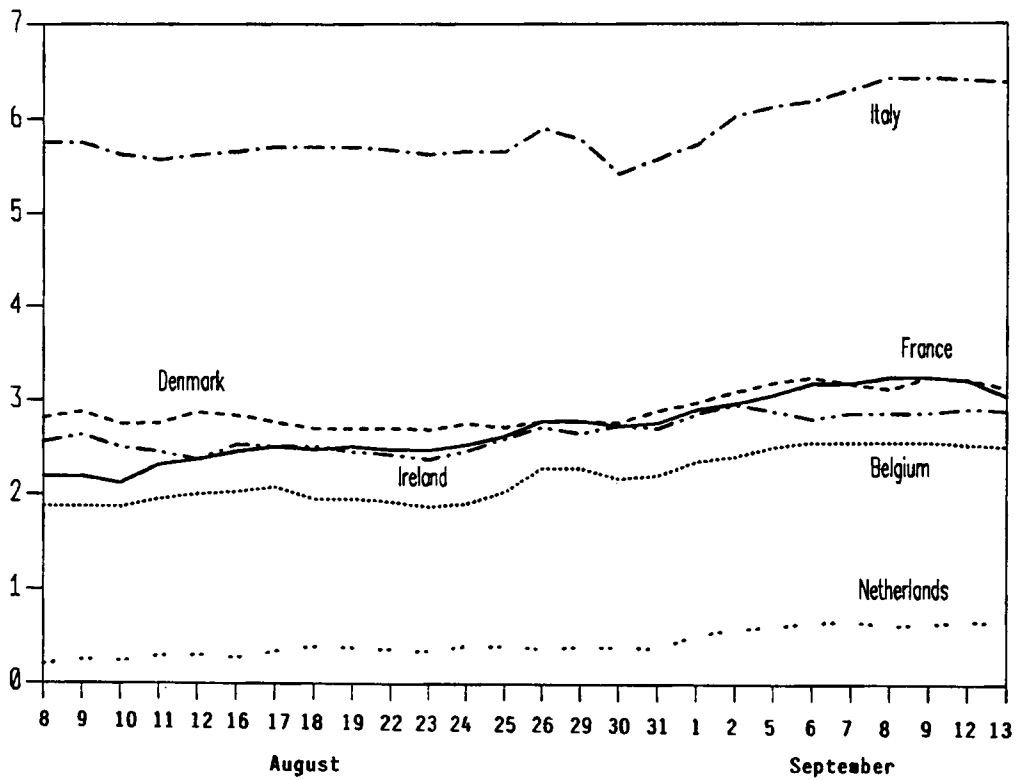
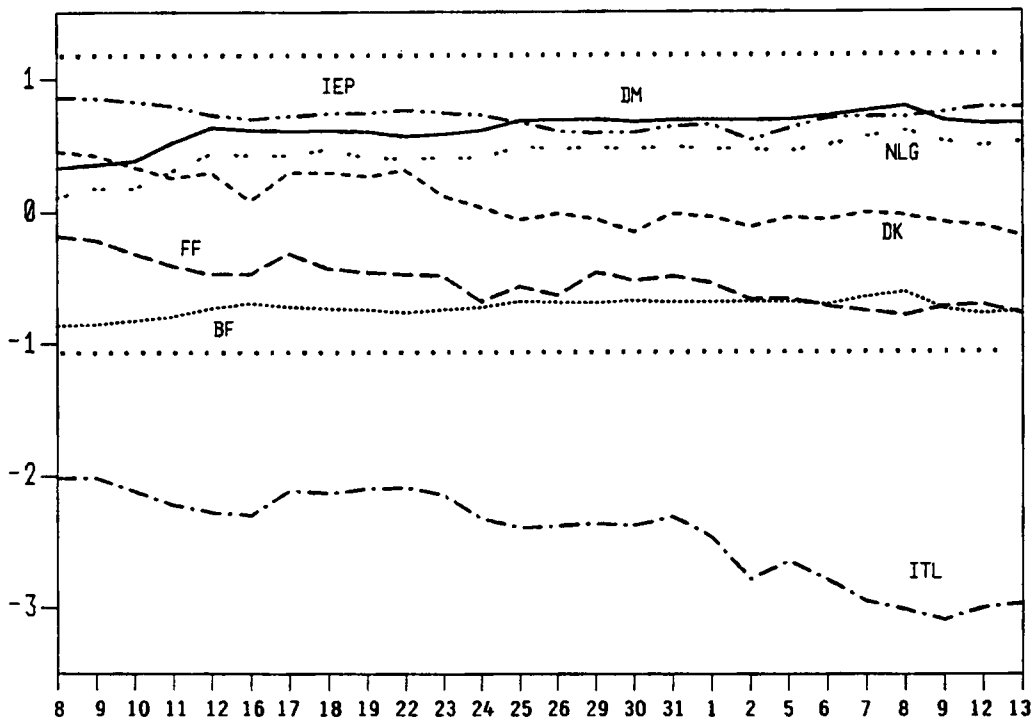
Episode 3: August-September 1988 (11.8-8.9)

Factors of tension - Tensions mainly reflected the differences in monetary policy stance: in July the French and the Danish authorities reduced their official rates, while the German, Belgian and Dutch official rates were increased twice; the Italian and the Irish authorities left them unchanged. At the end of July, in France, Denmark and Ireland differentials with respect to the DM were about 3 points less than at the beginning of the year, in Italy 1.5 points. Expectations of a further increase in German official rates, which emerged during this period, were confirmed by the Bundesbank's decisions on the 26th of August.

Summary - In August the Danish and French authorities allowed their exchange rates against the DM to decline; only the Bank of France partly countered the depreciation with an interest rate increase. The lira, in the wide fluctuation band, also recorded a depreciation, while the Italian authorities did not resort to the other two instruments. Only after a sharpening of tensions following a round of official rate increases did the French, Italian and Belgian authorities intervene in the foreign exchange market. The joint effect of the interventions and the variation in interest rate differentials (partly determined by a reduction of German rates) eliminated the tensions.

Chronology - Tensions emerged around the 10th of August. The Danish and the French authorities and, in the wide band, the Italian ones, allowed depreciation. The French authorities increased short-term market rates by about 0.5 percentage points over the next two weeks. The Belgian franc and the guilder, sustained by small but immediate interest rate increases, did not weaken against the DM. Tensions sharpened after the German discount rate increase on the 26th of August, even though the Italian and French authorities, as well as the Belgian and Dutch ones, had raised their own official rates on that occasion, resulting in an increase in market interest rates in the days that followed. Between the end of August and the first two weeks of September the Italian authorities allowed a further depreciation of the lira, meanwhile making relatively large interventions and continuing to increase short-term market rates. The French and Belgian authorities maintained their exchange rates unchanged by means of small interventions. A reduction in German monetary market rates in the first part of September helped to eliminate tensions.

EPISODE 3: AUGUST-SEPTEMBER 1988 (11.8-8.9)



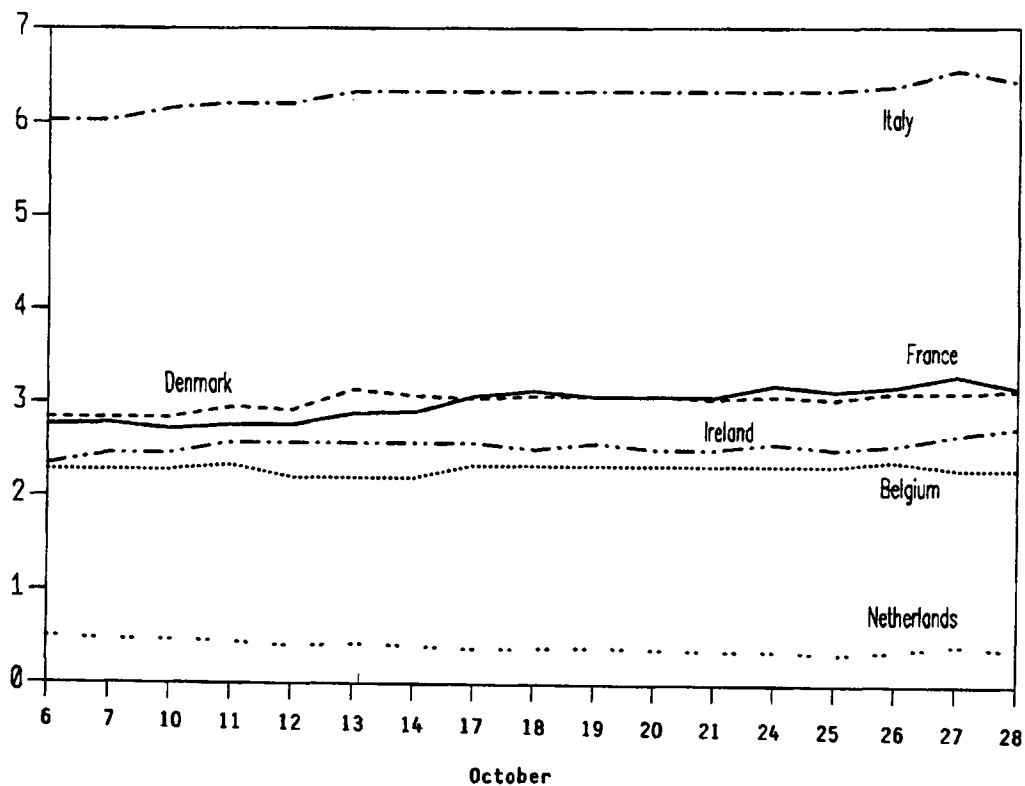
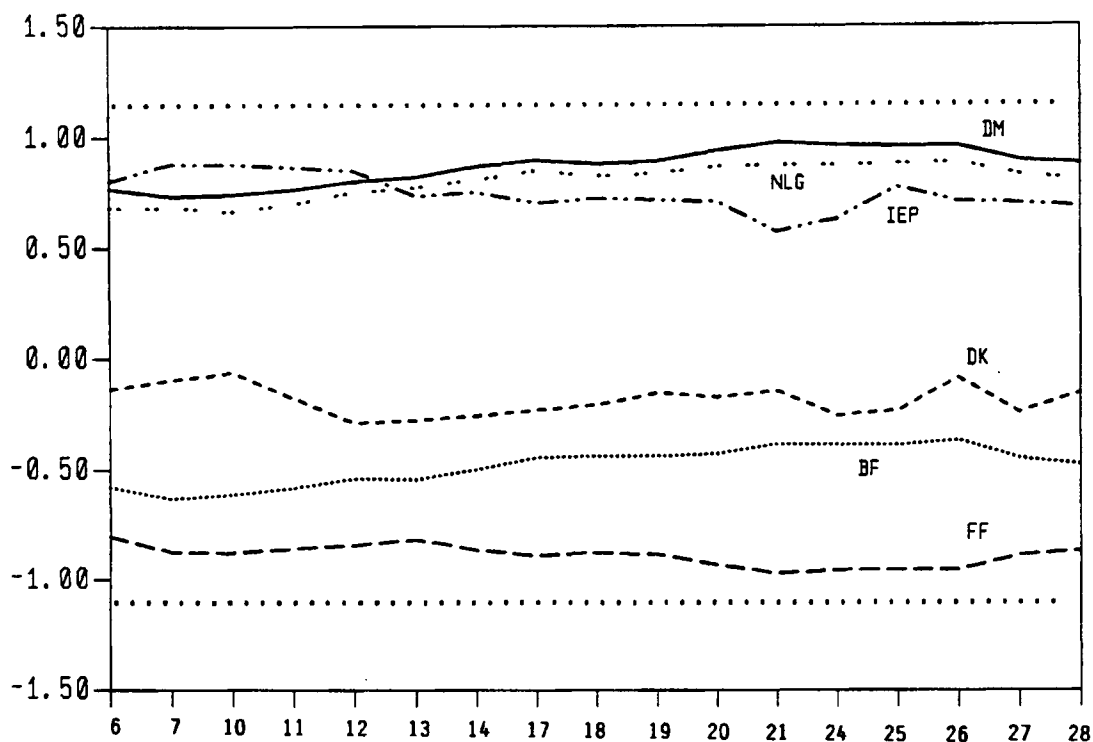
Episode 4: October 1988 (7.10-21.10)

Factors of tension - Between the second half of September and the beginning of October short-term interest rate differentials with Germany narrowed again, particularly in France.

Summary - Pressures mainly affected the French franc. The Bank of France initially intervened in the foreign exchange market; subsequently it allowed a depreciation of the franc, only partly countered with an interest rate increase; the tensions evaporated after an increase in the French intervention rate.

Chronology - During the first few days the French authorities countered pressures on the franc with large interventions in the foreign exchange market, maintaining interest rates nearly unchanged. In the following week they allowed a depreciation, at the same time slightly increasing short-term market rates. The French authorities' decision to raise the intervention rate on the 19th of October, and the consequent further small increase in market rates in the following days ended the tensions: the franc's divergence from its central rate with the DM continued to widen until the 21st of October but then narrowed. The Danish krone also depreciated briefly on the 11th and the 12th of October, countered by a small but immediate increase in short-term market rates.

EPISODE 4: OCTOBER 1988 (7.10-21.10)



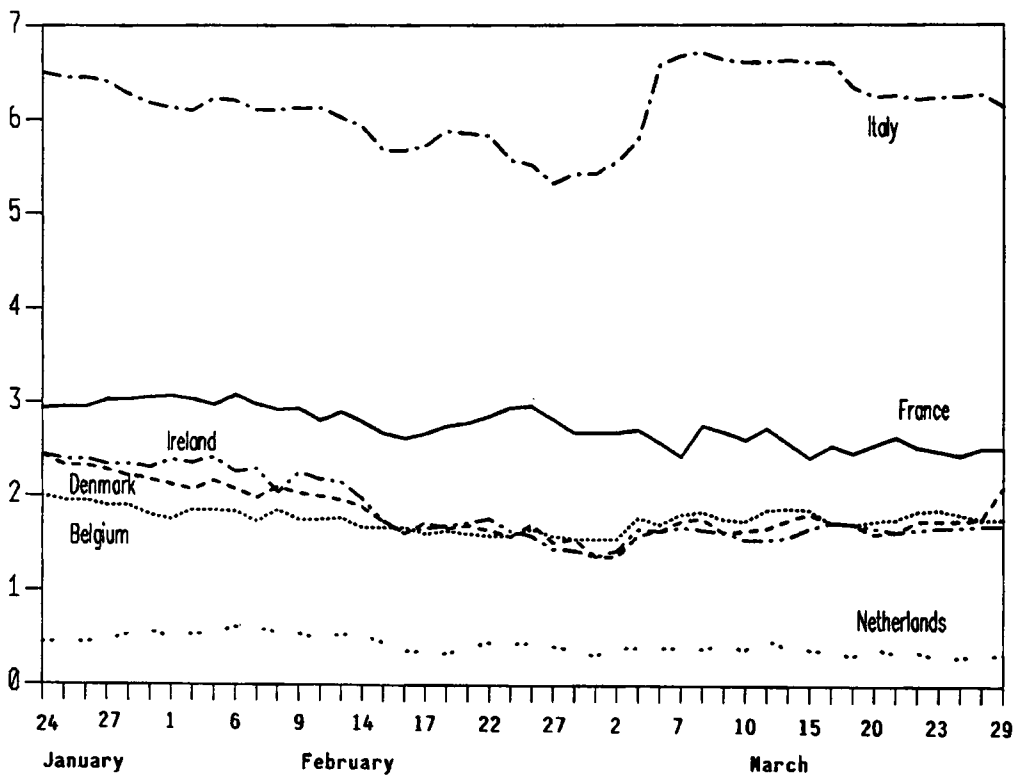
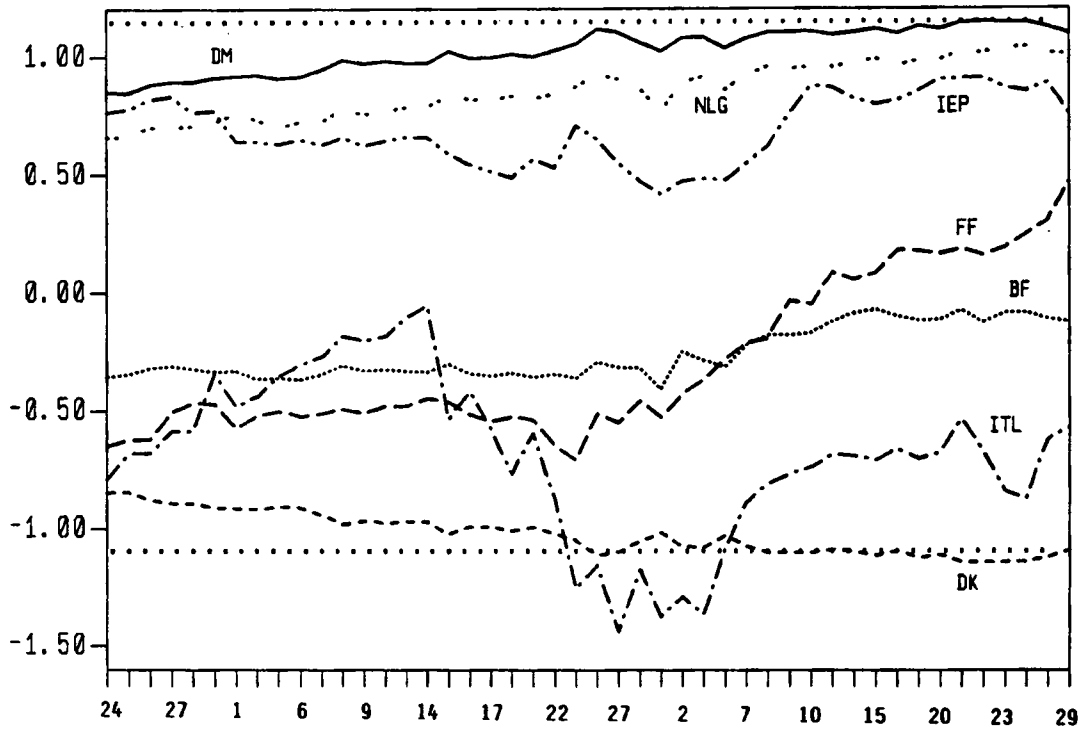
Episode 5: January-March 1989 (24.1-23.3)

Factors of tension - Tensions were connected mainly with the differences in the restrictiveness of monetary policies: the Danish authorities, in particular, did not follow the increases in official rates decided by the Bundesbank in December 1988 and January 1989. Between the end of December and the end of February 1989 the differential between Danish and German short-term market rates diminished by about 1.5 percentage points.

Summary - Tensions concentrated on the krone, which was already close to its lower limit to begin with. The Danish authorities did not intervene significantly in support of the krone until it reached the lower limit against the DM: the interventions at the margin then made by the Danish and the German central banks eliminated the tensions. The lira and to a lesser extent the Irish punt were also subjected to speculative pressures.

Chronology - The krone's depreciation, which started at the end of January, continued for some weeks without being countered by the Danish authorities. Only at the end of February, when it approached its bilateral limit of fluctuation with the DM, did they make small intramarginal interventions, while short-term market interest rates recorded a modest rise. The tensions sharpened in March, notwithstanding the reduction of the rate on repos of 0.4 percentage points decided by the Bundesbank in the second week of the month and the subsequent decline in German market rates. On the 23rd of March, when the krone reached the lower limit against the DM, the Danish and German central banks made interventions at the margin, which dissolved the tensions. The lira recorded a sharp depreciation against the DM (1.3 per cent) in the second half of February, falling below the lower limit of the narrow band from an initial position close to the centre of the band. Modest interventions and then an increase in short-term interest rates stopped the depreciation; this was definitively ended by an increase in the discount rate on the 6th of March (decided mainly for domestic rather than external reasons) and the following further rise of market rates (about three quarters of a point). The Irish authorities reacted to signs of weakness of the punt with small interventions in the foreign exchange market at the end of February; interest rates remained nearly unchanged.

EPISODE 5: JANUARY-MARCH 1989 (24.1-23.3)



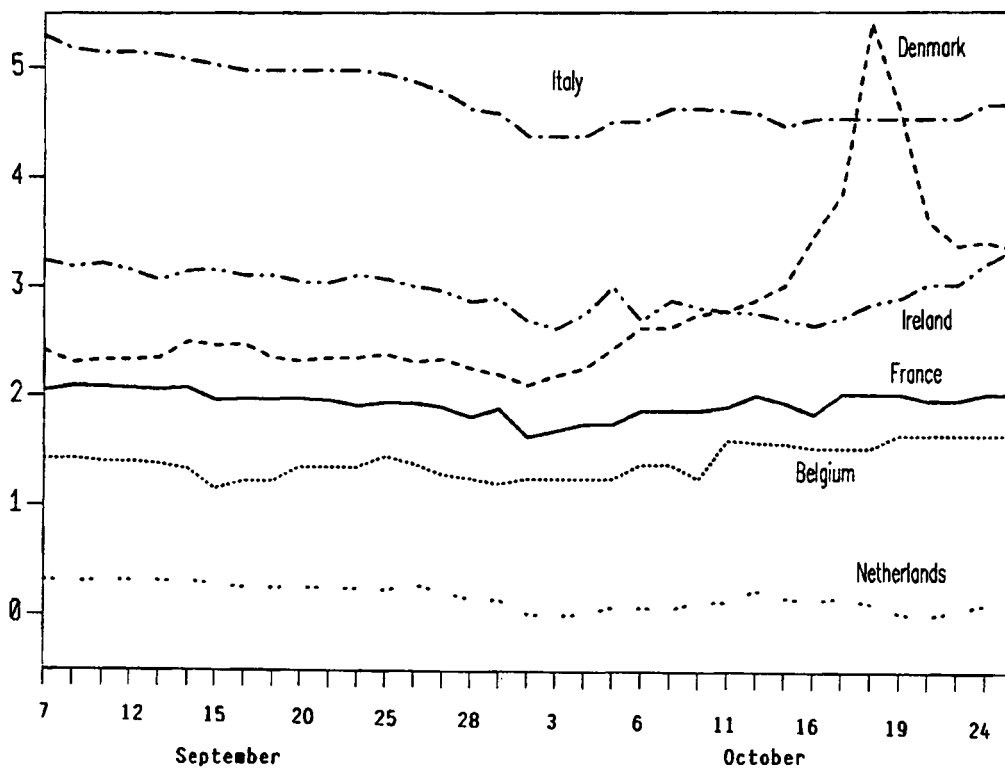
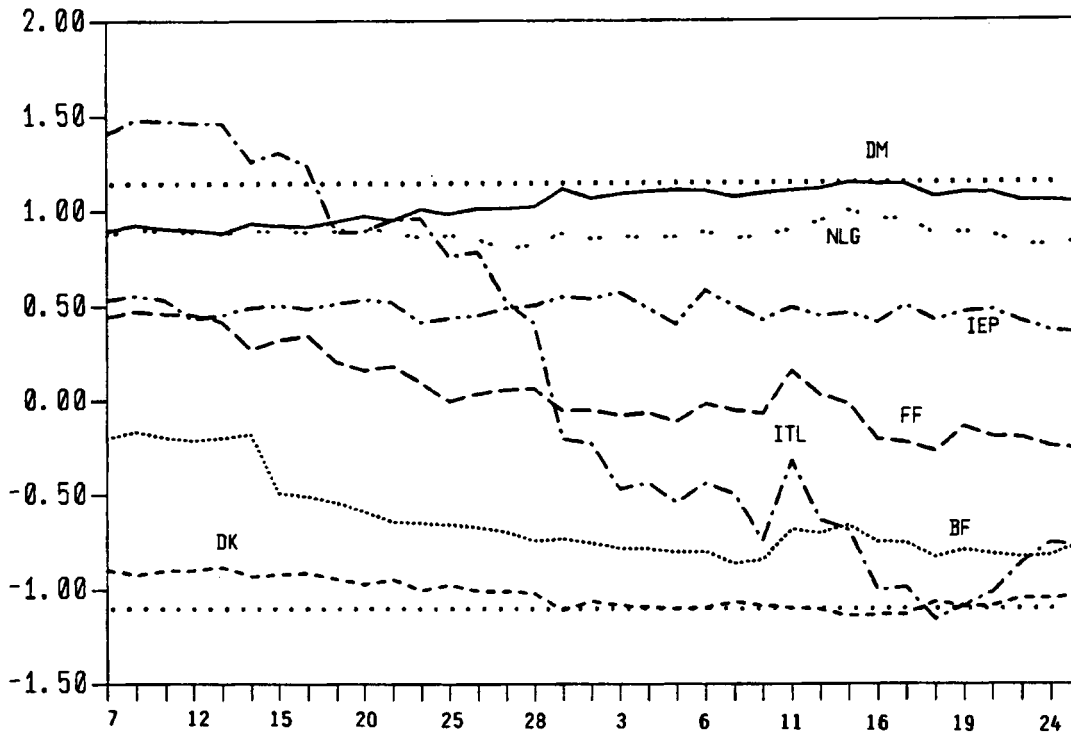
Episode 6: September-October 1989 (8.9-20.10)

Factors of tension - Tensions were partly connected with the weakening of the dollar, which depreciated by 8 per cent against the DM between mid-September and mid-October.

Summary - Tensions mainly affected the krone. The Danish authorities initially reacted with a significant increase in short-term market rates, allowing the exchange rate to sink to the lower limit of the band in the meanwhile. After making large interventions at the margin (almost entirely financed through the VSTF), the Danish central bank ended the tensions with a further large increase in market interest rates. The Italian authorities initially allowed the lira to depreciate significantly; then did they counter the decline, mainly through interventions in the foreign exchange market. The French and the Belgian central banks only partly countered the depreciation of their currencies, mainly through significant increases in short-term interest rates.

Chronology - The krone depreciated against the DM between the first half of September and mid-October, notwithstanding the Danish authorities' participation to the round of official rate increases on the 6th of October and the rise of more than 1 percentage point in short-term market rates. On the 13th of October the krone and the DM reached the limit of the bilateral fluctuation band; the interventions at the limit were virtually unilateral, with large interventions by the Danish central bank (mostly financed through the VSTF), and negligible action by the Bundesbank. The Danish authorities reacted to the persistence of pressures the following week with a further increase in short-term rates of more than 2 points, which allowed tensions to dissipate. During the second half of September the Italian authorities allowed a sharp depreciation of the lira, which fell from the upper limit of the narrow band to the lower limit, without making significant interventions and leaving short-term interest rates unchanged, as German rates were rising. They subsequently countered the depreciation with interventions in the foreign exchange market and small interest rate increases. The French and Belgian authorities only partly countered the depreciation in their currencies between mid-September and the beginning of October with an interest rate increase; they then favoured a more rapid increase in interest rates and made modest interventions in the foreign exchange market, stabilizing their exchange rates.

EPISODE 6: SEPTEMBER-OCTOBER 1989 (8.9-20.10)



Episode 7: November-December 1989 (14.11-29.12)

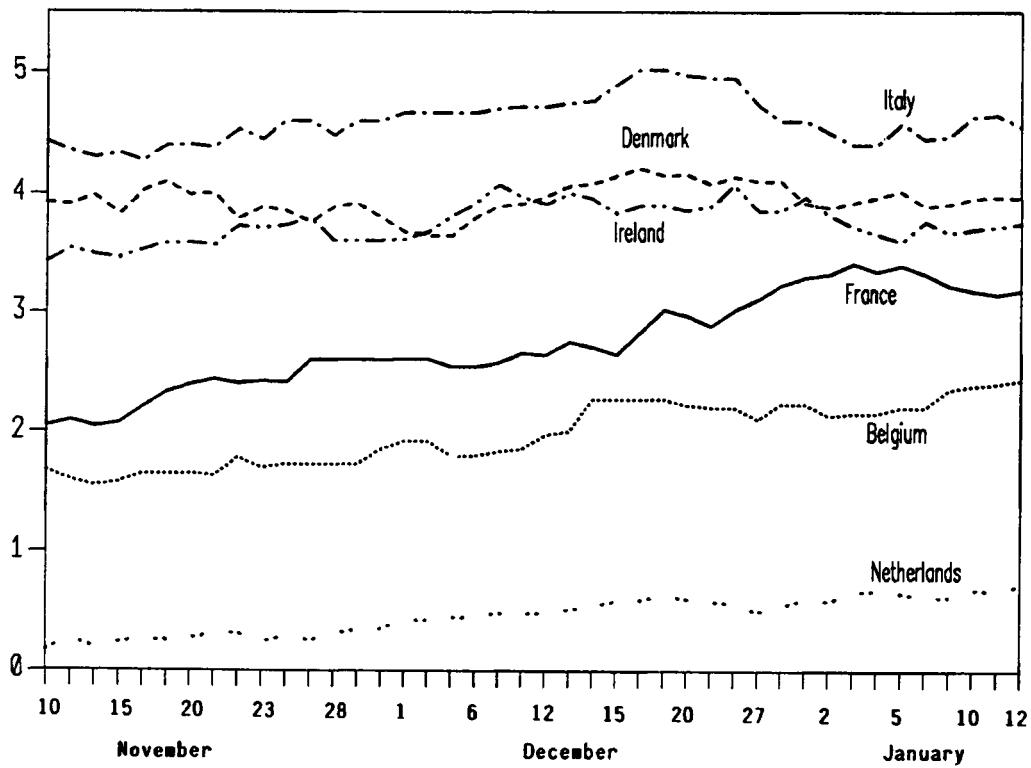
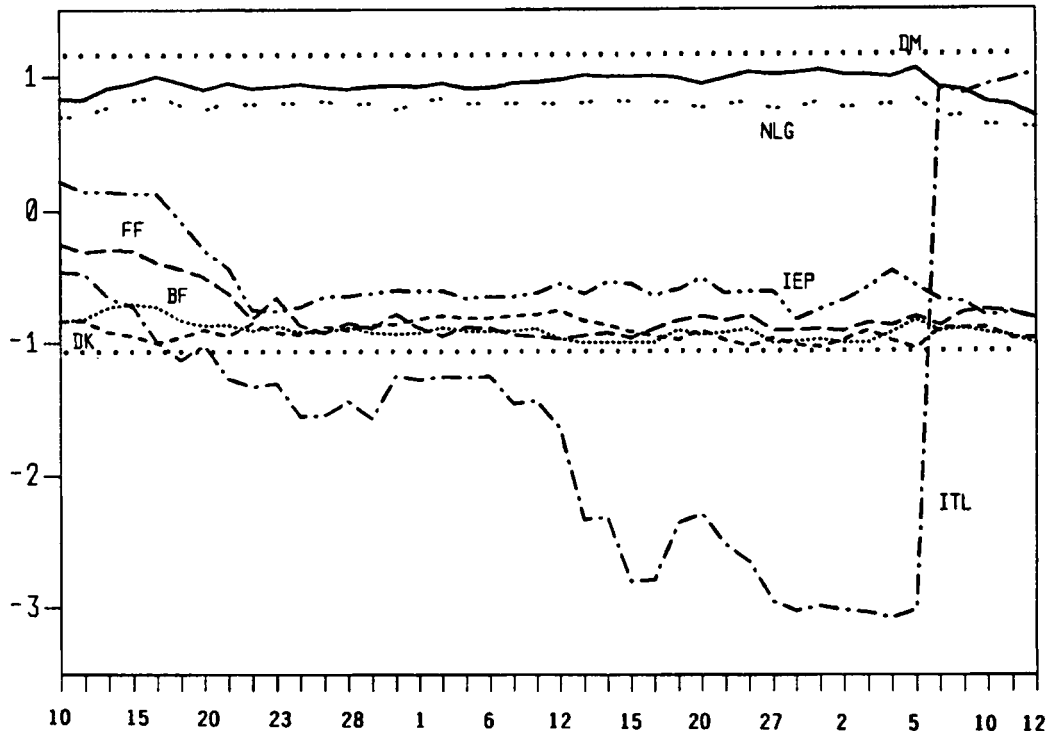
Factors of tension - Developments in the EMS were influenced by the depreciation of the dollar, which depreciated against the DM by a further 8 per cent between mid-November and the end of the year. Market expectations of a monetary policy restriction in Germany also emerged.

Summary - The DM and the Dutch guilder strengthened vis-à-vis the other EMS currencies. Initially the French authorities mainly exploited the possibilities of fluctuating within the band; they subsequently intensified interventions in the foreign exchange market and eventually decided to raise the two official rates, which played a decisive role in ending tensions. The Irish authorities partly countered the depreciation of the punt, first with an increase in market interest rates, and then with an increase in the intervention rate when more severe tensions began. The Belgian central bank reacted with a timely increase in market rates.

Chronology - An initial phase of tension occurred from the 14th to the 24th of November, when the French franc and the Irish punt depreciated against the DM by 0.5 and 0.8 per cent respectively, moving towards the Belgian franc and the Danish krone, which were already close to the lower limit of the band. The lira also weakened significantly, moving about half a point below the lower limit of the narrow band. Irish and French interest rates rose respectively by 0.3 and 0.4 points in this phase; the Bank of France intervened in the foreign exchange market. The Italian authorities made large interventions, while interest rates remained virtually unchanged.

Tensions became more severe between the 11th of December and the end of the year. The Belgian authorities primarily reacted with a rapid increase in market interest rates of 0.4 points between the 11th and the 15th, meanwhile making relatively modest interventions. In Denmark interest rates increased only slightly and there were no interventions. The French authorities initially made relatively large interventions, leaving short-term interest rates unchanged; these, however, recorded a significant increase (0.8 points) in the second half of the month, particularly after the 0.5 point increase in the intervention rate on the 18th of December, which had a decisive effect in ending tensions. The Irish authorities resorted only to the monetary instrument, raising the intervention rate by 1 point on the 11th of December, the first day of more intense pressures: short-term market rates, which had already recorded a small increase of 0.2 points in the days immediately preceding the decision, remained nearly unchanged in the days that followed; there were no interventions in the foreign exchange market.

EPISODE 7: NOVEMBER-DECEMBER 1989 (14.11-29.12)



Episode 8: November-December 1990 (6.11-19.12)

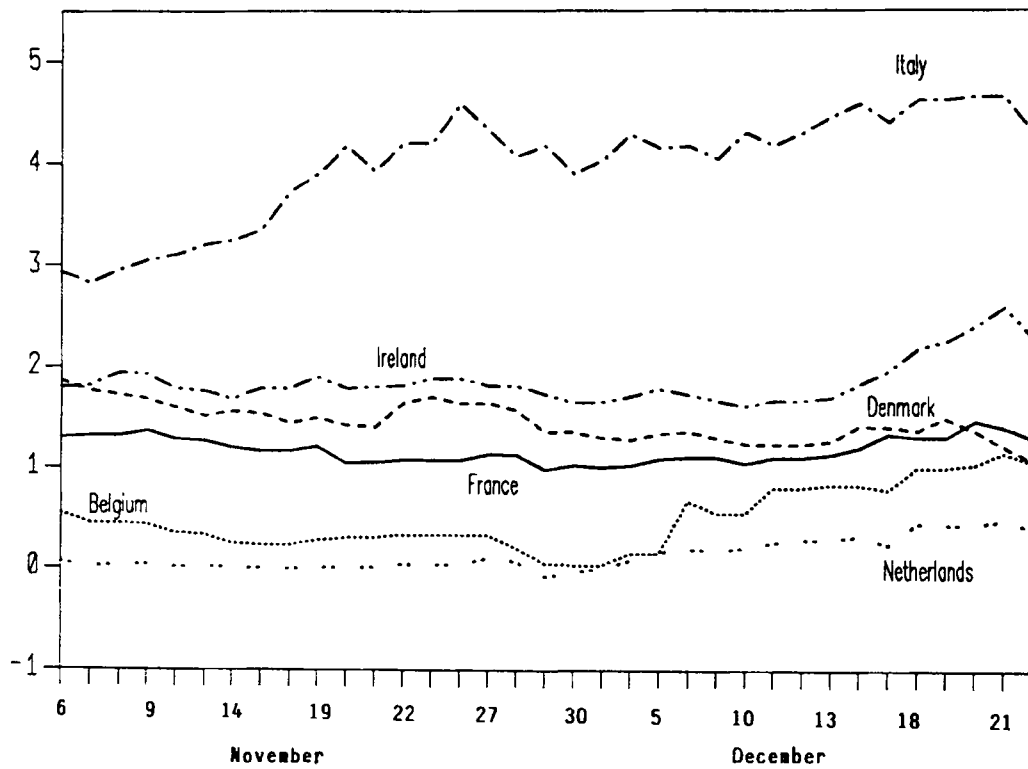
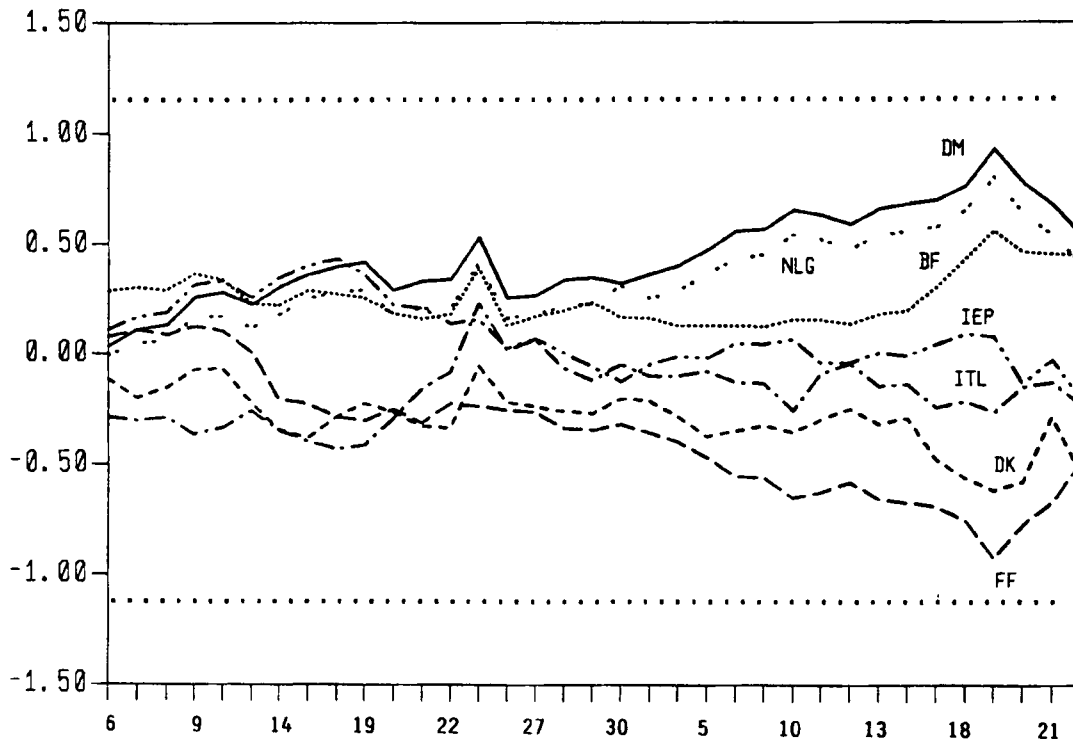
Factors of tension - The episode was associated with the differing monetary policy orientation of the ERM countries: on the 2nd of November the Bundesbank raised the lombard rate, followed by the Belgian and Dutch authorities; by contrast, French official rates were reduced in the same days and those of the other countries remained unchanged.

Summary - The Danish and French authorities exploited the scope for fluctuation within the band. The former did not employ the other two instruments; the latter made major interventions in the foreign exchange market, and only subsequently encouraged a limited rise in interest rates. The Bank of Italy allowed the lira to fall below the centre of the band, only partly countering the depreciation, relying mainly on intervention at first and then on a significant increase in market interest rates. The Irish authorities kept the punt close to the centre of the band, mainly through an increase in market interest rates, which preceded a rise in the intervention rate. The Belgian authorities avoided a divergence from the central parity with the DM with a timely increase in market interest rates.

Chronology - An initial phase of tensions occurred in November: between the 6th and the 19th the French franc depreciated by 0.6 per cent against the DM, with the krone and the lira falling by 0.4 per cent. The Danish authorities did not counter the krone's depreciation and the French made only modest interventions without modifying interest rates. Italian authorities initially resorted to large interventions, followed by an interest rate increase of more than 1 percentage point. In Ireland the central bank made modest interventions and at the same time facilitated a small increase in short-term interest rates.

A second phase of more acute tensions occurred in December. Between the 3rd and the 19th the French franc and the krone, the weakest currencies, depreciated against the DM by about 1 per cent; the franc's divergence from its central rate with the DM was close to 2 per cent. The Danish central bank did not make significant interventions and left interest rates nearly unchanged. The Bank of France mainly used interventions, while interest rates recorded only a modest increase, concentrated in the final days of the episode. The Belgian central bank reacted to the signs of weakness in the franc with the joint use of modest interventions and a more significant rise in interest rates (about 1 point). The Irish and Italian authorities only partially exploited the scope for fluctuation, maintaining their currencies close to the centre of the band. The Italian authorities made interventions in the foreign exchange market and raised short-term interest rates by about 0.6 points, distributing their action over the entire period. The Irish authorities made modest interventions in the first half of the month; in the second half market interest rates increased significantly (0.7 points), anticipating the 0.75 increase in the intervention rate on the 21st of December.

EPISODE 8: NOVEMBER-DECEMBER 1990 (6.11-19.12)



Episode 9: October-December 1991 (18.10-24.12)

Factors of tension - The tensions were mainly the result of differences in the orientation of monetary policies. In October the French and Danish authorities reduced their official rates. In the following two months expectations of a further rise in German rates emerged, which were confirmed by the Bundesbank's decisions on the 20th of December.

Summary - The period was characterized by persistent tension involving the French franc and the krone (the weakest currencies in the narrow band), the Italian lira and, to a lesser extent, the Irish punt. The Danish and French authorities initially exploited the scope for fluctuation within the band, without using the other two instruments (with the exception of modest interventions by the Bank of France). The French authorities then began to intervene intensively and eventually modified their monetary policy, increasing the intervention rate. The Danish authorities also halted the downward trend in interest rates during this second phase. The Italian authorities partly countered the depreciation of the lira with large interventions and a reversal of the interest rate trend, preceding the increase in the rate on fixed advances. The Irish authorities used a balanced combination of the three instruments: they allowed a slight depreciation of the punt, while nevertheless keeping it in the upper part of the band, made small interventions and facilitated a modest increase in interest rates. The krone and the Belgian franc reached the limit of their bilateral fluctuation band at the end of the period, forcing the two central banks to intervene at the margin. Tensions abated after the round of concerted official rate increases between the 20th and the 23rd of December.

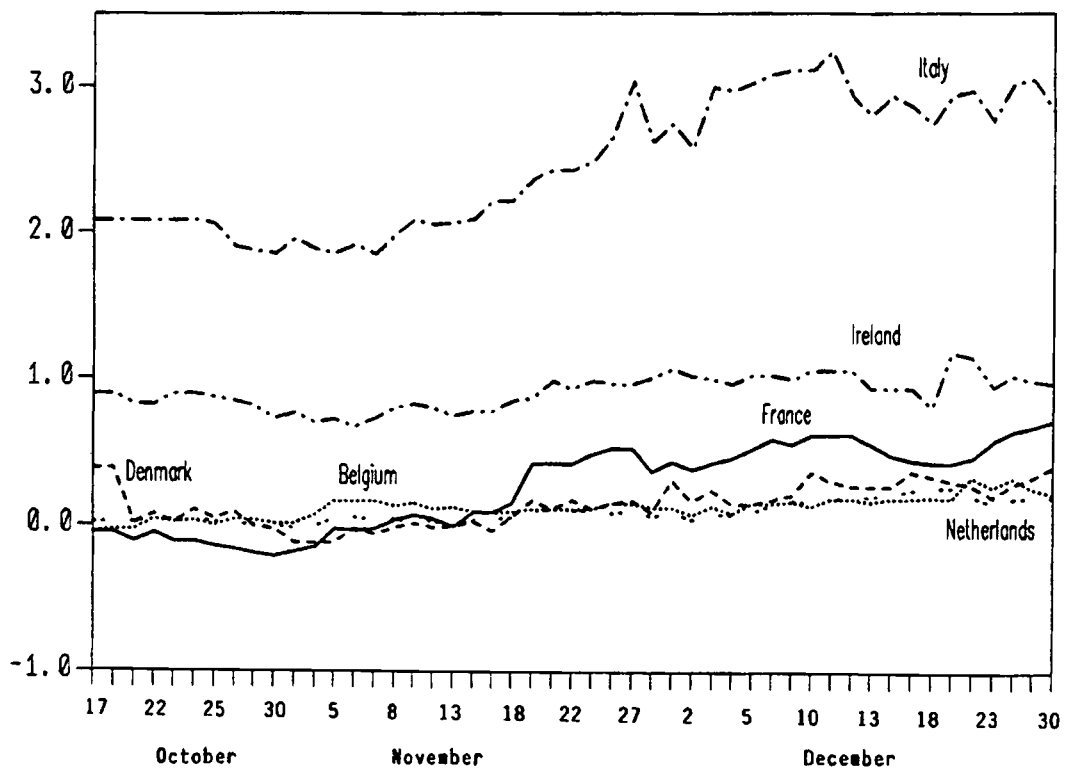
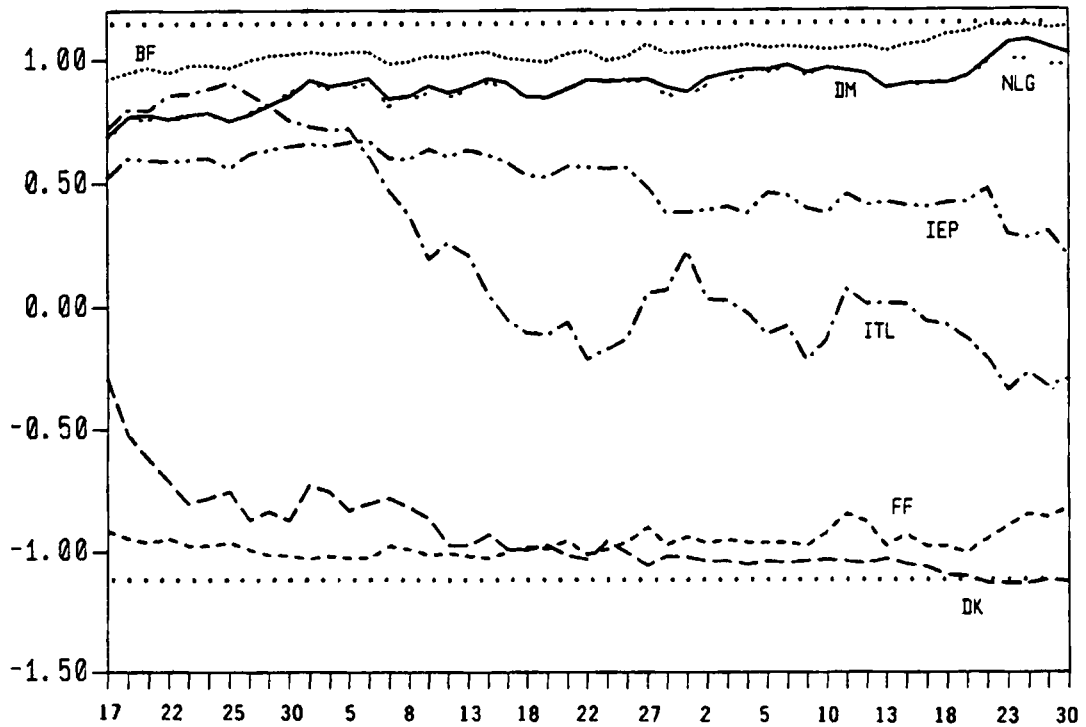
Chronology - The tensions first involved the krone and the French franc in the second half of October. The French franc, which began the period close to the lower limit, weakened further against the DM and the DM-linked currencies: its divergence from the central rate with the Belgian franc, the strongest currency, exceeded 2 percentage points. The French authorities made small interventions while allowing short-term interest rates to continue to decline; the differential with German rates turned negative on the 17th of October, reaching -0.2 points at the end of the month. The krone began to weaken on the 21st of October, when the Danish intervention rate was lowered by 0.5 points; its fall towards the lower limit was not countered by the authorities, which did not intervene in the foreign exchange market and allowed market interest rates to decline; the differential with German rates turned negative at the end of October.

In the face of persistent speculative pressures, the French and Danish authorities had to revise their orientation in November. In the first half of the month the French authorities reacted by increasing their exchange market interventions; on the 18th of November they raised the intervention rate by half a percentage point (after reducing it by 0.25 points only one month before), causing an identical

rise in short-term market rates. In Denmark the authorities reversed the downward trend in short-term interest rates, which rose by 0.3 points, and did not intervene in the foreign exchange market. The lira also weakened in the first twenty days of November, moving from 0.7 per cent above the centre of the band to 0.2 per cent below it. The Bank of Italy made increasingly large interventions, while at the same time halting the decline in interest rates in process since the beginning of September: rates rose by about 0.5 points, preceding an identical rise in the rate on fixed advances on the 26th of November. The Irish punt also weakened, although it remained in the upper part of the band; the Irish authorities made small interventions, while interest rates increased by about 0.3 points.

The tensions continued in December: the French franc remained close to the lower limit of the band, the krone reached the bilateral limit against the Belgian franc, and the lira dipped below the centre of the band. The French and Italian central banks made large interventions; short-term interest rates rose further, by about 0.4 points in both countries. In Ireland, monetary authorities made modest interventions, while market interest rate rose by about 0.2 points. Between the 20th and the 23rd of December the Danish and Belgian central banks made interventions at the margin, almost entirely financed through the VSTF. Danish interest rates increased by about 0.2 points. On the 20th of December the Bundesbank increased the discount and lombard rates, followed on the same day by the Belgian, Dutch, Danish and Irish authorities, which raised their official rates by the same amount. On the 23rd the French authorities raised the intervention rate and that on 5-10 day repos by 0.35 and 0.5 points respectively; the Italian authorities raised the discount rate by 0.5 points.

EPISODE 9: OCTOBER-DECEMBER 1991 (18.10-24.12)



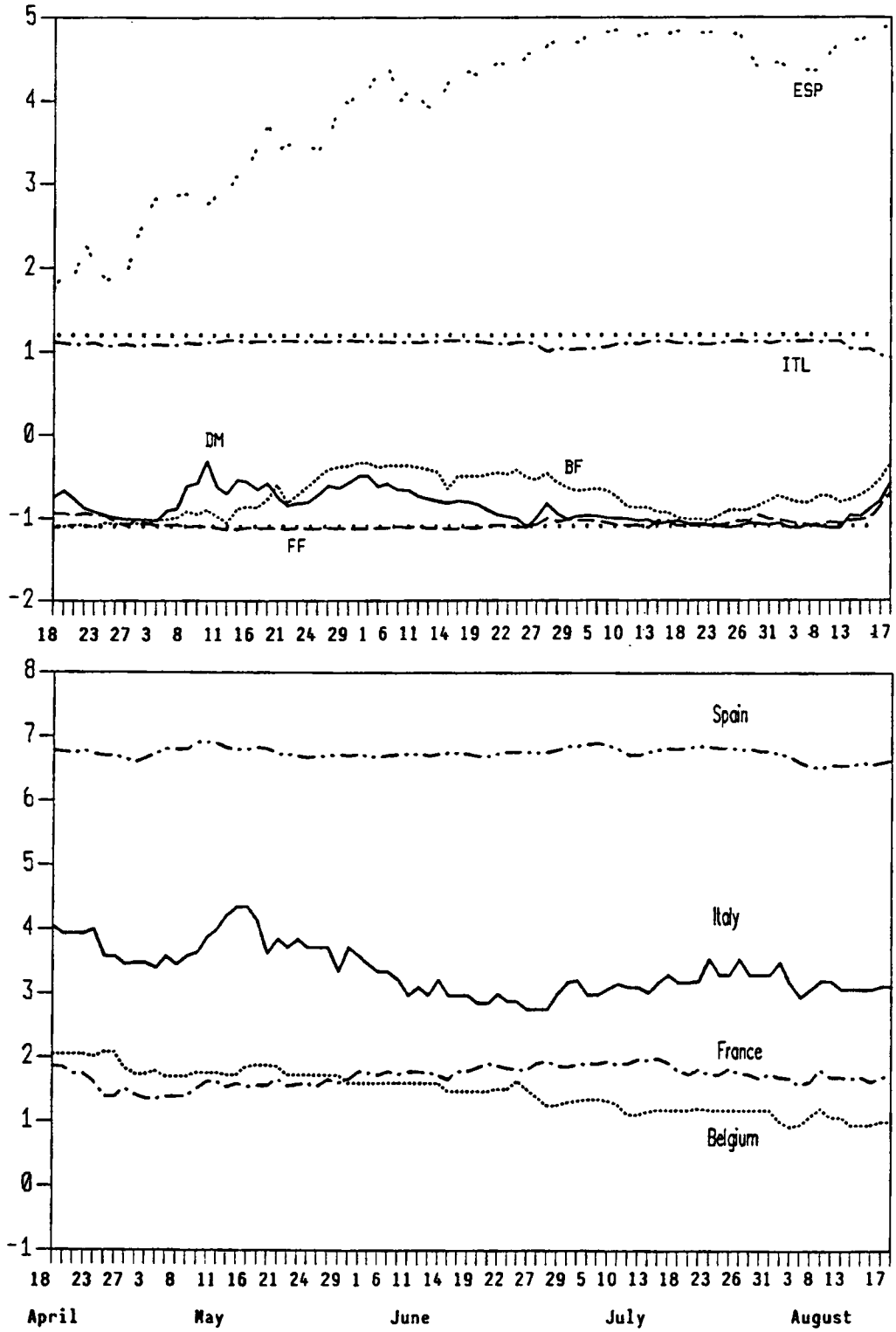
Episode 10: April-August 1990 (18.4-10.8)

Factors of tension - The first few months of 1990 were characterized by capital flows into high interest rate countries; this caused the lira to strengthen in the narrow band and the peseta in the wide one. The DM and the French franc weakened; the former reflected uncertainties about the consequences of the monetary unification process in Germany, especially as regards inflation, while the latter was due to the expansionary stance of French monetary policy (official rates were reduced twice in April, by a total of 0.5 percentage points; short-term market rates fell by about 1.3 points between the beginning of the year and the first part of April).

Summary¹⁸ - Between the end of April and the end of June, tensions between the German and French currencies on the one hand, and the lira on the other, were mainly eased mainly by the Bank of Italy, initially through large interventions and then through a significant decline in interest rates, triggered by the reduction in the discount rate in the second half of May. The French authorities initially allowed the franc to move to the lower limit of the band, subsequently intervening in the foreign exchange market; interest rates, which had continued to come down in the first days of tensions, rose only slightly. German interest rates rose slightly after the first weakening of the DM at the end of April. Between the beginning of July and mid-August, both the French franc and the DM reached their lower limits against the peseta in July and against the lira in August. The French and German authorities first exploited the scope for fluctuation in the band and then intervened extensively in the foreign exchange market, in conjunction with the Spanish and Italian authorities; interest rates decreased slightly in France and remained nearly unchanged in the other countries. Coordinated intervention, although not supported by variations in interest rates, caused the tensions to dissipate: pressure on the peseta ended after a round of interventions by the German and Spanish central banks at the end of July; those affecting the lira ended after a single coordinated intervention by the German, French and Italian central banks.

¹⁸ The chronology, which is not essential for the analysis of this and the following episode, has been eliminated.

EPISODE 10: APRIL-AUGUST 1990 (18.4-10.8)

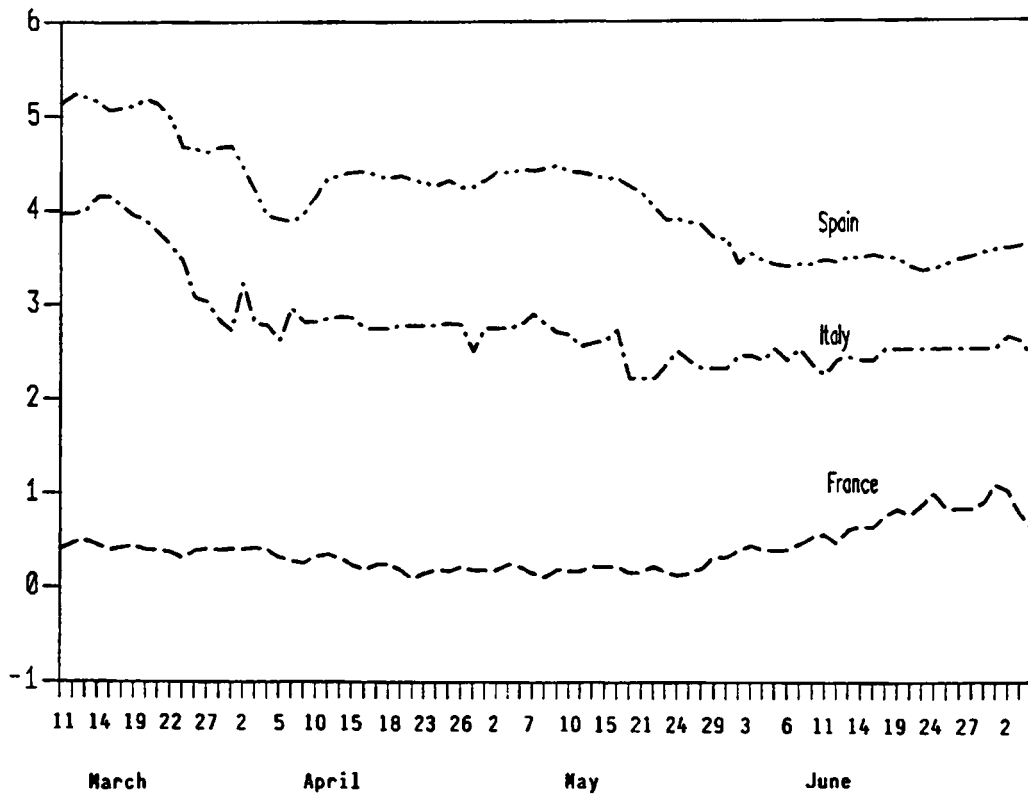
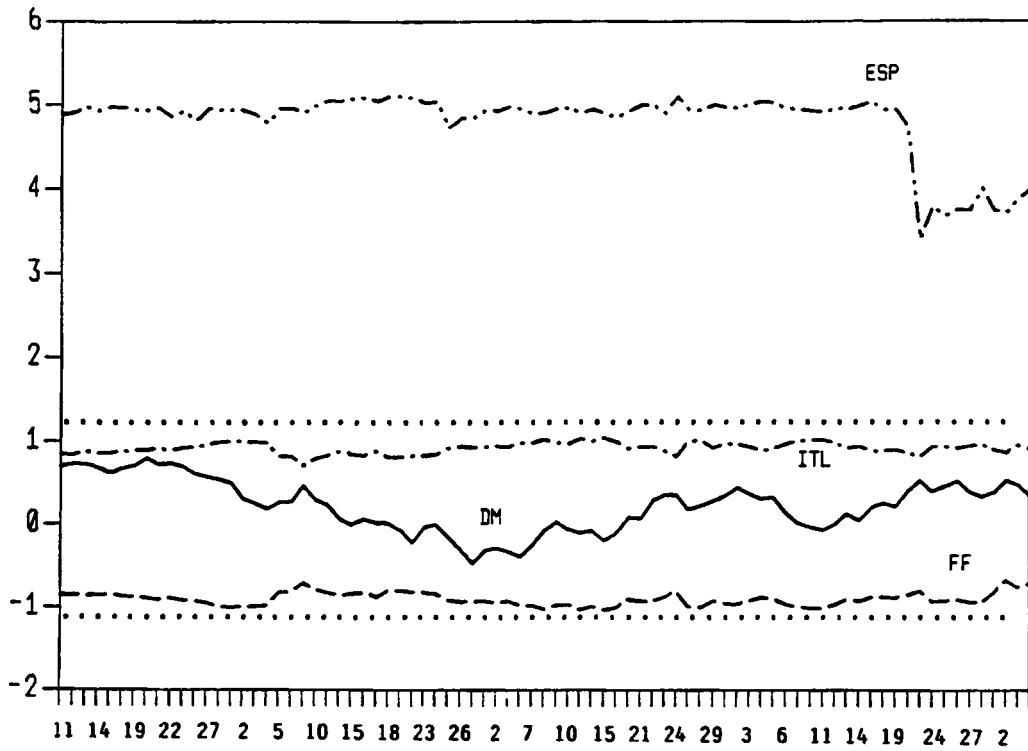


Episode 11: March-June 1991 (11.3-17.6)

Factors of tension - Capital flows towards the high interest rate countries continued in the first half of 1991 (see episode 10), again causing the lira and the peseta to strengthen.

Summary - During this episode the French authorities exploited widely the room for fluctuation within the band: the franc's bilateral divergence vis-à-vis the lira remained around 2 per cent for most of the period; that with the peseta at the limit. Once such scope had been exhausted, the Bank of France resorted to large interventions, selling pesetas at the margin; French interest rates rose only in the last part of the episode. Italian and Spanish authorities played a major role in maintaining orderly market conditions through interventions in the foreign exchange market similar in size to those of the Bank of France; they accompanied the interventions with significant interest rate reductions. The narrowing of the differential between rates in Spain and Italy and that in France helped to ease tensions; pressures finally ended when the rumours about the possible entry of the peseta into the narrow band determined the Spanish currency to weaken.

EPISODE 11: MARCH-JUNE 1991 (11.3-17.6)



A2. Phases of tension between June 1992 and August 1993

Phase A: June-July 1992 (2.6-24.7)

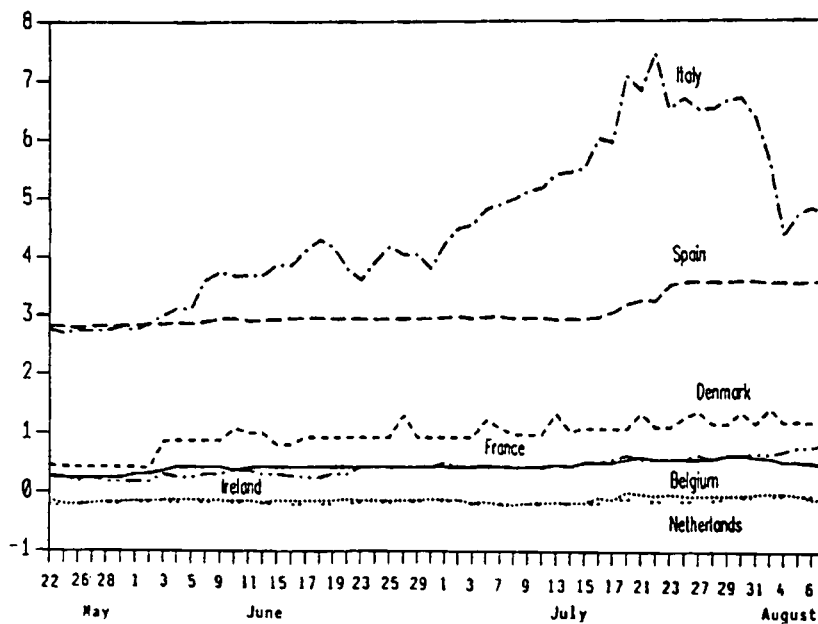
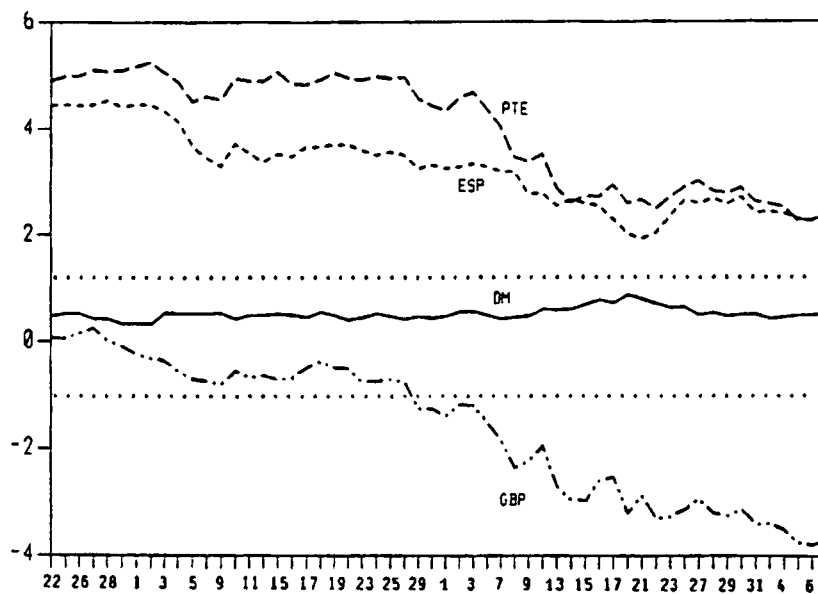
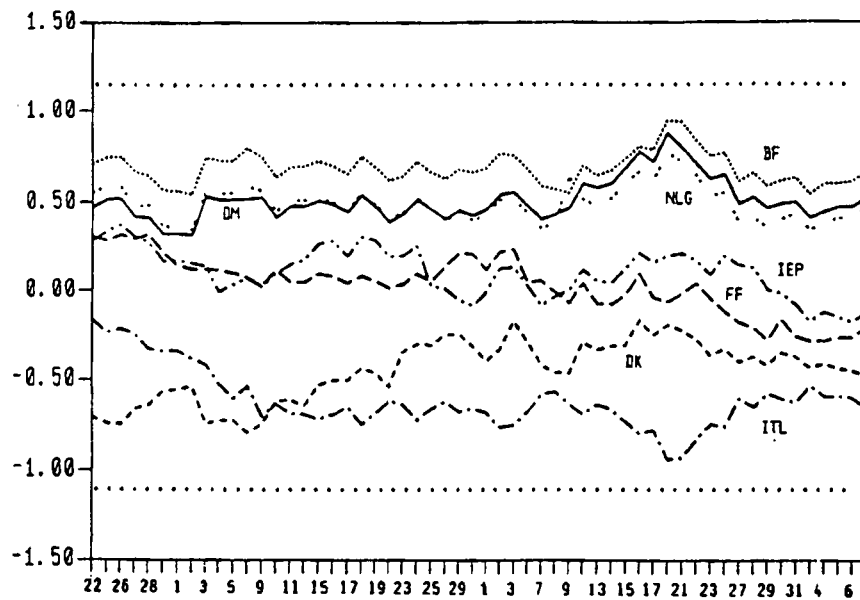
Factors of tension - Tensions began after the Danish referendum on the 2nd of June failed to approve the Maastricht Treaty. The consequent uncertainty surrounding the future of monetary union, which had exerted an important stabilizing influence on the EMS, together with delays in the convergence process in some member countries and the cyclical position of the German economy, encouraged expectations of a realignment. In July, developments in the ERM were also influenced by opposing changes in American and German official rates and the consequent weakening of the dollar.

Summary - The tensions mainly involved the lira. The Italian authorities allowed a significant depreciation against the DM, intervened intensively in the foreign exchange market and repeatedly increase official rates. The Danish authorities reacted to the pressures on the krone which emerged immediately after the referendum with a temporary depreciation of the currency and an increase in its main policy rate. Tensions also involved the British pound and the peseta in the wide band.

Chronology - The krone came under some pressure in the days immediately following the referendum; the Danish authorities reacted by increasing the main policy rate by 0.65 percentage points, at the same time allowing a slight fall in the exchange rate. The strong pressure on the lira induced the Italian authorities to use all three instruments in the first three weeks of June: they allowed a significant fall in the exchange rate with respect to the DM (0.6 per cent); intervened intensively in the foreign exchange market; raised the rate on fixed advances by half a point (on the 4th of June) and that on repos by nearly 2 points. Such measures contributed to temporarily stabilizing the lira in the lower part of the band.

Pressures on the lira sharpened again at the beginning of July, in conjunction with a weakening of the dollar. They were mainly countered by large interventions in the foreign exchange market and, on the 5th of July, by an increase of respectively 1 and 1.5 percentage points in the discount rate and that on fixed advances, temporarily easing the pressure. However, a new phase of tensions began a few days later: the Bank of Italy allowed the lira to depreciate further and made large interventions; the discount rate was raised on the 16th of July, in conjunction with an increase in German official rates. Tensions eased from the following week, allowing the Italian authorities to reduce the discount rate by half a point at the beginning of August.

PHASE A: JUNE-JULY 1992 (2.6-24.7)



Phase B: August-September 1992 (10.8-16.9)

Factors of tension - This new phase of severe tensions, which developed in conjunction with a further sharp depreciation of the dollar, largely reflected the uncertainty as to the outcome of the French referendum on European Union after the publication of polls suggesting the possibility of a negative result. The date of the referendum (20th of September) catalyzed market expectations, which took a realignment for granted if the Treaty were to be rejected, without excluding a readjustment, however, if it were approved.

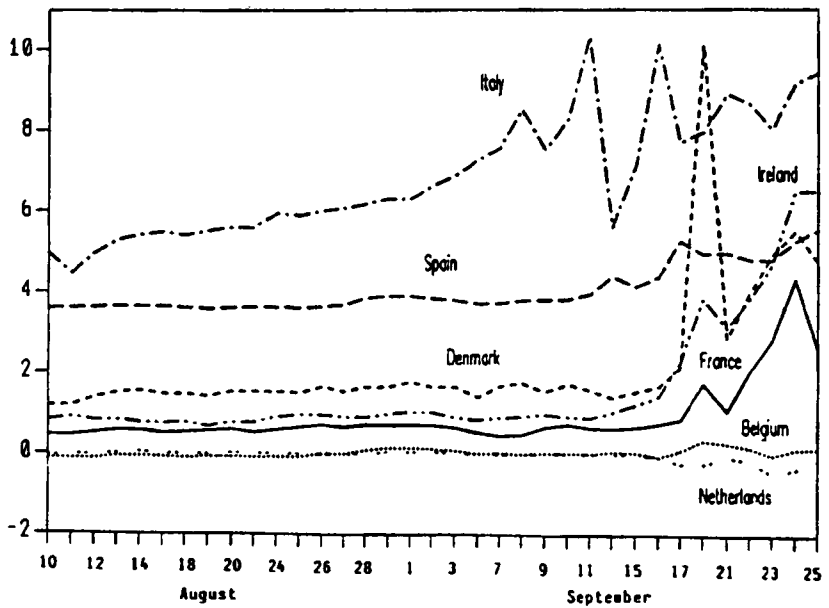
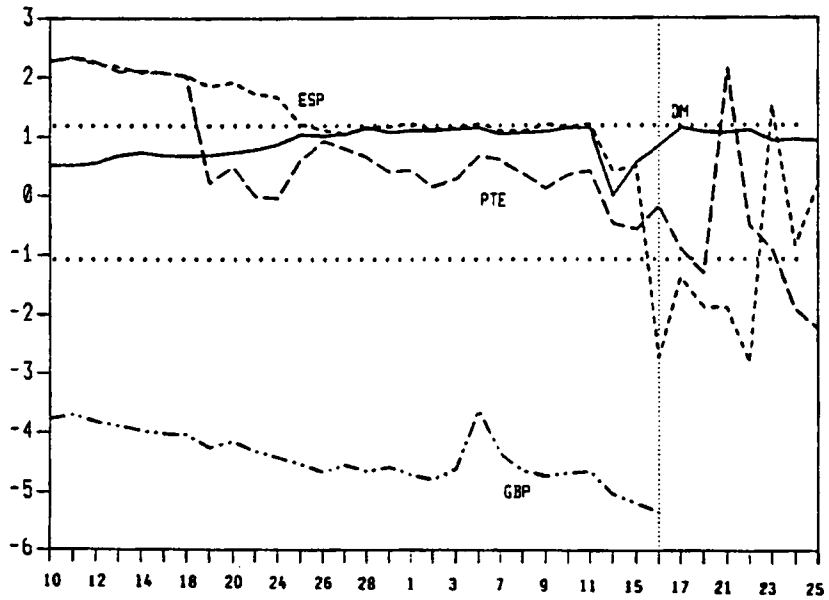
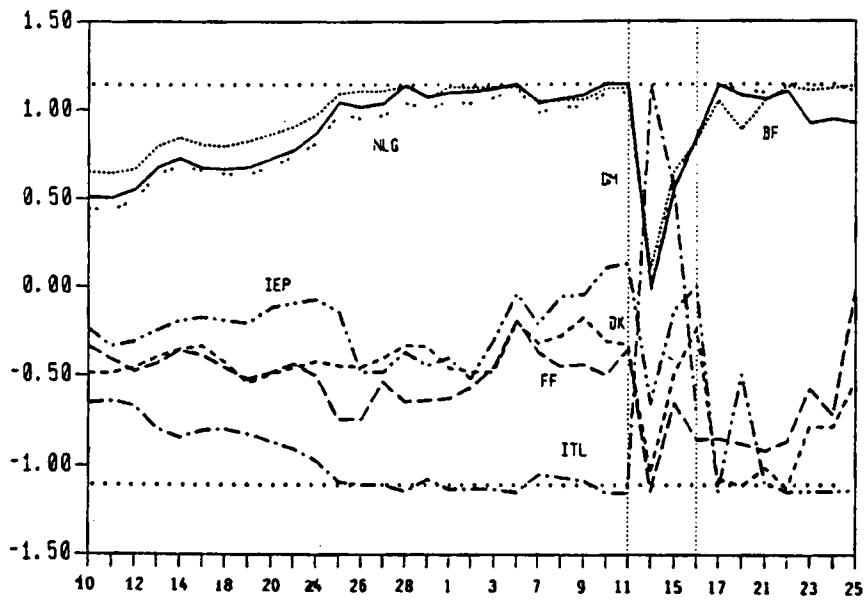
Summary - The lira suffered a strong speculative attack between the second half of August and the first half of September. The Italian authorities allowed a further fall in the exchange rate, which reached the lower limit for the first time since entry into the narrow band; the manoeuvre did not discourage speculation and the authorities intensified their use of the other two instruments, making large interventions in the foreign exchange market and inducing a further increase in market interest rates. The currencies in the wide band, especially the peseta and the British pound, also underwent strong pressures. On the 14th of September the central rate of the lira was devalued; on the 17th the pound's participation in the ERM was suspended, as were the Bank of Italy's interventions at the margin, and the central rate parity of the peseta was devalued by 5 per cent.

Chronology - From mid-August a strong speculative attack developed against the lira. Between the 13th and the 28th of August the Italian authorities allowed the lira to depreciate by 0.8 per cent against the DM, reaching the lower limit of the fluctuation band. They also made large interventions, while short-term interest rates, which had decreased by nearly 2 percentage points in the first half of August, rose by 1.6 points. Once the scope for fluctuation within the band was exhausted, the Italian authorities intensified the use of the other two instruments: in the first two weeks of September they made massive interventions at the margin; on the 4th of September they increased the discount rate by 1.75 points; in the following week market interest rates rose considerably, with the overnight rate peaking at 31 per cent and the 3-month interbank rate at 22 per cent, nearly 5 points higher than at the end of August. Between the end of August and the 11th of September the Bundesbank and the Bank of Belgium made interventions at the margin on behalf of the Bank of Italy through the VSTF.

A realignment of the EMS central parities was decided on the 14th of September, following the joint request of the Italian and German authorities: the lira was devalued by 3.5 per cent and the other ERM currencies revalued by the same percentage amount. The realignment was accompanied by a modest reduction in German official rates: the discount and the lombard rates were reduced by 0.5 and 0.25 points respectively. On the first working day after the realignment the market exchange rate of the lira fell by 3.5 per cent against the DM, staying in the upper part of the fluctuation band as

speculative pressures concentrated on the British pound and the peseta. Over the next two days, however, speculative pressures again spread to the Italian currency. The Spanish, Italian and British central banks made massive interventions in the foreign exchange market, without however succeeding in easing tensions. From the 17th of September British authorities decided to suspend the pound's participation in the ERM and Italy moved to suspend the compulsory interventions; the peseta was devalued by 5 per cent on the same day.

PHASE B: AUGUST-SEPTEMBER 1992 (10.8-16.9)



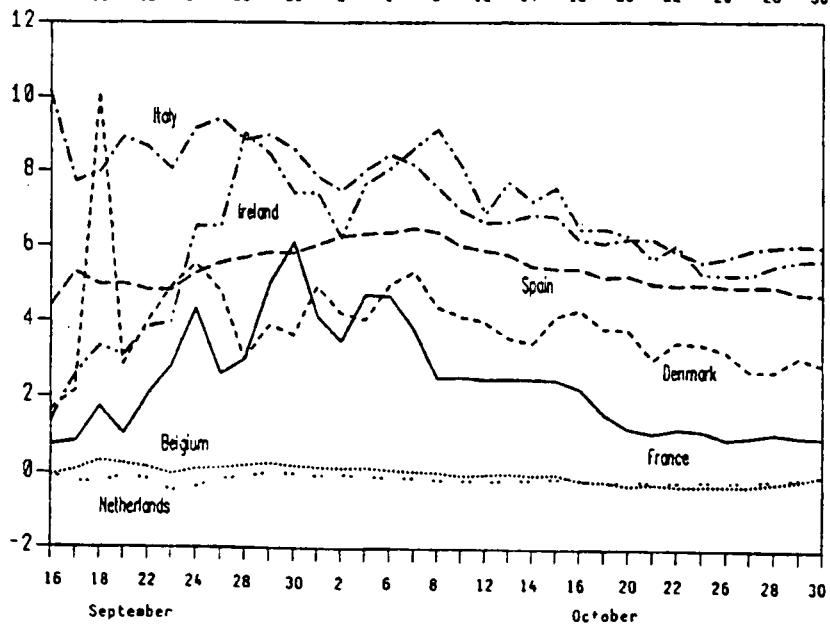
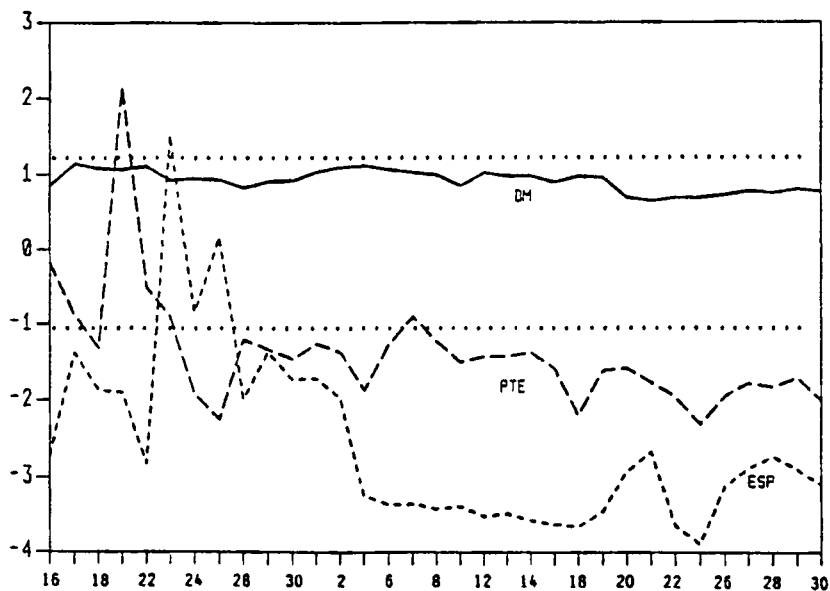
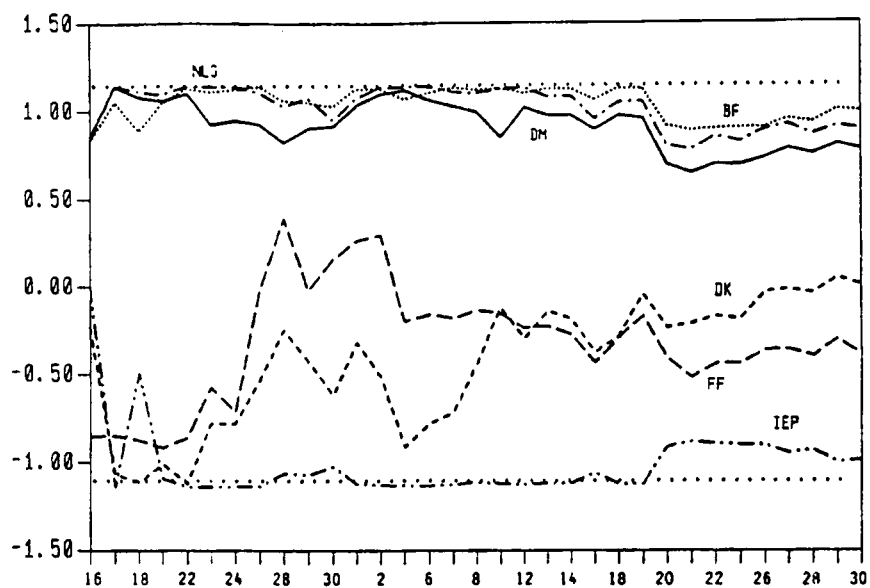
Phase C: September-October (17.9-16.10)

Factors of tension - The uncertainties surrounding the outcome of the French referendum on the 20th of September and, subsequently, the narrow margin in favour of European Union strengthened the doubts regarding the unification process and further weakened the EMS.

Summary - The French franc came under a strong speculative attack during the week immediately preceding the referendum and that following it. The French authorities initially reacted by allowing the exchange rate to fall close to the lower limit and by making large interventions in the foreign exchange market. After the referendum they increased the intervention rate; on the same day the French and German authorities issued a joint declaration supporting the existing central rate between the two currencies and made coordinated interventions in the foreign exchange market. The manoeuvre helped dissipate tensions. Strong speculative pressures also affected the punt and the peseta, forcing their authorities to make intensive use of the three instruments and to resort to capital controls.

Chronology - After the British pound's exit from the EMS and the suspension of marginal interventions by the Bank of Italy, tensions continued to affect the peseta and the escudo and spread to the French franc and the punt. The franc came under strong pressure in the week preceding the referendum and in the week after; the French authorities initially reacted with very large intramarginal interventions. On the 23rd of September, the Bank of France increased the intervention rate by 2.5 percentage points; at the same time the French and German authorities issued a joint declaration supporting the existing central rate and made concerted interventions in the foreign exchange market. The manoeuvre caused pressure on the franc to ease. Pressure on the Irish punt began following the British pound's exit from the EMS, partly reflecting worries about the worsening of the country's competitiveness. Between the second half of September and the beginning of October the Irish authorities made joint use of the three instruments: they allowed the exchange rate to fall to the lower limit of the band, effected interventions and facilitated a sharp increase in short-term interest rates (7.5 points); they also strengthened controls on short-term capital movements.

PHASE C: SEPTEMBER-OCTOBER 1992 (17.9-16.10)



Phase D: November-December (19.11-1.2)

Factors of tension - A new phase of tensions developed in November after the Swedish authorities' decision to abandon the unilateral peg to the ecu after making great efforts to resist speculative pressures, both with massive interventions in the foreign exchange market and with a very large increase in interest rates; the Norwegian authorities took the same step in December. Concern over the effects on competitiveness in Denmark and Ireland of the large depreciation of the Nordic currencies and the British pound encouraged speculation against their currencies.

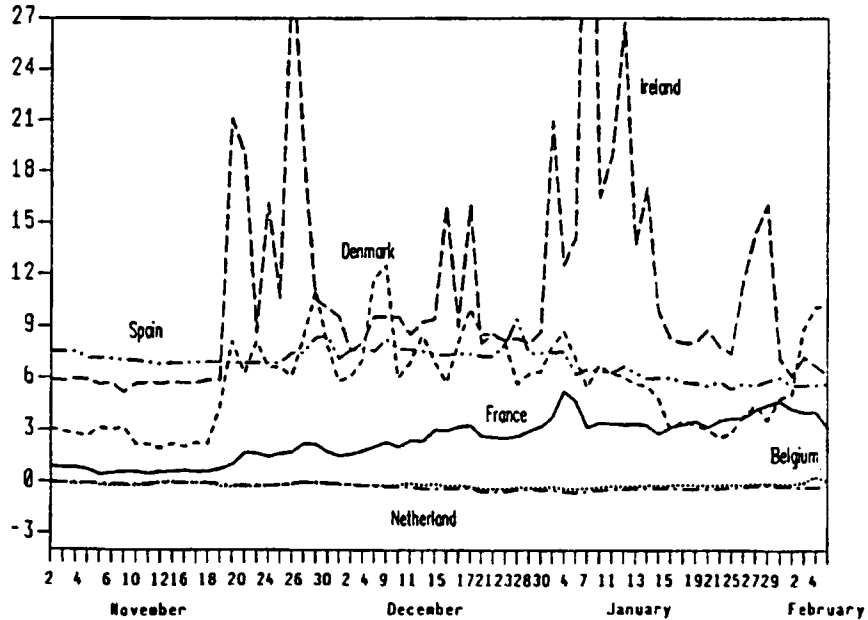
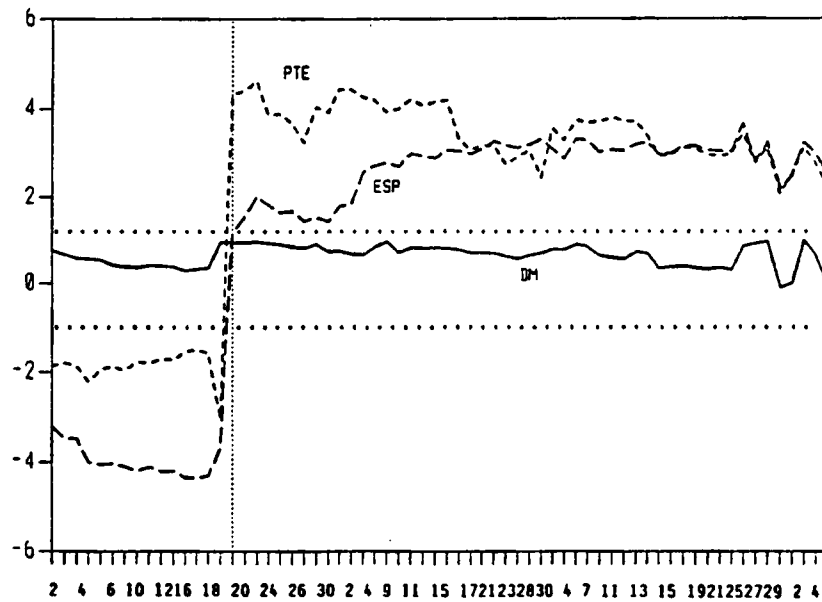
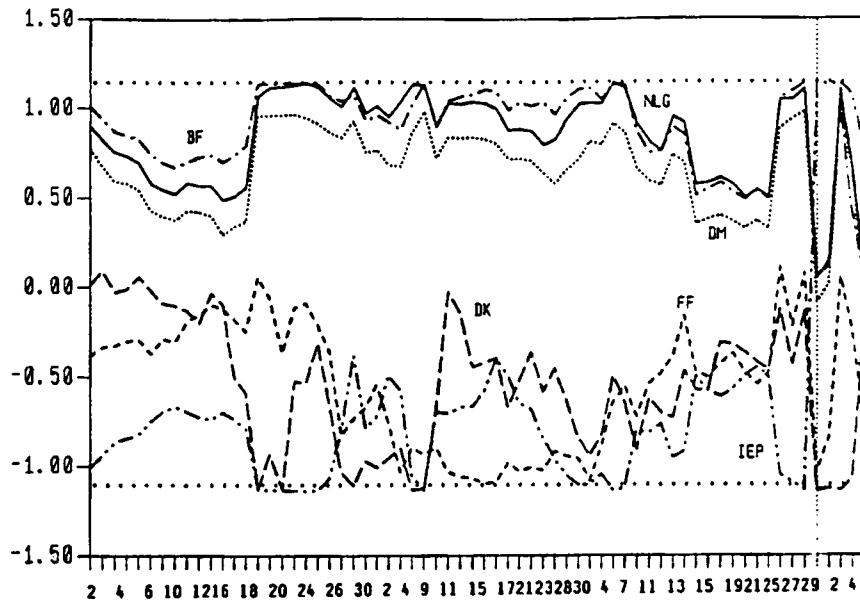
Summary - Tensions mainly affected the Irish punt, the Danish krone and the French franc in the narrow band and the two Iberian currencies in the wide band. The Danish authorities allowed the krone to reach the lower limit of the fluctuation band, subsequently facilitating an increase in short-term interest rates and making interventions in the foreign exchange market. The French authorities allowed the franc to depreciate, although without letting it reach the lower limit, while at the same time making very large intramarginal interventions in the foreign exchange market; they subsequently intensified their reliance on the monetary instrument. The Bank of Ireland initially allowed the punt to move to the lower limit of the band and immediately after made firm use of the policy rates; the Irish authorities' action was not sufficient to avoid the devaluation of the central rate on the 1st of February. The central rates of the peseta and the escudo were also realigned on the 22nd of November.

Chronology - In the days immediately following the decision by the Swedish authorities, tensions mainly involved the krone and the punt among the currencies in the narrow band and the two Iberian currencies in the wide band. On the 20th of November the krone and the punt fell to the lower limit of the band. On the same day the Danish authorities increased the intervention rate by more than 5 percentage points. Both central banks, together with the Belgian and Dutch authorities, made interventions at the limit. The Spanish and Portuguese authorities only partly countered the depreciation of their currencies with intramarginal interventions; on the 22nd of November the central rates of the peseta and the escudo were devalued by 6 per cent.

The pressure on the krone and the punt continued after the realignment and a new speculative attack was launched against the French franc. The French authorities initially allowed the exchange rate to decline by about 1 per cent against the DM, without letting it reach the lower limit; they made massive interventions in the foreign exchange market and induced an increase of about 1 point in short-term interest rates. After a temporary easing of tensions in the final part of the year, pressure re-emerged in the first week of 1993, inducing the French authorities to intensify the use of the monetary instrument: the 5-10 day repos were suspended and replaced by overnight operations, the rate on which was raised from 10 to 12 per cent. This measure was announced

simultaneously with a joint declaration by the French and German authorities confirming the consistency of the central rate of the two currencies and the respective economic fundamentals. The manoeuvre caused tensions to disappear. The krone remained at the lower limit of the band, requiring interventions at the margin by the Danish central bank, partly financed through the VSTF, and a further increase in short-term interest rates. Pressures on the krone eased following the general agreement reached in Edinburgh aimed at facilitating the ratification of the Maastricht Treaty. The punt was the object of repeated speculative attacks during the period; the Irish authorities allowed the exchange rate to fall to the lower limit of the band, made modest interventions and made very flexible use of the overnight repurchase rate, raising it to 100 per cent in two occasions. Such measures were not sufficient to avoid the devaluation of the punt's central rate by 10 per cent on the 1st of February.

PHASE D: NOVEMBER 1992-FEBRUARY 1993 (19.11-1.2)



Phase E: February-March (1.2-31.3)

Factors of tension - The success of speculation against the Irish punt encouraged new attacks on other currencies. The government crisis in Belgium and the uncertainty concerning the outcome of parliamentary elections in France contributed to the tensions.

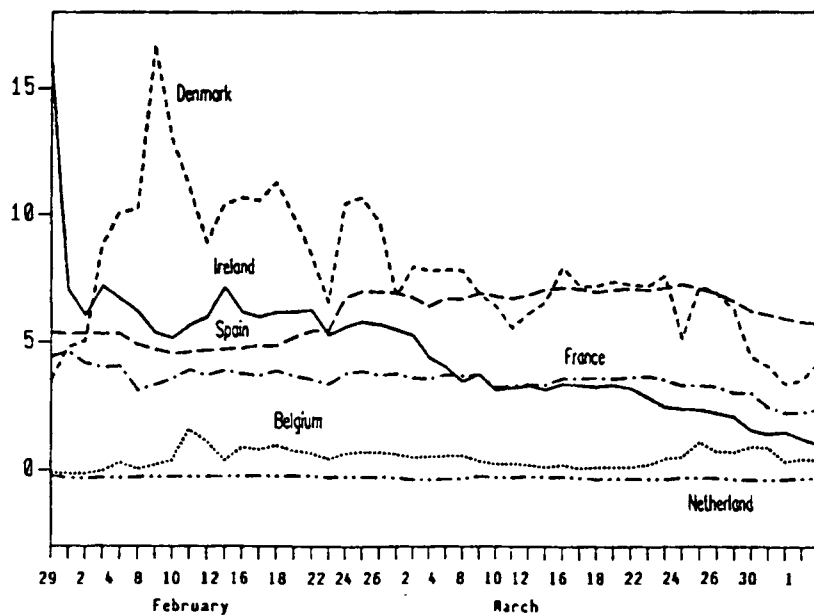
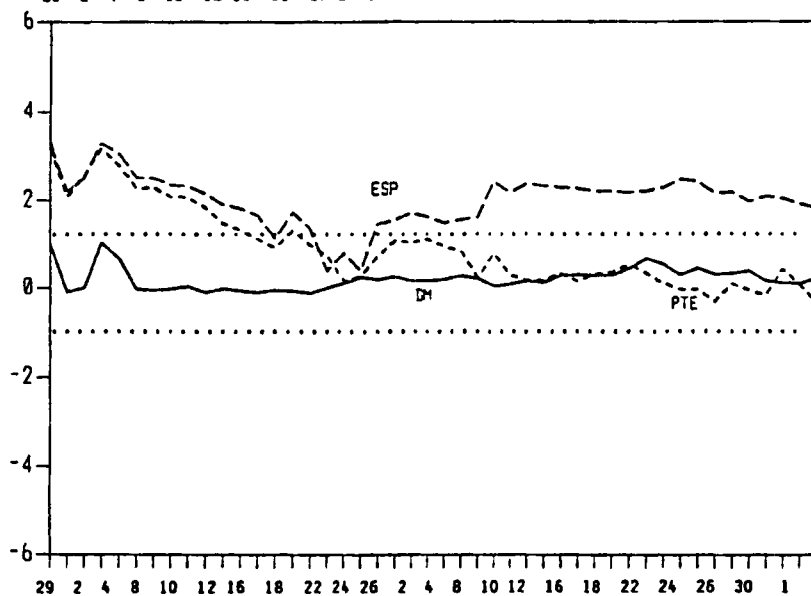
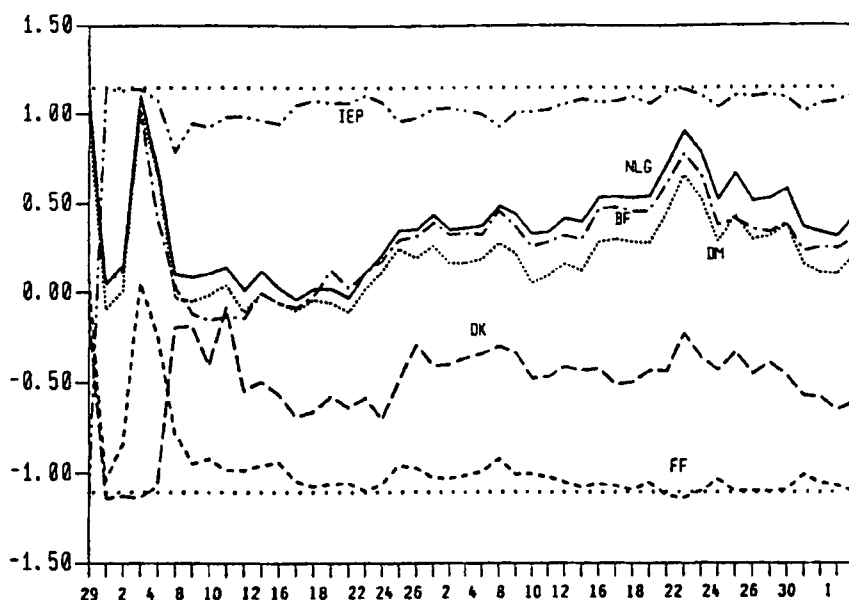
Summary - The tensions mainly involved the Danish krone and, for the first time since 1990, the Belgian franc. The usual strategy of the Danish authorities, which mainly relied on the use of the fluctuation band, was strengthened with significant increases in policy rates and intramarginal interventions coordinated with other EMS central banks. Belgian authorities mainly reacted with a prompt increase in official rates.

Chronology - The krone reached its lower limit against the punt, which had just been devalued, on the 1st of February and against the DM, the guilder and the Belgian franc on the 3rd of February. The Bank of Denmark intervened at the margin together with the other four central banks and raised its rate on repurchase operations by 1.5 percentage points. The next day these banks, together with the French and the Spanish central banks, participated in a new round of coordinated intramarginal interventions; the Danish discount rate was increased by 2 points. These measures eased the tensions, which finally ended after the announcement of a reduction of German official rates on the same day.

In the second week of February, the Belgian franc were also subjected to speculative pressures. The Belgian authorities immediately raised the rate on end-of-day advances by half a point, made small interventions in the foreign exchange market and publicly confirmed their commitment to anchoring the currency to the DM; short-term market interest rates rose by 1.6 points in three days. The manoeuvre succeeded and the following week the Belgian franc was again above the central rate with the DM. At the end of March, however, a new phase of tensions occurred on the occasion of the government's resignation on 23rd of March owing to disagreement within the majority on the public finance programme. The central bank immediately increased the three main policy rates by amounts ranging between 0.5 and 2.75 percentage points. In the days that followed the Belgian currency recovered, helped by the agreement on the public finance programme reached on the 31st of March.

The French franc came under renewed pressure in the second ten days of March, on the eve of the general elections scheduled for the 21st of March. French authorities allowed the exchange rate to fall to the lower limit against the punt, while at the same time intervening in the foreign exchange market; official rates remained unchanged and short-term market rates recorded only a slight increase. Tensions abated after the elections, partly owing to reassurances of the new government coalition concerning its commitment to maintaining exchange rate stability.

PHASE E: FEBRUARY-MARCH 1993 (1.2-31.3)



Phase F: July-August 1993 (8.7-2.8)

Factors of tension - Tensions developed after the publication of pessimistic forecasts for the European economy, especially France, which induced markets to reconsider the conflict between the domestic needs of monetary policy and those related to defending the exchange rate.

Summary - After a period of stability between April and the beginning of summer, severe tensions again developed within the narrow band, involving the French and Belgian francs and the Danish krone.¹⁹ The French authorities adopted a strategy similar to that followed on previous occasions: they initially allowed the exchange rate to move within the fluctuation band and made considerable interventions, partly coordinated with the Bundesbank; only subsequently did they intensify their use of the monetary instrument. Once they had exhausted the scope for depreciation within the band, the Danish authorities intervened at the margin and raised the policy rates; as had occurred in February the krone was supported by coordinated interventions by other ERM central banks. Belgian authorities principally reacted by increasing official rates.

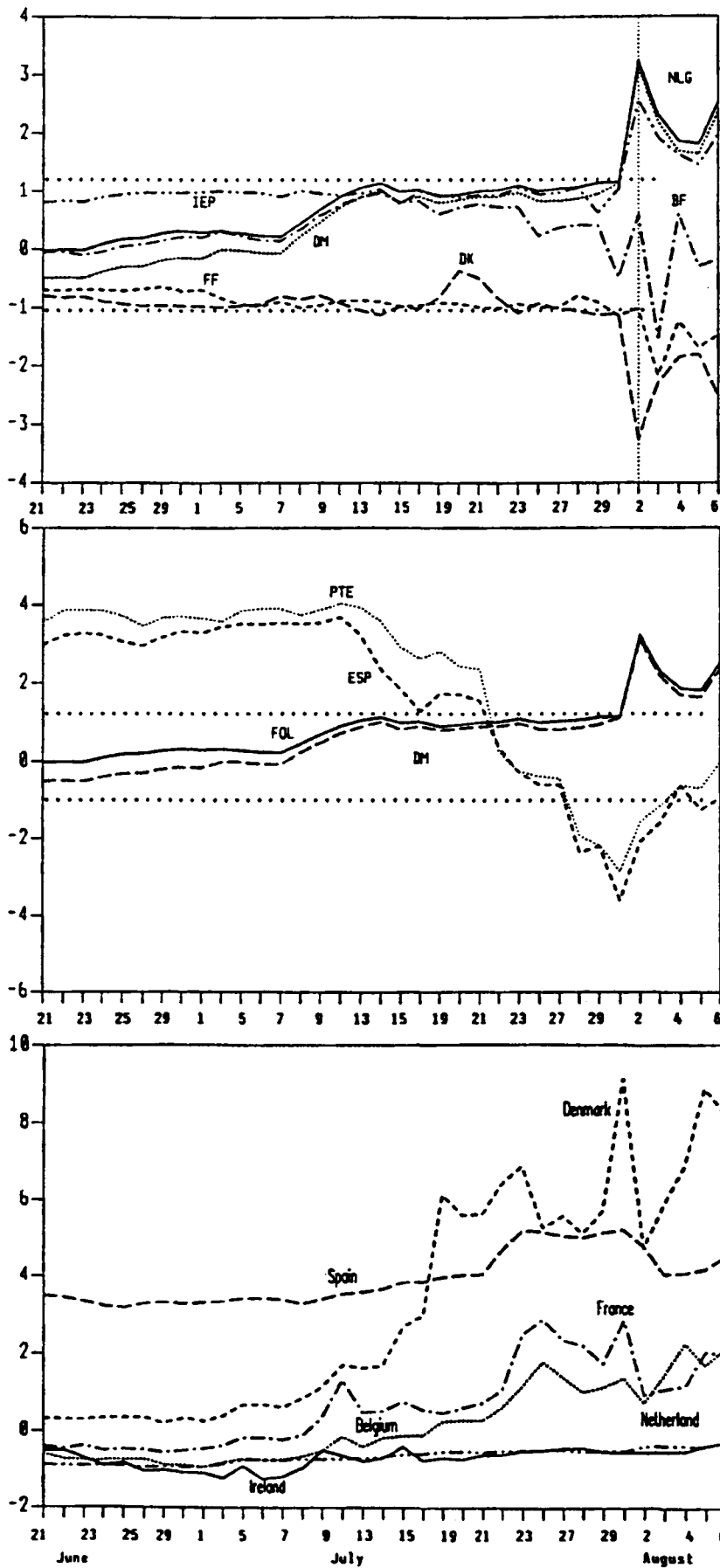
Chronology - Between the end of June and the first part of July the French authorities allowed the franc to depreciate to near the lower limit against the DM, although without reaching it; in the same period the Bank of France made considerable interventions, partly coordinated with the Bundesbank, and the authorities of the two countries issued a joint statement in support of the existing central rate; the Bank of France did not raise official rates, but facilitated an increase in money market rates, which brought the differential with German rates back to positive values. In the face of intensifying pressures, the French authorities suspended 5-10 day repurchase operations on the 23rd of July and replaced them with overnight operations, the rate on which was raised from 7.75 to 10 per cent; at the same time, the French and the German authorities issued another joint declaration in support of the existing parity. This strategy, which had been successful on previous occasions, lessened the tensions only temporarily. After the Bundesbank's decision not to lower the discount rate on the 29th of July, a reduction which was considered decisive for the fate of the EMS, speculative movements reached exceptional size and became overwhelming, notwithstanding the Bank of France's attempt to resist with huge interventions in the foreign exchange market. On the 2nd of August, it was finally decided to widen the fluctuation limits to ± 15 per cent for all ERM countries.

The tensions also involved the Danish krone, the Belgian franc, the peseta and the escudo. The krone began depreciating at the end of June and reached its lower limit against the guilder on the 14th of July, forcing the Danish and the Dutch

¹⁹ A new phase of tension had previously involved the peseta between the second half of April and the first part of May; on the 14th of May the central parities of the Spanish and Portuguese currencies had been devalued by 8 and 6.5 per cent respectively.

central banks to intervene at the margin. The following day the Bank of Denmark increased its rate on repurchase operations by more than two points. On the 16th, a round of coordinated interventions in support of the krone included the participation of the other ERM central banks; on the same day the discount rate and the key current account lending rate were raised by 2 percentage points. Interbank rates rose rapidly: the 3-month rate rose by about 5 points, to 14 per cents and the overnight rate reached peaks of around 40 per cent. From mid-July tensions also affected the Belgian franc, becoming more acute in the final days of the month. The Bank of Belgium reacted by repeatedly increasing the policy rates, raising that on advances by a total of 4.5 points and intervening in the foreign exchange market; the Dutch central bank made intramarginal interventions in support of the Belgian currency.

PHASE F: JULY-AUGUST (8.7-2.8)



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