

DOCUMENT OF INTERNATIONAL MONETARY FUND AND NOT FOR PUBLIC USE

MASTER FILES

ROOM C-120

01

SM/83/16

January 24, 1983

To: Members of the Executive Board

From: The Secretary

Subject: The European Monetary System - The Experience, 1979-82

There is attached for the information of Executive Directors a paper reviewing developments in the European Monetary System from 1979 through 1982.

Att: (1)

Other Distribution:
Department Heads

INTERNATIONAL MONETARY FUND

The European Monetary System: The Experience, 1979-82

Prepared by the European Department 1/

(In Consultation with the Exchange and Trade Relations Department,
the Legal Department, the Research Department, the Treasurer's
Department, and the Office in Europe)

Approved by L. A. Whittome

January 19, 1983

| | <u>Page</u> |
|--|-------------|
| I. Introduction and Background | 1 |
| 1. History and objectives | 1 |
| 2. The main features of the EMS | 3 |
| II. The Performance of the System | 5 |
| 1. General | 5 |
| 2. Exchange rate developments | 7 |
| 3. Variability of exchange rates | 9 |
| 4. The problem of convergence | 12 |
| a. The EMS concept of convergence | 12 |
| b. Price developments | 13 |
| c. Monetary developments | 14 |
| 5. Factors influencing the performance of the system | 15 |
| III. The Evolution of the System | 16 |
| 1. Operational aspects | 16 |
| a. Exchange rate and intervention mechanism | 17 |
| b. Divergence indicator | 19 |
| c. Settlement of intervention debts | 20 |
| d. Role of the ECU | 21 |
| e. Credit facilities | 22 |
| 2. Proposals for institutional changes | 23 |

1/ This paper has been prepared by H. Ungerer, P. Nyberg, and O. J. Evans, with the cooperation of M. T. Hadjimichael, D. Burton (now ASD), and T. Juncker (summer intern).

| | <u>Page</u> |
|---|-------------|
| IV. The EMS and the IMF | 25 |
| 1. The EMS and the functions of the Fund | 25 |
| a. Surveillance over exchange rate policies | 25 |
| b. Conditionality in credit operations | 26 |
| c. Creation of international liquidity | 28 |
| 2. Information about the EMS | 29 |
| Appendix A: Tables 1-29 | 32-61 |
| Appendix B: Bibliography | 62-66 |

I. Introduction and Background

This paper is intended for the information of Executive Directors and is concerned with developments in the European Monetary System (EMS) since its start in March 1979. Chapter I provides a summary of events leading up to the establishment of the EMS and a survey of its main features. Chapter II assesses the performance of the system by describing major exchange rate developments and examining the extent to which exchange rate stability and convergence of economic developments within the EMS have been achieved. Chapter III discusses the evolution of the system with special attention to various operational aspects and a summary description of proposals for the institutional development of the system. Chapter IV considers the relationship between the EMS and the IMF. The appendices contain statistical material and a bibliography of relevant documents and literature.

Executive Directors discussed the EMS on December 21, 1978 and March 16, 1979. They have been kept informed about developments in the EMS by several general documents (see bibliography), the distribution of material of special interest from national or EC sources, and by the discussion of relevant EMS matters in Article IV consultation reports, World Economic Outlook papers, Annual Reports, and reports on exchange arrangements and restrictions. Executive Directors have also been promptly notified about changes in central rates of EMS currencies.

1. History and objectives

At its meeting in Bremen on July 6 and 7, 1978, the European Council, composed of the Heads of State and Government of the member countries of the European Community (EC), agreed that closer monetary cooperation between EC countries should be promoted through the creation of the European Monetary System; an outline for the system was made public as an annex to the conclusions of the Presidency of that meeting. The main features of the EMS were set out in a Resolution adopted by the European Council at its meeting in Brussels on December 4 and 5, 1978. ^{1/} The relevant legal texts, in particular the Agreement between the central banks of the EC on the operating procedures for the EMS were subsequently adopted. The system went into operation as of March 13, 1979, after difficulties relating to monetary aspects of the common agricultural policy of the European Community had been resolved. These difficulties had delayed the entry into force of the EMS from the originally envisaged date of January 1, 1979. At the same time, the European common margins arrangements (the "snake") ceased to exist. ^{2/} All EC

^{1/} Relevant documents concerning the EMS have been published by the Commission of the European Communities in: European Economy, No. 3, July 1979. For the Resolution see also EBD/78/271 (12/6/78); and IMF Survey, December 13, 1978.

^{2/} For a summary history of the "snake," see SM/79/49, (2/14/79).

countries but the United Kingdom decided to participate in all aspects of the EMS, in particular in the operational heart of the system, the exchange rate mechanism. Italy and Ireland, due to their particular economic circumstances, at first had hesitated to join. However, for economic as well as political reasons, both countries decided in favor of participation. In the case of Italy, the decision to participate was facilitated by the flexibility provided by the possibility offered to countries with floating currencies (i.e., non-participants in the "snake") to opt for temporarily wider fluctuation margins (of up to 6 instead of 2 1/4 per cent). Ireland joined despite the fact that the United Kingdom decided not to participate in the exchange rate mechanism. Both Italy and Ireland also benefited from special financial measures for the less prosperous member countries fully participating in the EMS. Greece, which became a member of the European Community as of January 1, 1981, is at present not a member of the EMS.

The United Kingdom accepted general membership in the EMS but decided for the time being not to participate in the exchange rate mechanism; consequently, the Bank of England is not a partner in the very short-term financing facility serving to finance obligatory intervention at the margins in participating currencies. The pound sterling is included in the basket which forms the European Currency Unit (ECU), while the Greek drachma is not; the Treaty of Accession to the EC provides for the inclusion of the drachma at the latest by December 31, 1985, or earlier in the case of a revision of the ECU basket.

Because the pound sterling does not participate in the exchange rate mechanism, the link between the British and Irish pounds was broken at the end of March 1979. This forced Ireland to take certain measures in the foreign exchange and monetary field, but may have hastened a development which would inevitably have happened sooner or later. The change encouraged Ireland to orient its economy more toward member countries in the EC other than the United Kingdom.

The predecessor of the EMS, the European common margins arrangements (the "snake"), was originally part of a broad effort of the EC countries, initiated in 1969, to create an Economic and Monetary Union by 1980. It aimed at the establishment of an autonomous exchange rate system among EC countries and at the gradual abolition of the fluctuation margins between EC currencies. However, adverse events such as the breakdown of the world-wide system of stable exchange rates in 1973, and the first round of oil price increases in 1973/74, consequences of which differed from country to country, made it difficult for the "snake" to succeed in its original aims. In the end, it was not much more than a common exchange rate mechanism for a small group of EC countries (Belgium, Denmark, Germany, Luxembourg, the Netherlands); over the years the other EC countries (the United Kingdom, Italy, France) as well as the two associated countries, Sweden and Norway, had

decided to leave the arrangement. While in some aspects, such as the exchange rate mechanism or the financing of intervention, the EMS is broadly similar to the "snake," it differs in other aspects, both technical and political. Above all, the EMS has a political dimension which makes adherence to the system not just a question of economic expediency. Features such as the ECU, the procedures to decide in common about exchange rate changes, and the general emphasis on the convergence of economic policies and developments underline the Community aspect of the EMS and the mutual dependence and responsibility of its members.

The main objective of the EMS has been clearly stated by the European Council as a "zone of monetary stability in Europe" (para. 1.1 of the Resolution) and in this quotation from the conclusions of the Presidency of the December 1978 meeting: "The purpose of the European Monetary System is to establish a greater measure of monetary stability in the Community. It should be seen as a fundamental component of a more comprehensive strategy aimed at lasting growth with stability, a progressive return to full employment, the harmonization of living standards and the lessening of regional disparities in the Community. The European Monetary System will facilitate the convergence of economic development and give fresh impetus to the process of European union. The Council expects the European Monetary System to have a stabilizing effect on international economic and monetary relations."

2. The main features of the EMS 1/

At the heart of the EMS is a system of fixed but adjustable exchange rates. Each currency has a central rate expressed in terms of the ECU (European Currency Unit). These central rates determine a grid of bilateral central rates, around which fluctuation margins of ± 2.25 per cent (6 per cent for the Italian lira) have been established. At these margins, intervention by the participating central banks is obligatory and unlimited in amount. Intervention is in principle to be effected in participating currencies; 2/ intervention in other currencies (i.e., chiefly in U.S. dollars) is allowed and has been undertaken on a substantial scale.

The grid of bilateral central rates and intervention limits is supplemented by the "divergence indicator," which shows the movement of the exchange rate of each EMS currency against the (weighted) average movement of the other EMS currencies. The criterion used is the divergence of its actual daily rate, expressed in ECUs, from its ECU central

1/ For details, see SM/79/55,(2/16/79); and IMF Survey, March 19, 1979, Supplement. Additional literature is listed in the bibliography.

2/ Throughout the paper, the terms "participating currencies" or "EMS currencies" refer to the currencies of the central banks participating in the exchange rate mechanism of the EMS, thus excluding the pound sterling.

rate. If a currency crosses a "threshold of divergence," set at 75 per cent of the maximum divergence spread, this leads to a presumption that the authorities concerned will correct the situation by adequate measures, such as diversified intervention, measures of domestic monetary policy, changes in central rates, or other measures of economic policy.

The ECU, which consists of a basket of fixed amounts of the nine currencies of all Community members, except for the time being the currency of Greece, plays a central role in the EMS. It serves as the numeraire for the exchange rate mechanism, as the denominator for operations in both the intervention and the credit mechanism, as a reference unit for the divergence indicator, and as a means of settlement and as a reserve asset of EMS central banks.

For the financing of interventions in EMS currencies, there are mutual credit lines between the participating central banks (the "very short-term financing facility," VSTF). Claims and debts arising from such interventions are settled according to certain rules governing, among other things, the use of ECUs for such purposes.

The "short-term monetary support" (STMS) and the "medium-term financial assistance" (MTFA) that had been established in 1970 and 1971, respectively, were substantially enlarged at the time of establishment of the EMS. They now provide ECU 25 billion ^{1/} of effectively available credit, compared with ECU 10 billion before. The two facilities are available to all members of the EC, including the United Kingdom and Greece. They are designed for mutual financial assistance in cases of balance of payments difficulties. They have not been used since the EMS entered into force.

At the start of the EMS, the central banks participating in the exchange rate mechanism of the EMS received an initial supply of ECUs against "contributions" of 20 per cent of both their gold holdings and gross dollar reserves (at market-related valuations) to the European Monetary Cooperation Fund (EMCF). ^{2/} These transactions took the form of revolving three-month swaps, which allow the necessary adjustments to keep contributions at the level of 20 per cent each of gold and dollar reserves, and to take account of any price or rate changes that may have occurred since the previous adjustment. It was agreed that the EMCF would leave the administration of the reserves transferred to it by the swaps to the contributing central banks. The EMCF was established in April 1973 and has served as the administrator for transactions under the "snake" and the EMS as well as the VSTF and the STMS.

Under the provisions governing the EMS, adjustments of central rates are "subject to mutual agreement by a common procedure which will comprise all countries participating in the exchange rate mechanism and the Commission." ^{3/}

^{1/} ECU 1 = US\$0.97 on December 30, 1982.

^{2/} The United Kingdom, although not a participant in the exchange rate mechanism, in July 1979 decided to voluntarily contribute 20 per cent of its gold and dollar reserves to the EMCF against ECUs.

^{3/} European Council Resolution of December 5, 1978, para. A.3.2.

II. The Performance of the System

1. General

At the start of the EMS, contrasting expectations and fears were raised with regard to the consequences of a strict adherence to a system of fixed (though adjustable) exchange rates on economic developments and policies of participating countries. There was concern that the constraints of a system with fixed exchange rates would exert a powerful deflationary influence on economic developments, and that in order to ward off excessive loss of reserves, the countries with higher inflation rates and a less favorable economic climate increasingly would be forced to turn to overly restrictive policies, with negative consequences for growth and employment. On the other hand, many critics of the system feared that fixed exchange rates and the consequent obligation to intervene would deprive the more stability-conscious countries of the independence necessary to control domestic monetary expansion so as to contain inflationary price and cost developments. It was argued that the existence of large credit facilities would encourage their use, and that the financing would have to be provided by the countries with stronger currencies, thus allowing the deficit countries to avoid domestic adjustment measures. Such critics feared that the EMS would become a machinery for the creation of more liquidity and inflation and that, even at best, it would force the stability-conscious countries to settle for a higher average rate of inflation. A third line of thinking was that the system would not be able to hold together for very long. It was unreasonable to expect that countries with highly divergent economic developments would be able to align their policies to the degree necessary to keep a system of fixed exchange rates functioning. As a consequence, speculative capital movements would disrupt foreign exchange markets and force upon the authorities sudden and substantial exchange rate changes with adverse consequences on the economies of participating countries. Hence, the EMS would be faced with problems similar to those which occurred in the final phase of the Bretton Woods system. The only alternative to irregular, sudden and rather large exchange rate adjustments would be to move to a system with small but frequent exchange rate adjustments--similar to a crawling peg--which would regularly bring exchange rates in line with underlying economic developments. But neither alternative was compatible with one of the basic aims of the EMS, namely, the establishment of a zone of exchange rate stability for the EC as a basis for further economic integration.

It appears now that many of these concerns were exaggerated. The EMS, in its first three years, worked smoothly in an operational sense, (which in itself is an achievement considering the complex features of the system), and it was, by and large, able to avoid major disruptions and crises. There have been six realignments, directly involving from

one to four currencies, ^{1/} which were carried out with reasonable smoothness. The first three realignments, in 1979 and 1980, were certainly not large enough to cause any disruptions in markets; in fact, the changes in central rates were almost fully absorbed by the existing width of the EMS band without significantly affecting market rates. Nor were the adjustments frequent enough to raise doubts about the claim that the system provided a framework for exchange rate stability. The situation has changed somewhat since mid-1981. Tension within the EMS has increased, and at times large interventions have been necessary to safeguard existing central rates. Three realignments took place between October 1981 and June 1982. In each the largest bilateral change of central rates went beyond any previous realignment in the EMS or under the "snake." ^{2/} While in September and November 1979 the maximum bilateral adjustment was 5 per cent, it reached more than 9 per cent in February and 10 1/2 per cent in June 1982. As a result of the last three realignments, the central rates of the mark and the guilder rose cumulatively by some 20 per cent against the French franc and the Belgian franc.

In general terms, it seems that inflationary impulses have been caused either by events outside the EMS (mainly the second round of oil price increases in 1979/80) or by domestic developments, in particular budgetary or wage developments; there is little evidence that the EMS caused inflation to be transmitted from one participant to another to a greater extent than would have been the case otherwise.

Equally, it appears that in virtually all EMS countries during that period the impediments to growth stemmed essentially from both a recognized need to curb domestic inflation decisively and from a worldwide climate of stagnation. In general, they cannot properly be attributed to the consequences of measures introduced to maintain balance within the EMS. To be sure, at times certain measures, in particular interest rate actions, were taken in response to temporary developments in the EMS. But it could be said that, in view of the worldwide trend toward higher interest rates and the general need for more restrictive policies in EMS countries, these measures would anyway have had to be introduced, and that at most it was their timing which was influenced by the constraints of the EMS.

^{1/} This is a somewhat misleading observation since in an integrated system of a limited number of exchange rates, all participating currencies are affected by action on one or more exchange rates. This is clearly shown by the fact that the adjustment of any number of ECU central rates of EMS currencies leads to simultaneous changes in the ECU central rates of all EMS currencies.

^{2/} It should be kept in mind, however, that the weaker currencies left the "snake" at various times and subsequently depreciated significantly.

2. Exchange rate developments

A number of distinct periods of strain within the EMS can be distinguished (Table 1). During some of these, the authorities attempted to resist changes in central rates by substantial intervention in the exchange market, or by measures of short-term monetary policy directly motivated by exchange rate considerations. Within months of each of these episodes, and in the absence of more far-reaching measures aimed at the correction of the underlying causes of imbalances, confidence in the will and capacity of the authorities to continue to resist the adjustment of central rates diminished, thus amplifying pressure on the rates. In each case, the renewed pressures ended with an adjustment of central rates.

Other periods of strain appear to follow a different pattern. In the case of the devaluation of the Danish krone in November 1979, the authorities acted quickly, without a lengthy period of intervention. On two other occasions, both centered around a weak deutsche mark (October 1980 and February 1981), market pressures were successfully resisted. The ability of the authorities to resist market forces was a reflection of the substantial foreign exchange resources available and, in the second instance, of the forceful measures of monetary policy taken in February 1981. Ultimately, market sentiment reversed itself when it was seen that Germany continued to have a better price performance than its partners in the EMS and that an improvement in its current account could be expected.

These episodes appear to be very much in line with those of other countries outside the system--intervention against market pressure serves to buy time, but in the absence of policy measures aimed directly and with sufficient strength at the underlying causes of weakness, exchange rate changes become inevitable in the course of time.

It was early recognized that differences in the relationships between the participating currencies and the U.S. dollar could give rise to tensions within the EMS. ^{1/} When the dollar is relatively weak, mobile international capital seeks alternative locations, and particularly tends to move to the deutsche mark and vice versa. With the United Kingdom not actively participating in the EMS, currencies other than the deutsche mark play only a limited role as alternative reserve and investment currencies. Consequently, there is a tendency for the mark to be strong against other European currencies, when the dollar is weak, whether or not underlying economic developments dictate this.

After a short period of strength at the start of the EMS in March 1979, the U.S. dollar remained relatively weak with respect to most EMS currencies from the middle of 1979 to the beginning of 1980 (Chart 1).

^{1/} Chart 1 depicts the history of the ECU/dollar rate, and Chart 2 illustrates the positions of the member currencies within the EMS band. Chart 3 shows the ECU exchange rates of the participating currencies.

In September 1979, the first realignment ^{1/} under the EMS occurred with the deutsche mark being revalued by 5 per cent against the Danish krone and 2 per cent against other EMS currencies. The Danish krone was again devalued by 5 per cent against all other currencies on November 30, 1979.

From early 1980 to early 1981, the U.S. dollar strengthened on average with respect to EMS currencies; there were, however, substantial short-term fluctuations. Early in 1981, an easing of U.S. interest rates and the tightening of monetary policy in Germany caused the joint float to firm temporarily relative to the dollar. An acceleration in inflation and increasing current account difficulties put pressure on the Italian lira within the EMS, triggering substantial intervention by the authorities in February and early March, and leading ultimately to the third realignment, on March 23, 1981, when the lira was devalued by 6 per cent relative to the other EMS currencies. The joint float depreciated relative to the dollar from mid-April until August 1981, with the deutsche mark at the top of the band and the French franc at the bottom after its sharp fall following the Presidential elections of May 10, 1981.

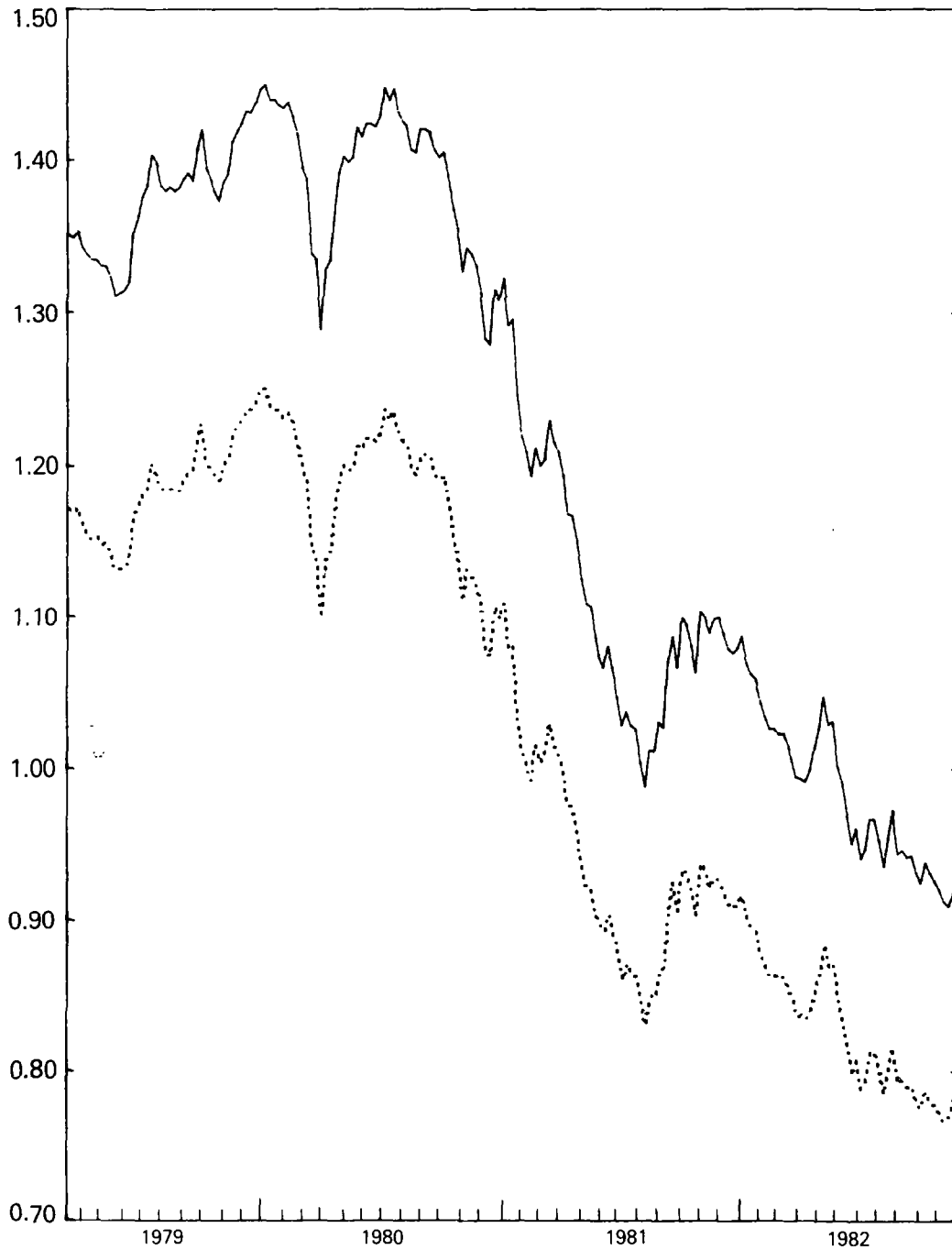
From mid-August 1981 to December 1981, the situation reversed with the EMS currencies on average appreciating relative to the dollar. There was renewed confidence in the deutsche mark, as the German current account performance improved and inflation moderated. At the same time, doubts about the stability of the French franc and uncertainties about the policy stance of the new French administration increased. Worsening inflation and a widening trade deficit put renewed pressure on the lira. These tensions led to the fourth realignment, on October 5, 1981, with the deutsche mark and Netherlands guilder revaluing by 5.5 per cent, and the French franc and Italian lira devaluing by 3 per cent against the Belgian/Luxembourg franc, Danish krone, and the Irish pound, which remained unchanged.

The early months of 1982 were characterized by a widening interest rate differential favoring dollar-denominated assets and a firming of the dollar against the joint float. The Belgian franc came under growing pressure in early February, against a background of serious budgetary and current account imbalances and growing external indebtedness. The fifth EMS realignment, effective from February 22, 1982, consisted of an 8.5 per cent devaluation of the Belgian and Luxembourg francs and a 3.0 per cent devaluation of the Danish krone, against all other EMS participants.

Pressure against the French and Belgian francs and the Italian lira rose again from mid-April 1982. A widening trade deficit and continuing high inflation were major causes in each case. The result was

^{1/} Detailed information on all the realignments is provided in Tables 3-6. Tables 3-5 provide information on market rates and their changes, and Table 6 outlines policy measures, taken in connection with realignments.

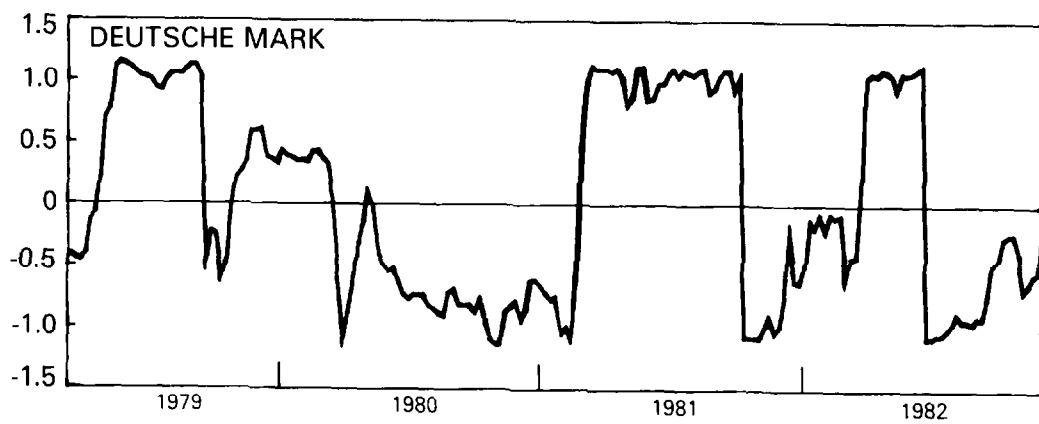
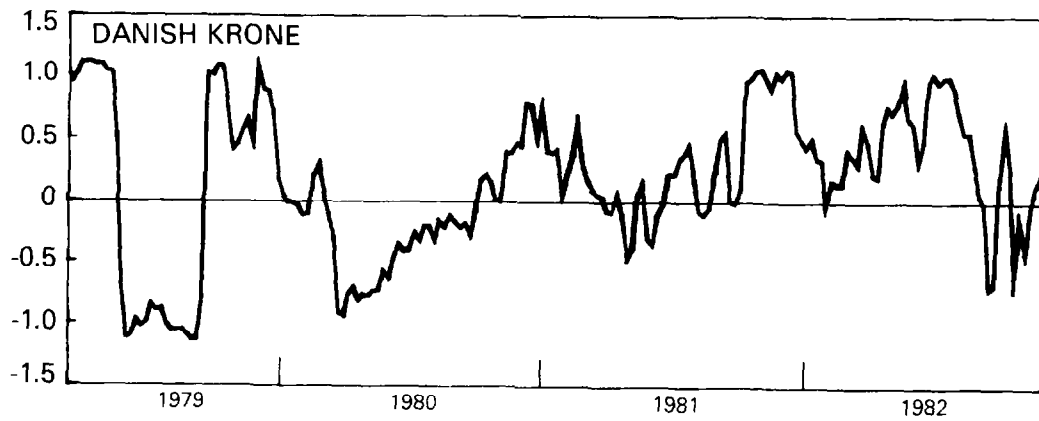
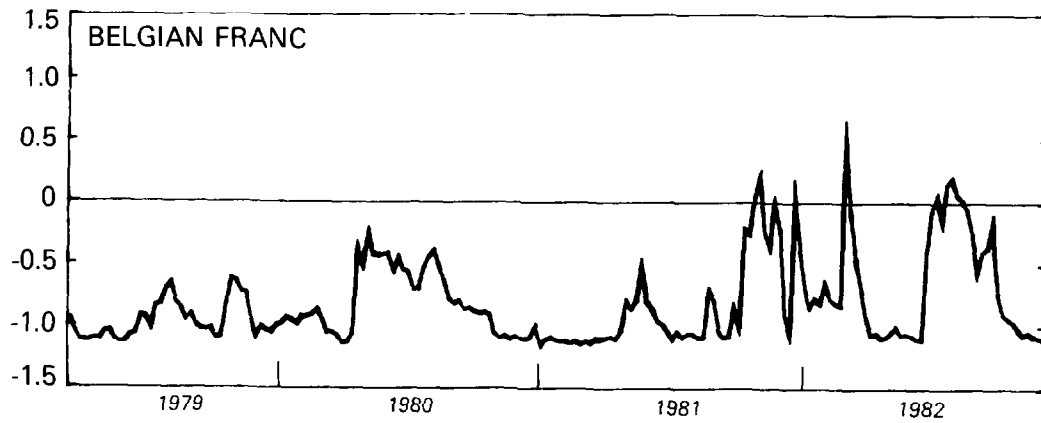
CHART 1
EXCHANGE RATE OF THE ECU AGAINST THE DOLLAR¹
(In dollars per ECU)



Source: Staff calculations.

¹The lower line excludes the pound sterling component.

CHART 2A
POSITIONS WITHIN THE EMS BAND¹



Source: Staff calculations.

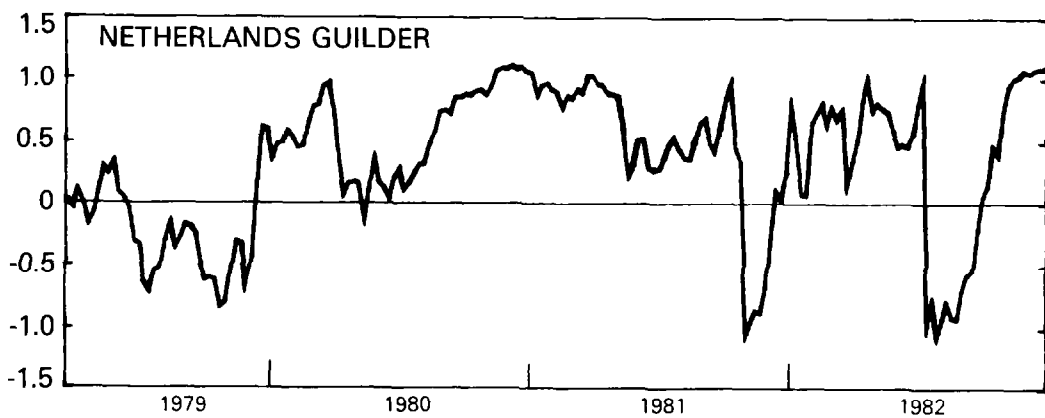
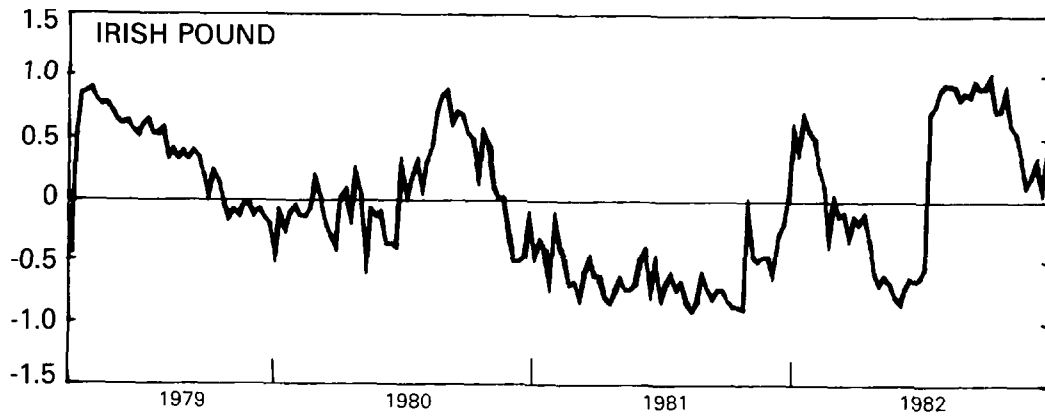
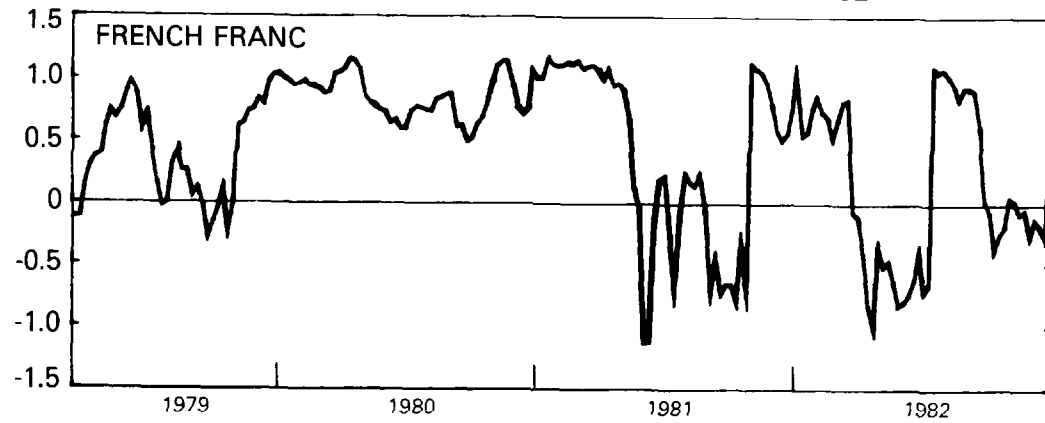
¹ Deviations from central positions (average of the highest and lowest spreads) within the narrow EMS band.



134

CHART 2B

POSITIONS WITHIN THE EMS BAND¹



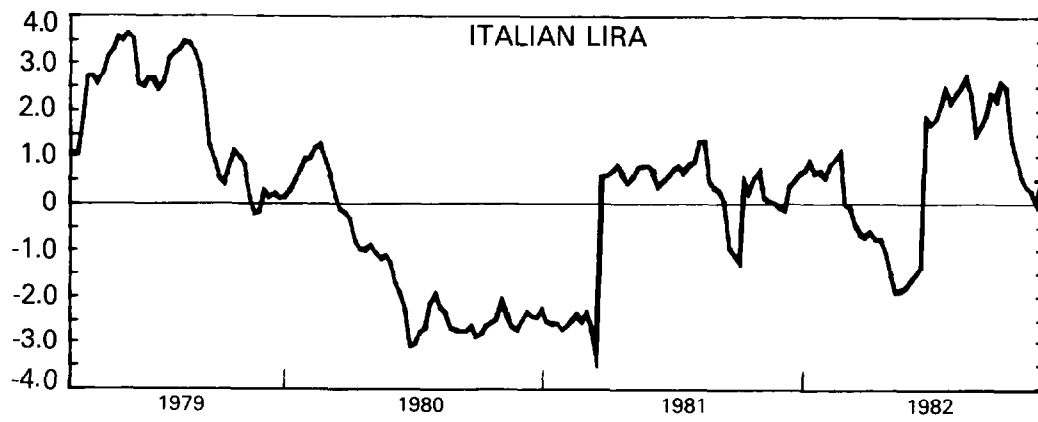
Source: Staff calculations.

¹ Deviations from central positions (average of the highest and lowest spreads) within the narrow EMS band.



CHART 2C

POSITION WITHIN THE EMS BAND¹



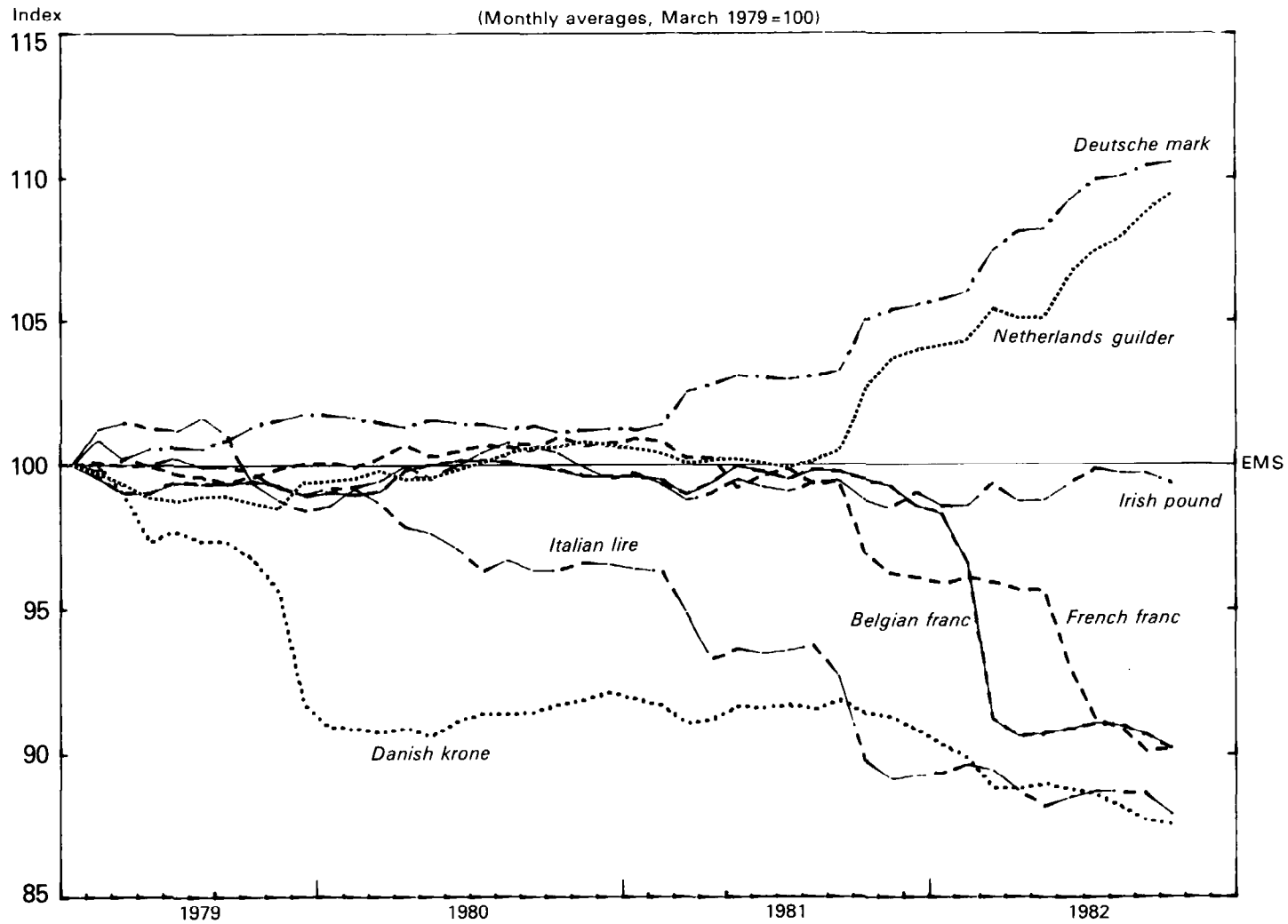
Source: Staff calculations.

¹ Deviations from central positions (average of the highest and lowest spreads) within the narrow EMS band



CHART 3

MOVEMENT OF EMS CURRENCY EXCHANGE RATES AGAINST THE EMS¹



Source: EC Commission and staff calculations.

¹ECU without sterling component.



the sixth EMS realignment, effective from June 14, 1982: the French franc and Italian lira were devalued by 5.75 per cent, and 2.75 per cent, respectively, while the deutsche mark and the Netherlands guilder were revalued by 4.25 per cent each against the remaining EMS currencies. This realignment was the largest since the inception of the system in terms of the magnitude of bilateral exchange rate changes.

The size and frequency of central rate realignments have increased significantly during the three years of the system's existence. This trend suggests that the drive for greater economic convergence in order to generate exchange rate stability has been successful only to a very limited extent. The increasing size and frequency of realignments also indicates that the disciplinary effect of fixed exchange rates is not itself sufficient but that, additionally, determined and sustained domestic adjustment efforts are required.

A variety of policy measures has accompanied EMS realignments (Table 6), but only at the most recent realignment in June 1982 were the accompanying measures directly stated in the communiqué announcing the realignment. On that occasion, there was explicit mention of the measures that France, devaluing the franc by 10 per cent against the mark and the guilder, would take, as well as of the less precisely specified measures that Italy, devaluing the lira by 7 per cent against the mark and guilder, would adopt. This does not, of course, mean that other realignments have remained unsupported by economic measures. The devaluation of the Danish krone in November 1979 was part of a larger package of policy measures, as was the case with the devaluation of the Belgian franc in February 1982, and those of the French franc in October 1981 and of the Italian lira in March and October 1981.

3. Variability of exchange rates

Foremost among the objectives of the EMS is securing a high degree of exchange rate stability, as a basis for further economic integration. It is chiefly this objective which is supported by the institutional arrangements of the EMS. Central rate changes are subject to a multilevel consultation and decision-making process; furthermore, the implications of such changes on other aspects of EC policies need to be taken into account. At the beginning of the EMS, all this had led to the fear that needed exchange rate changes might not be undertaken in time nor to the extent required. The danger of competitive devaluations, on the other hand, was seen as remote.

In the event, the exchange rate system of the EMS proved to be much less rigid than initially feared. More recently, following the three relatively large realignments between October 1981 and June 1982, voices have been raised querying whether exchange rate changes have not been used too much, instead of stronger domestic adjustment measures and

greater efforts to achieve more convergence in economic policies and developments. It is being asked whether too frequent changes in official exchange rates did not erode a system which was intended "to create a zone of monetary stability" in Europe and replaced it by a mechanism akin to a multilateral crawling peg.

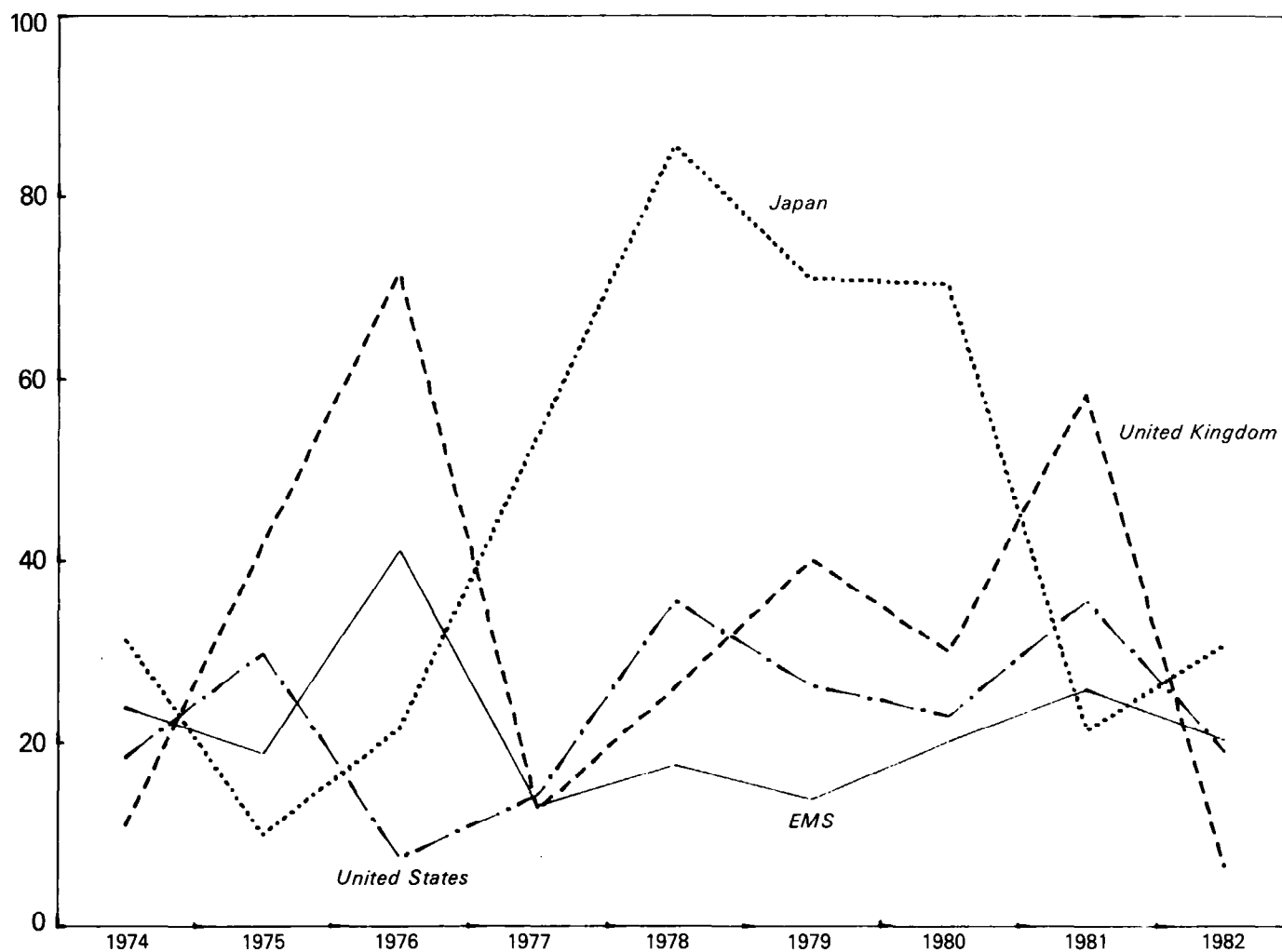
The question of the degree of exchange rate stability achieved in the EMS may be approached first by comparing the experience of the EMS countries among themselves before and after the implementation of the system. Secondly, exchange rate stability for the currencies in the EMS can be compared with those of major currencies outside the EMS. This section examines the variability of both real and nominal exchange rates before and after the establishment of the EMS in March 1979. The question at issue is whether or not the EMS has had a stabilizing effect on the exchange rates of the participating currencies. Ideally, variability should be measured relative to the equilibrium exchange rate over time for a currency, but this is well beyond the scope of this paper. Here, variability is measured by the coefficient of variation (standard deviation divided by the average) over a sample period. The variability of exchange rates of EMS currencies can then be compared both before and after the introduction of the system and with the variability of the exchange rates of non-EMS currencies over the same periods. Clearly, such comparisons are sensitive to the choice of comparator currencies, to the frequency of the data, and to the exchange rate measure used. Because of this, results are reported for differing time intervals, and for several different measures of exchange rates. Nevertheless, the results should be interpreted cautiously. A particularly important qualification is that the exchange rate experience of European currencies before the introduction of the EMS varied markedly, with the role played by the "snake" being of notable importance.

The variability of exchange rates of EMS currencies appears to have declined since the system was introduced, compared with a number of non-EMS currencies inside and outside Europe (Chart 4). For all EMS currencies, except the Danish krone, average variability in 1979-81 was less than in 1974-78 (Table 7). ^{1/} It may at first appear surprising that the average variability of the nominal effective exchange rates of the five non-EMS European countries considered declined by a similar degree as the EMS currencies over 1979-81, compared to 1974-78. On reflection, this is less so, given the close economic and financial ties between all European countries, whether EMS participants or not, and given the formalization of these links in the exchange rate regimes of several of the countries concerned. The Austrian schilling rate is closely associated with the EMS currencies, in particular, the deutsche mark, and the Swiss franc rate, although largely market determined, is heavily influenced by developments in its EMS neighbors. Both Norway and Sweden peg their exchange rates to baskets of currencies in which

^{1/} In Chart 4 and Table 7, variability is measured by 1,000 times the coefficient of variation of the nominal effective exchange rate (monthly data).

CHART 4

VARIABILITY OF NOMINAL EFFECTIVE EXCHANGE RATES, 1974-82¹



Source: *International Financial Statistics*, and staff calculations.

¹Variability is measured by the coefficient of variation (standard deviation divided by the average) multiplied by 1000, of the nominal effective exchange rate. Data for 1982 relate to the first nine months only.



the combined weight of EMS currencies is 33 per cent (since August 1982, 44 per cent) and 44 per cent, respectively. 1/

Of the non-EMS European currencies considered, only the pound sterling is less dependent, directly or indirectly, on the behavior of EMS participants. Consequently, it is to be expected that the pound sterling is the only European currency, inside or outside the EMS, to exhibit a major rise in average exchange rate variability after the system's introduction (Table 7). Although inferences are difficult to draw, it appears that the operations of the EMS have had a moderating effect on the exchange rate variability of the participating currencies, with this influence spreading to those European currencies outside the system which have close economic and financial ties to the participants. In contrast to the experience of most European currencies, the exchange rate variability of the U.S. dollar and the Japanese yen has risen sharply since 1979 (Table 7).

Predictably, the average variability of each of the EMS member currencies with respect to the rest of the EMS group diminished after the introduction of the system (Table 8). This is presumably the minimum achievement one would expect. The variability of the non-EMS European currencies (with the exception of the pound sterling) relative to the EMS group also diminished after the system's inception (although to a lesser degree) which could be expected since these currencies are closely linked to the EMS currencies. The average variability of the dollar and yen exchange rates relative to the EMS group on the other hand, increased sharply after the introduction of the system. The variability of the non-EMS currencies considered relative to their own group has also risen somewhat since the inception of the EMS (Table 9).

The real exchange rates 2/ of EMS countries have, as well, become less variable relative to their own group (Table 10) and more variable relative to currencies outside the joint float (Table 11), since the system was instituted.

In sum, it appears that the exchange rate variability of the EMS currencies has diminished since the introduction of the system, and that this stabilizing influence has spread to the exchange rates of other

1/ If the indirect effects of EMS exchange rates on third currencies also in the baskets were taken into account, these proportions would be even higher.

2/ In a way, the behavior of real exchange rates is not relevant here since the stabilizing effect of a system with fixed exchange rates affects in the short run only nominal exchange rates. On the other hand, developments of real exchange rates reveal whether divergencies between exchange rates and cost and price developments arise or whether such divergencies have been compensated for by changes in central rates. Hence, developments in real exchange rates can be seen as composite indicators for the stability of nominal exchange rates and the achievement of convergence in cost and price developments.

currencies which do not participate directly, but which have close ties to the EMS participants. This has happened at a time when the variability of the exchange rate of those currencies not directly tied to the EMS (principally, the pound sterling, the U.S. dollar, and the Japanese yen) appears to have risen.

4. The problem of convergence

a. The EMS concept of convergence

The concept of convergence, which has become widely used in the context of economic integration, needs to be given some precision of meaning. In general, convergence means a development in which economic variables move closer to each other over time. By itself, however, the concept of convergence neither identifies the variables under consideration nor the direction of their movements. 1/

The ultimate aim of the European Communities in the economic field is "to ensure the economic and social progress of their members" and "the constant improvement of the living and working conditions of their people" (Preamble of the EEC Treaty). From the beginning of the EC, there have been efforts to reduce regional disparities among member countries. The lending activities of the European Investment Bank (EIB), the Social Fund, and the Regional Fund, and--more recently--the New Community Instrument ("Ortoli Facility") are directed toward these aims. In connection with the establishment of the EMS, it was decided to lend support to the strengthening of the economic potential of those less prosperous member countries, which are fully participating in the EMS by subsidizing interest rates on loans from the EIB, and the New Community Instrument. 2/ Italy and Ireland are the countries benefiting from those measures.

A reduction of disparities among EC member countries is, however, a goal in itself and not necessarily a condition for economic integration. Disparities are present within individual countries and sometimes are as pronounced as among different countries. By contrast, it has long been recognized that economic and/or monetary integration requires a certain degree of "harmonization" or "convergence" in economic policies and developments. While the EMS is expected to contribute to the longer-term aims of the EC, it has as its specific aim the creation of "a zone of monetary stability in Europe," encompassing "greater stability at home and abroad" (December 1978 Resolution). "Stability abroad" is equivalent to exchange rate stability, and from many references, it is

1/ The European Commission introduced a useful distinction between "convergence of nominal variables," such as costs and prices, and "convergence of real variables," such as living standards and quality of life. See European Economy, No. 12, July 1982, p. 14. This publication contains many documents and technical studies relating to the EMS.

2/ See December 1978 Resolution of the European Council, Section B.

clear that "monetary stability at home" is to be interpreted as domestic monetary developments consistent with stability of costs and prices. 1/ Both the stability of exchange rates as well as of costs and prices are seen as essential preconditions for further economic integration among EC countries for future economic growth and the narrowing of differences in living standards.

It had been hoped that the EMS would promote greater convergence of economic policies and developments and eventually facilitate economic integration. So far, however, such hopes have not been fulfilled as convergence of policies, particularly monetary policies, has been insufficient to maintain complete exchange rate stability. The lack of harmonization of policies has been reflected in a lack of convergence of economic performance and, in particular, of cost and price developments. An interesting possibility, however, and indeed an opinion held by many, *is that the existence of and the constraints imposed by the EMS have helped to prevent a greater divergence of economic developments in the participating countries.*

While the following reviews summarily price and monetary developments, reference is made to more detailed studies by the EC Commission and various authors. 2/

b. Price developments

The level and dispersion of inflation rates is of central importance for evaluating the extent of convergence toward monetary stability within the EMS. In 1979 the preconditions for convergence appeared to be improving both within and outside the EC. Inflation rates had been dropping or stabilizing since 1975 both in terms of consumer prices and GDP deflators. At the same time differences between the highest and the lowest inflation rate of the member countries were diminishing, reaching their minimum in 1978 (Table 12).

The launching of the EMS roughly coincided with the second oil shock which caused an increase of inflationary pressures. The response to these pressures varied considerably between countries, leading to a renewed increase in inflation differentials. Thus, while consumer prices in Germany rose by 16.3 per cent from 1978 to 1981, they increased by 37.5 per cent in Denmark, 42.2 per cent in France, and 63.9 per cent in Italy. By the end of 1982 a major convergence of inflation rates was not yet in sight. However, inflation differentials had fallen somewhat from their 1980 levels.

1/ See, e.g., "Conclusions of the Presidency of the European Council Meeting in Luxembourg," April 27/28, 1980, in: Bulletin of the European Communities, No. 4, 1980, p. 10; European Economy, No. 12, July 1982, pp. 14, 40, and 42; European Economy, No. 14, November 1982, p. 94.

2/ See, e.g., European Economy, July 1982, "Part One - Economic Convergence and the European Monetary System"; and N. Thygesen and M. Emerson (see bibliography).

Inflationary developments in selected countries outside the EMS since 1979 were broadly similar. The differences in inflation rates were, however, not as pronounced as those within the EMS (Chart 5 and Tables 12-13).

c. Monetary developments

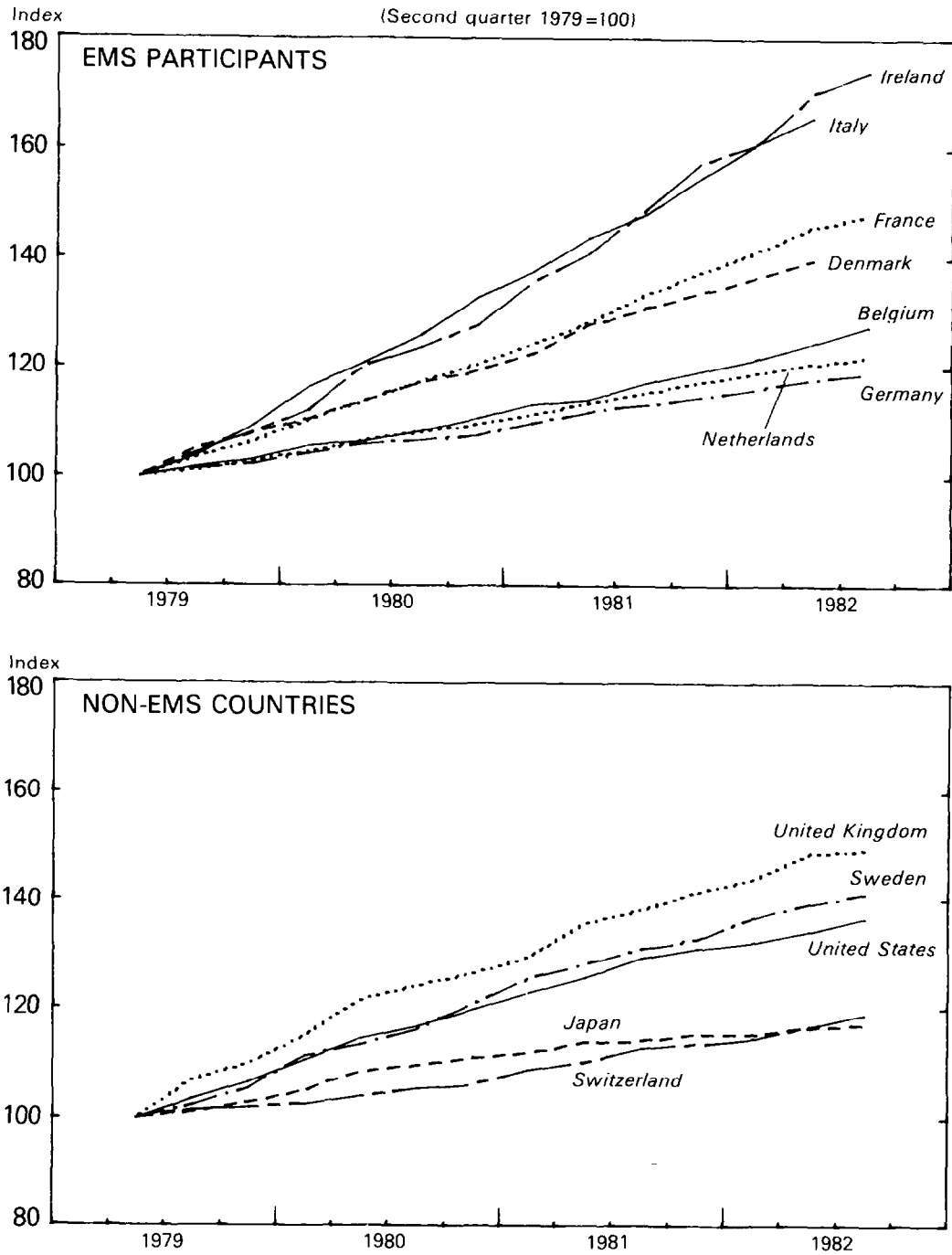
Since 1979 very pronounced and similar rises in nominal domestic interest rates have taken place in the countries concerned, partly in response to the large interest rate increases in the United States. In most countries participating in the EMS, nominal interest rates were 2-4 percentage points higher in 1979-81 than in 1976-78. Because interest rate changes in the medium term were unrelated to actual changes in the inflation rate (Chart 6 and Tables 12-15), real interest rates generally increased most in countries with a decreasing or stable rate of inflation. Real interest rates rose especially sharply in Germany, Denmark, Belgium, and the Netherlands, while the increases were less pronounced in France, Ireland, and Italy.

The EMS period saw a definite increase in the correlation between interest rate movements in participating countries (Tables 16-17). There are good reasons to attribute part of this convergence of interest rate developments to the establishment of the EMS and to monetary measures taken in this context. Larger EMS countries, especially Germany, have used the rate of growth of monetary aggregates as normative, intermediate goals of monetary policy. As stability of the exchange rate is especially important for the smaller EMS countries with very open economies, monetary policy in these countries has often been geared to achieve external stability. This has had a tendency to equalise interest rate developments within the EMS. Monetary expansion within the small countries has, however, remained partly outside the control of the authorities.

The medium-term rise in interest rates in most countries has been accompanied by a decelerating growth of the nominal money supply (Chart 7 and Tables 18-19). The change in the growth rate of both narrow and broad money was, however, very different in individual countries.

The rate of domestic credit expansion is perhaps of greater interest as an indicator of the determination and success of the authorities in controlling monetary developments (Chart 7 and Table 20). This rate is, like the other monetary aggregates, quite different in the various participating countries. Developments appear, however, to have converged somewhat during the EMS period. In all participating countries (with the exception of Denmark) credit expansion was then, on average, slower than or about the same as that experienced in the period 1974-78. The rate of domestic credit expansion has generally decreased more for countries with a high rate of expansion in the period preceding the introduction of the EMS.

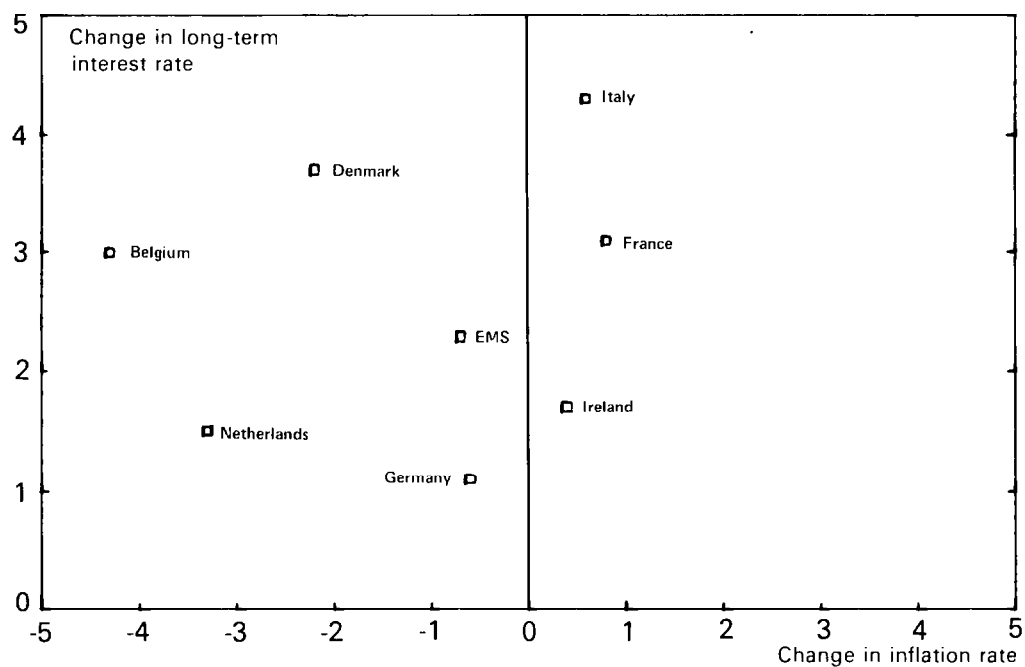
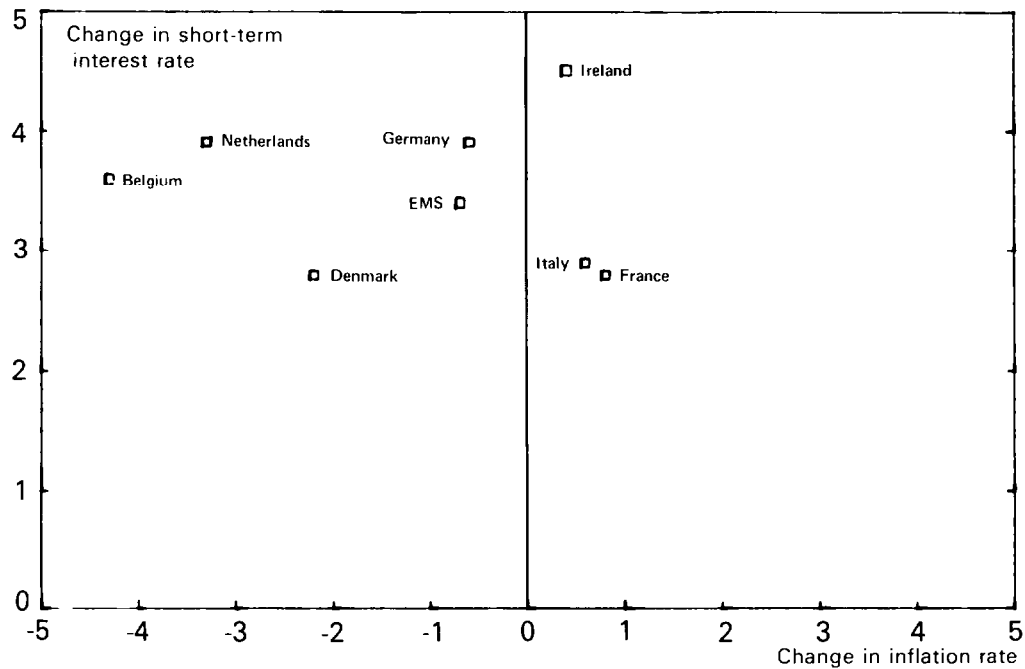
CHART 5
CONSUMER PRICES



Source: International Financial Statistics



CHART 6
CHANGES IN INTEREST RATES AND PRICES¹
(Average change from 1974-78 to 1979-81 in percentage points)



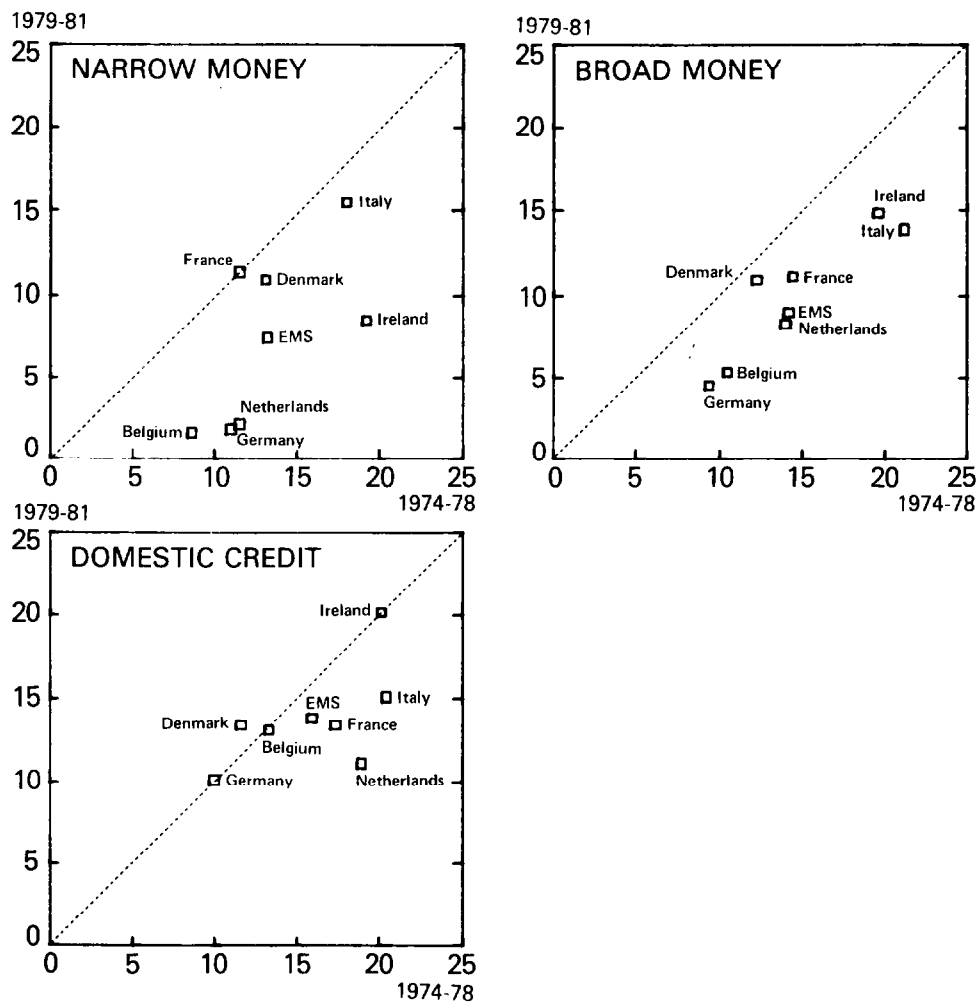
Source: *International Financial Statistics* and staff calculations.

¹Vertical axis: change in average interest rates from 1974-78 to 1979-81. Horizontal axis: change in GDP deflator from 1974-78 to 1979-81. The higher up and more to the left a country lies in the diagram, the more real interest rates have increased

CHART 7

MONETARY EXPANSION BEFORE AND AFTER THE INTRODUCTION OF THE EMS¹

(Average annual change for 1974-78 and 1979-81 in per cent)



Source: *International Financial Statistics*, and staff calculations.

¹Countries on the diagonal have the same average monetary expansion rates in 1979-81 as in 1974-78. Countries below (above) the diagonal have a lower (higher) rate of monetary expansion in 1979-81 than in 1974-78. The greater the distance from the diagonal the greater is the difference in the average rate of monetary expansion between the two periods.



The development of the real money or credit supply is often considered a more reliable indicator of monetary stringency than the expansion of purely nominal variables. Deflating the monetary aggregates with the GDP deflator produces measures of real monetary expansion which are as widely divergent during the EMS period as before it. On the other hand, correcting monetary developments for changes in the consumer price index indicates that the rates of real monetary expansion have been, on average, more similar in 1979-81 than in 1974-78 (the evidence is weakest in the case of credit expansion). ^{1/}

During the EMS period, there has also occurred a general rise in the general government borrowing requirements relative to increases in the money supply (Table 25). These developments to a large extent reflect the result of the "automatic" effects of the onset of recession in 1980 on tax receipts and transfer outlays, as well as the different timing and impact of financial policies as the recession developed.

5. Factors influencing the performance of the system

As shown above, the trend toward a higher degree of convergence in economic performance among EMS countries, which was evident mainly in price performance during the two years prior to the establishment of the EMS, did not continue afterwards but rather reversed itself. In particular, inflation differentials between Germany and the Netherlands on the one hand, and France and Italy on the other hand, grew larger over time. One would have expected these divergences to create major tension within the EMS. Expectations at the outset were that the mark would remain strong within the EMS, while concern over future developments concentrated on the French franc and the Italian lira. However, the EMS operated smoothly and free of major disruptions, at least up to mid-1981.

One apparent reason for this is that the French franc and the Italian lira entered the EMS with exchange rates somewhat undervalued against most other EMS currencies, while the deutsche mark may have been overvalued. At the same time, the U.S. dollar was significantly undervalued against all EMS currencies. As the situation reversed itself, in particular since May 1980, the deutsche mark weakened within the EMS, and somewhat later, in line with the EMS as a whole, also against the dollar.

One important factor in this development was the the role of the deutsche mark as an alternate reserve currency; another was the current account development of Germany. The German current account deteriorated dramatically from the second quarter of 1979 because of the changing relative cyclical position and a delayed response to the deterioration of competitiveness, but also, as in the case of other EMS countries, because of the second round of sharp oil price increases. The impact of current account developments on exchange rates was exacerbated by develop-

^{1/} Because annual expansion rates have continued to fluctuate widely for individual countries, average annual dispersion measures, nevertheless, remain high (Tables 21-23).

ments in the capital account. The reputation of the mark as a steadily appreciating currency, and thus as a safe haven, was undermined. Interest rate developments added pressure on the mark while supporting the U.S. dollar as well as other EMS currencies, such as the French franc. Lastly, there were political developments which cast a spell over the mark and favored the dollar as well as, temporarily, the French franc.

The authorities have also on various occasions taken external or domestic measures designed to cope with the consequences of divergence, to ensure some degree of convergence or at least avoid more divergent developments. The existence of the EMS and the resulting exchange rate constraint in some countries have induced (and have been used in the public debate as an argument for) a stronger domestic adjustment effort by modifying wage indexation provisions (Denmark, Belgium), or introducing more restrictive budget policies (Belgium, France, Denmark).

As the initial moderating effects which contributed to a smooth beginning of the EMS have worn out, and as no clear signs of a noticeable convergence of economic policies and developments can be detected, while recourse to measures of a temporary and bridging character (such as interest rate changes or foreign borrowing) may become more difficult, it might well be that tensions within the EMS increase. It appears that in principle the following main options for action remain open to EMS authorities, short of abandoning the EMS in its present form. On the one hand, further changes in EMS central rates may have to be made. On the other hand, more substantial domestic adjustment programs will have to be put in place by the countries with less stable currencies and with serious payments problems as it seems difficult to imagine that the stability-oriented countries will be prepared to compromise their policy stance and agree to an "average" degree of convergence in terms of monetary expansion and inflation. The countries under pressure could combine medium-term programs for stabilizing and restructuring their economies with recourse to longer-term external financing. It is also obvious that the first option, more frequent exchange rate action, would nevertheless require supportive domestic measures to ensure success.

III. The Evolution of the System

1. Operational aspects

The European Council Resolution of December 1978 established the framework for the European Monetary System and the Agreement between the EC central banks provided the operating procedures. The operation of the EMS from the beginning has been characterized by two elements: it has been flexible in many of its technical aspects, and it has been run efficiently and smoothly by the participating central banks. The Central Bank Agreement was never intended to lay down rigid and unalterable rules for the system. The wording of the Agreement leaves room for flexibility and thus allows a gradual evolution of the system over time

as experience is gained. In some important aspects of the system (such as currency of intervention, maturity of loans, or means for settlement of such loans), the provisions of the Agreement apply only "in principle," leaving open the ways how new problems may be handled with the mutual agreement of the parties concerned.

This high degree of flexibility can be explained by a number of factors. The EMS--as is true for many aspects of EC policies--is primarily an institution not so much of a technical but mainly of a political nature, where technical means are used toward political objectives. It was conceived as a first important step on the way to a much more ambitious but also fairly distant goal: monetary union. The flexibility of the system was seen as necessary because of varying institutional settings and different approaches to many common problems among the participating central banks; it was workable because the central banks concerned, which are limited in number, have a long-standing tradition of close cooperation in foreign exchange matters, stemming in particular from the operation of the "snake." The Committee of Governors of the central banks of the EC and its working parties meet regularly and frequently, normally in Basle, in connection with the monthly meetings of the BIS. All questions which arise in connection with the functioning of the system, be they of a more technical nature or touching upon more fundamental questions of external or domestic monetary policy, are discussed during these meetings. The four daily telephone consultations between all EC central banks on exchange rate matters usually provide, on the level of foreign departments, an exchange of information on market developments and intervention activities, and offer a readily available channel for consultation on higher levels as the need arises. (The central banks of Norway, Sweden, Switzerland, the BIS, and the Federal Reserve Bank of New York, as well as, less directly, the central banks of Canada and Japan, are associated with this network of information.) The Monetary Committee of the EC regularly brings together high officials from central banks and finance ministries. The central bank governors also frequently attend meetings of economics and finance ministers of the EC member countries. The EC Commission is represented on the appropriate level on all the committees and at all the meetings which have been mentioned.

The following sections attempt to describe the evolution of some key operational features of the EMS. This survey is not exhaustive nor has it been possible to bring it, in all respects, completely up to date. Many aspects remain in flux and some details may not be known to the staff, due to their confidential nature.

a. Exchange rate and intervention mechanism

The EMS agreement stipulates that intervention be effected in principle in currencies of the participating central banks, and be unlimited in amount at the obligatory intervention limits. This provision allows intervention in third currencies which normally takes place before the

intervention points are reached. It also allows intervention in participating currencies before the intervention limit is reached ("intra-marginal intervention"), which is, however, subject to prior approval of the partner central bank in whose currency intervention is to take place.

In the first three years of the EMS, more than half of intervention by EMS participants has been effected in third currencies, predominantly in dollars. For this there exist a number of reasons. At first, such intervention may have primarily, but neither necessarily nor exclusively, served the purpose of influencing the exchange rate relationship between the currency of the intervening central bank and the third currency in question. Secondly, a number of central banks prefer to intervene before their currency reaches its obligatory intervention limits because they want to avoid larger fluctuations, even within the band of the EMS. Or, because they consider it important to counter exchange rate movements at the beginning before they gather momentum on their own; in this way, they may hope to achieve their exchange rate objectives with a smaller change in their reserve position. For such purposes, these central banks may use dollars for intervention instead of intramarginal intervention in participating currencies, since the latter requires the consent of the central bank whose currency is being used. The Italian authorities, in view of the wider fluctuation margins of 6 per cent for the lira, have consistently followed a policy of not allowing their currency to reach its intervention limits, and have consequently intervened in dollars (see Chart 2C, page 8d). Ireland also prefers to observe a narrow band for the Irish pound; it traditionally intervenes in British pounds due to its close economic and financial ties to the United Kingdom, but, since 1981, also uses the dollar.

Of intervention in EMS currencies during the first three years, again more than half consisted of intramarginal intervention. Since the automatic financing provisions of the very short-term financing facility apply only to obligatory intervention at the limits, a central bank which would like to intervene intramarginally in another EMS currency would at first need to have a sufficient amount of the currency in question at its disposal. While this could be done by acquiring such currency on the market during earlier periods of strength, the EMS Agreement limits the holding of such currencies to working balances. Alternatively, the central bank would have to obtain the currency by agreement from the issuing central bank. Such agreements have at times been concluded when the interests of the two central banks could be reconciled, for instance in the form of swap agreements which allowed a reversal of the transaction after a certain time. For the creditor central bank, such an agreement had the desirable effect of also cancelling the liquidity-creating effect of the initial intervention. The choice of intervention currency is, of course, of interest with regard to its consequences on the overall creation of international liquidity and its impact on the exchange rates of the currencies involved.

b. Divergence indicator

In the early phases of discussions about the EMS, there was a proposal that the exchange rate mechanism should be based not on a grid of bilateral parities--as it was in the "snake"--but directly on the ECU. Under such a system, for each currency a central rate in terms of the ECU would be declared, and fluctuation margins would be defined against the ECU (instead of against other currencies); countries would be obliged to keep their currencies within these margins. In the event this idea was not accepted, mainly for two reasons. The first one is of a general nature. While such a system, requiring any central bank to intervene whose currency diverges by a given margin from its ECU central rate, would support efforts to achieve a higher degree of convergence, it would do so irrespective of the desired direction of convergence. Secondly, as a technical point, though with important policy implications, there would be the problem of determining the "partner" currency for intervention. Since under such a system, frequently only one currency would reach its intervention point in terms of the ECU, the selected or designated intervention partner would become an "involuntary" creditor, who would have to accept the creation of more liquidity in its own currency, or an "involuntary" debtor who would have to suffer the loss of reserves. In the end, the parity grid became the basis for the exchange rate and intervention mechanism, and the ECU-based divergence indicator became a supplementary device, functioning as a warning system. By inviting consultations and creating a "presumption" for corrective action, the indicator became a factor in promoting policy coordination.

Nevertheless, the role of the divergence indicator remains ambiguous. While being in line with the desire expressed in the December 1978 Resolution, to balance the burden of both deficit and surplus countries, the indicator would promote convergence not necessarily toward monetary stability but rather toward some average level of monetary and price developments. This ambiguity may have been one reason why the divergence indicator appears not to have played the role it was expected to play. There are other reasons, some of them of a more technical nature. First, signals of the divergence indicator cannot automatically trigger action, but can only attempt to induce such action. Second, the very design of the indicator, based on a composite of all the currencies, causes it to respond only in situations where one currency is clearly divergent from the average of the other currencies. If two currencies would strongly move in opposite directions, it is most likely that neither currency would cross its divergence threshold. This explains also why, in certain cases, a currency may reach its intervention limit under the parity grid before reaching the divergence threshold, thus diminishing the ability of the divergence indicator to act as an "early warning system." Lastly, the inclusion of the pound sterling, which does not participate in the exchange rate mechanism,

in the ECU as well as the application of wider margins for the lira, have at times resulted in some distortions, in spite of the adjustments in the calculation of the divergence indicator eliminating the movements of these currencies beyond their notional 2.25 per cent margins. 1/

During a review of the EMS conducted in September 1979, it was decided not to modify the functioning of the divergence indicator. It would have been possible to increase the likelihood of the indicator signaling a currency as being divergent before it would reach its bilateral intervention limits by lowering the divergence threshold significantly, i.e., from 75 to 50 per cent. However, this would have meant that the indicator's warning bell would ring quite frequently--often without justification--causing the authorities to pay less attention to it.

c. Settlement of intervention debts

According to the Central Bank Agreement, the time for the settlement of claims and debts from obligatory intervention in participating currencies of debts under the very short-term financing is 45 days after the end of the month in which intervention took place. This can be extended automatically by three months, subject to certain limitations, and by another three months, subject to the agreement of the creditor central bank. Settlement is to be effected:

- in the first place by using holdings in the creditor currencies;
- subsequently in part or wholly in ECUs, with the provision that a creditor central bank is not obliged to accept settlement in ECUs of an amount exceeding 50 per cent of its claim;
- for the remaining balance in other reserve assets in accordance with the composition of the debtor central bank's reserves, excluding gold.

The Agreement, however, explicitly leaves room for other forms of settlement as agreed between creditor and debtor central banks.

In practice, various methods have been used to settle claims and debts arising from intervention. The very short-term financing facility, which applies only to obligatory intervention, has not been used extensively, and the formal settlement procedures as outlined above have been applied only to a relatively small part of intervention debts. In large part, debts and claims resulting from obligatory intervention have been offset against each other; a smaller part has been settled by the debtor central bank buying the currency of the creditor and exchanging it for its own currency. The latter method has the advantage of influencing

1/ For details see: IMF Survey, March 19, 1979, Supplement, p. 98. For further literature on the functioning of the divergence indicator, see bibliography, in particular, J. Salop and J. J. Rey.

the money supply of the creditor country only temporarily, and was frequently facilitated by extending the settlement date automatically or by mutual agreement.

A substantial part of intervention in currencies of participating central banks was intra-marginal, and largely financed by using holdings of the intervention currency which had been acquired earlier in the markets or resulted from borrowing abroad. Another part was financed by spot settlement in dollars or ECUs.

d. Role of the ECU

At the start of the EMS, each central bank participating in the exchange rate mechanism, was to contribute 20 per cent of its gold holdings and 20 per cent of its gross reserves in dollars to the EMCF. Against these contributions, the EMCF issued a corresponding amount of ECUs. These transactions took the form of revolving three-month swaps. For the purpose of these transactions, dollars are valued at the market rate, and gold at the average market price of the six previous months or of the two fixings on the penultimate working day, whichever is lower. Every three months, the necessary adjustments are made to ensure that contributions continue to represent at least 20 per cent of the gold and dollar reserves of the participating central banks, and to bring the amount of issued ECUs in line with changed valuations.

At the beginning of the EMS, ECU 23 billion were created. When, in July 1979, the United Kingdom decided to voluntarily contribute 20 per cent of its gold and dollar reserves, the amount increased to ECU 27 billion. Subsequently, the amount of ECUs issued by the EMCF rose to nearly 50 billion in April 1981, but later fell to ECU 38 billion in July 1982. It increased again to ECU 42 billion in December 1982 (Table 27). Since July 1979, the quantity of gold contributed has remained virtually unchanged, while, since October 1979, the amount of dollars has fallen. The valuation of dollars experienced fluctuations according to developments in exchange markets, keeping the ECU equivalent of dollar contributions on balance unchanged. The key to the growth of ECUs was the rise in the price of gold. As the proportion of gold and dollars in the reserves (and hence in the contributions) of EMS central banks differ significantly, the distribution of ECUs among them is strongly affected by changes in the valuation of these two assets.

In sum, under the present provisions, the creation and distribution of ECUs is, apart from changes in international reserves of EMS member countries, determined by three variables which are outside the control of the system: the price of gold, the exchange rate of the dollar and the respective proportions of these two assets. "Under these circumstances, the quantity of ECUs created cannot be expected necessarily to

be consistent with the aims of the system." ^{1/} Various proposals to stabilize the amount of ECUs created have been presented but are at this time not under active consideration.

The actual use of ECUs has been limited. In December 1981, the positive or negative net positions of central banks in ECUs (i.e., amounts above or below those received from the EMCF) reached less than 8 per cent of the amount of ECUs created through the swap arrangements; this percentage rose in the first half of 1982, before declining to around 7 per cent in August 1982. A number of reasons may account for this development. Debtor central banks may have been reluctant to use ECUs, because the transitional character of the EMS could eventually require them to clear negative ECU positions by acquiring ECUs from other participants. On the other hand, creditor central banks may have discouraged the use of the ECU in view of its limited attractiveness, largely due to the lack of convertibility and the constraints on usability even within the system.

e. Credit facilities

The very short-term financing facility has already been discussed. While this facility is limited to participants in the exchange rate mechanism, other EC credit facilities are open to all member countries, and their establishment preceded the coming into existence of the EMS. The short-term monetary support (STMS) is designed to provide finance for a temporary balance of payments deficit on the request of a debtor central bank within the limits of its debtor quota; credits beyond these amounts are discretionary. The granting of medium-term financial assistance (MTFA) in case of balance of payments difficulties is subject to a decision by the Council of Ministers which lays down economic policy conditions.

Another mechanism in case of balance of payments difficulties, the Community loan facility, is also of a medium-term nature and was established in 1975 in connection with the first round of oil price increases. Under this facility, the Community can borrow in the market or from other sources and on-lend to member countries up to ECU 6 billion. ^{2/} As under the MTFA, credits are subject to a Council decision and linked to economic policy conditions.

The usability of the STMS and MTFA, which are schemes of mutual assistance, depends on the strength of the balance of payments and reserve position of the EC as a whole. The Community loan facility, with its reliance on outside sources of finance, not only supplements but to a certain degree also substitutes for the other credit facilities, in particular the MTFA. Apart from the very short-term financing, none

^{1/} European Economy, No. 12, July 1982, p. 44.

^{2/} On December 30, 1982, equivalent to SDR 5.25 billion.

of the credit facilities has been used since the start of the EMS. This may be explained by the relatively large reserves which at least some of the EMS countries have at their disposal. The easy access of EC countries to international markets may have made recourse to conditional credit facilities of the EC (or of the Fund for that matter) less attractive, while the good credit rating of EC countries on the market may have been enhanced by the very existence of large credit facilities within the EC.

2. Proposals for institutional changes

In the European Council's Resolution of December 1978 which laid down the framework for the "initial phase" of the EMS, the intention stated was "to consolidate, not later than two years after the start of the scheme, into a final system the provisions and procedures" of the initial phase. In this second phase the EMS would "entail the creation of the European Monetary Fund, [which would replace the European Monetary Cooperation Fund] as well as the full utilization of the ECU as a reserve asset and a means of settlement." The existing credit facilities were to be consolidated into a single fund.

Work on the next phase began soon after the start of the EMS in the Committee of Central Bank Governors and the Monetary Committee. The discussions concentrated on the following problems:

- The place and development of the ECU in the EMS. Of particular interest were the problems relating to a permanent transfer to the European Monetary Fund (EMF) of a certain portion of member countries' reserves against ECUs (compared with the provisional transfer on the basis of revolving swap arrangements as practiced at present); and to the role of the ECU as a means of settlement and its attractiveness as a reserve asset with emphasis on such questions as full usability within the system and convertibility into other reserve assets.
- The credit mechanisms and their consolidation in the EMF. A special issue was the fact that the various credit facilities (VSTF, STMS, and MTFA) are subject to different procedures governing their use. They have different maturities and objectives, and may or may not involve conditionality. Credits are to be granted under the responsibility of different institutions, the central banks in the case of VSTF and STMS, and the Council of Ministers in the case of the MTFA.
- The role and structure of the EMF. The main questions were whether and to what degree the EMF should be autonomous from governments, and how its decision-making bodies would be composed; and what tasks and powers in the field of foreign exchange market intervention, granting of credits, and the creation of liquidity it should get.

Due in part to the worsening of the economic climate in the EC countries and the world at large but mainly because of significant differences of opinion as to how these questions should be approached, the aim of limiting the initial, transitional phase to two years could not be observed. It became obvious that the economic, political and legal problems would be formidable, going in scope far beyond technical considerations. Subsequently, a more gradual approach emerged, and, in early 1982, the EC Commission submitted to the Council of Ministers a set of proposals. ^{1/} They were intended to further the step-by-step development of the EMS in certain key areas without waiting for a final, fully developed system, and dealt with the following problems:

- method of issue of ECUs, with the aim of limiting the volatility in the amount of created ECUs;
- abolition of the acceptance limit (now 50 per cent) for the use of ECUs in intra-EMS settlement of intervention debts;
- increased private use of ECUs;
- automaticity for financing of intramarginal intervention (i.e., in EMS currencies);
- measures to advance convergence, mainly by way of consultation and recommendation; and
- coordination of attitude toward third currencies, in particular the U.S. dollar.

By their very nature, these proposals concentrated on certain operational and technical aspects which can more easily be formalized but nevertheless might have important policy implications (e.g., acceptance limit for ECUs, financing of intramarginal intervention), whereas they were less specific in other areas such as the promotion of convergence in economic performance or the coordination of attitude toward third currencies. After thorough discussions in the competent bodies of the EC, no agreement on the package of proposals could be reached. Some member countries who favored the proposals concentrated on their operational aspects and emphasized that their implementation would help to consolidate and strengthen the system by enhancing its predictability. Other member countries opposed the proposals on the grounds that their acceptance would have adverse implications for the conduct of domestic monetary policy. They stressed the need to keep the system flexible; as long as there was no sufficient degree of convergence of economic performance, any attempt to make the features of the system more stringent would only weaken and ultimately endanger the system. There was general agreement that one of the prime tasks for the countries participating in the EMS was the pursuit of policies conducive to more convergence of economic developments.

^{1/} For the full text of the proposals, see: European Economy, July 1982, Annex D.

IV. The EMS and the IMF

1. The EMS and the functions of the Fund

In its December 1978 Resolution, the European Council stated: "The EMS is and will remain fully compatible with the relevant articles of the IMF Agreement." At the time of the establishment of the EMS, however, a number of questions were raised as to whether the operations of the EMS might impede the Fund in carrying out its functions in accordance with the Articles of Agreement. Questions were asked as to whether the Fund's and the EMS' approaches to the same problems might differ and whether conflicts might arise. These doubts concentrated on three areas: surveillance over exchange rate policies, conditionality in credit operations, and the creation of international liquidity.

While it may be too early to come to a final assessment, the experience of the past 3 1/2 years with EMS operations allows some observations and conclusions. At the outset, it may be said that any clear incompatibility of goals or of general policy orientation would have been surprising, taking into account that in the economic field the objectives of the Fund as laid down in the Articles and of the European Community as established in the EEC Treaty are often identical and certainly consistent. It should be noted, however, that while the Fund's final objectives are of an economic nature, the EC, and with it the EMS, has ultimately a political purpose. The creation of the European Economic Community aspired "to lay foundations of an even closer union among the peoples of Europe" (Preamble of the EEC Treaty). The EMS, in particular, is intended to prepare the ground for an eventual economic and monetary union by providing a high degree of exchange rate stability and a convergence of economic performance. While it is widely acknowledged that, during the first years of its existence, the EMS fell substantially short of some of its objectives, its ultimately political goals need to be kept in mind in judging policies and developments within the EMS.

a. Surveillance over exchange rate policies

As described above, there have been six realignments of exchange rates in the EMS since its inception. While, in the beginning, exchange rate changes were apparently made without major controversy and on the whole in a smooth and timely fashion, the last two realignments (in February and June 1982) led to discussions as to the direction and the size of adjustments "which became intense and at times difficult before unanimous consensus could be reached on a balanced rearrangement of the parity grid." ^{1/} It should be recalled in this connection that exchange rate changes in the EMS are a matter of common decision-making

^{1/} European Economy, No. 12, July 1982, p. 36.

and require unanimity among EMS participants. This requirement is not surprising when one considers the importance of such decisions for the functioning of the EMS and for the achievement of its twin objectives, external and internal stability, and also bearing in mind other aspects of common EC policies.

The Fund is not formally a partner in this decision-making process, and the formal obligations of EMS countries, in keeping with the bilateral nature of Fund/member relations, have been fully met by notifying the Fund promptly of any changes. It is obvious that the Fund and the EMS have a similarly strong interest in the effectiveness of exchange rates in facilitating international transactions and of securing international balance. There can always be differences in judgment regarding the timing of a decision, the magnitude of the exchange rate adjustment, and the appropriate mix of external and domestic measures. Such differences could arise either or both from different weights placed on economic or other considerations and from different assessments of the impact of alternative policy adjustments. Similar differences, and for similar reasons, also arise in the context of the exercise of Fund surveillance over the exchange rate policies of non-EMS member countries. In recent years, a number of European countries have tended to take an approach which tries to take into account sociopolitical processes, and they may at times put more emphasis on the exchange rate as an instrument to influence present and future economic developments. The "hard currency" option is a case in point. The EMS also needs to take into account other elements of common EC policies. It must look at adjustment policies also in the light of the quest for convergence as a way toward economic and monetary union.

Decisions on exchange rates are taken by national governments and the Fund's responsibility is to ensure that decisions taken (or not taken) are appropriate given the interest of the international community. If there were serious doubts about the appropriateness of a particular decision, then the Fund would have a right and duty to question it. This could be done on a country-by-country basis in the framework of Article IV Consultations and possible supplemental consultations, or in a multilateral context as envisaged in the Board discussion on March 17, 1982 on surveillance over exchange rate policies (EBM/82/32).

b. Conditionality in credit operations

The question at issue is the desirability, indeed the need, to synchronize conditions in simultaneous or sequential borrowing operations by an EC country ^{1/} from the Fund and under the various EC credit facilities. While in a strict sense this need would only refer to the use

^{1/} As mentioned earlier, the STMS and the MTFA, as well as the Community loan facility, can be used not only by those countries who actively participate in the EMS but also by the other EC member countries, i.e., the United Kingdom and Greece.

of the EC medium-term facilities (MTFA, Community loan facility), use of the unconditional short-term monetary support scheme (STMS) is also of interest since such short-term borrowing could later lead to consolidation under one of the medium-term facilities.

It can be assumed that any borrowing from the Fund or from an EC facility would have the same objective, namely to give a country time to bring its balance of payments back in order. Again, as for other countries, differences may arise as to the nature of the adjustment policies to be implemented, perhaps in this case reflecting constraints related to common EC policies. However, such differences would be consistent with the Fund's obligation to pay due regard to the social and political obligations, economic priorities, and circumstances of members, provided the measures taken are adequate.

The EC credit facilities (apart from the VSTF) have been used infrequently and not at all since the start of the EMS. Consequently, no distinct pattern for the decision-making process and the character of conditionality has developed within the EC. However, in connection with a change in the provisions governing the Community loan facility in March 1981, the procedures to be followed were more precisely defined. These procedures are very much in line with the Fund's policy as regards conditionality. Thus, the EC approach, called "graduation of conditionality", contains the elements of performance criteria, intermediate reviews, and the phasing of disbursements subject to compliance with the objectives of a stabilization program. Due to the limited number of its members and the special structure of its institutions, the decision-making process of the EC differs in character from the one in the Fund. Regarding the medium-term facilities, the Council of Ministers, representing all EC countries, will determine whether a loan will be granted, the amount of a loan, and the economic policy conditions. The decisions of the Council will be prepared by the EC Commission, and the EC Monetary Committee consisting of high government and central bank officials and representatives of the Commission. In this way, from the beginning all member governments as well as the Commission will be actively involved in designing and negotiating the framework for balance of payments assistance.

In its report on this subject of October 1980, ^{1/} the Monetary Committee also states that no a priori position should be taken as to whether a country in need of balance of payments assistance should first use the one or the other medium-term EC facility or should seek assistance from the Fund. Rather, the ranking of calls on the various sources of financing should depend on the circumstances at a given time.

^{1/} Published in the 22nd Report on the Activities of the Monetary Committee, Official Journal of the European Communities C124, Vol. 24, May 25, 1981.

c. Creation of international liquidity

When the EMS was being established, the question was raised whether any capacity of the EMS to create international liquidity on its own would not diminish the interest of EMS countries in the creation of international liquidity, conditional or unconditional, by the IMF. It should be pointed out, however, that any international liquidity created by the EMS would not be "global" but "regional" in character. Any excess creation of such liquidity by the EMS would, over time, inevitably undermine the payments situation of the EMS, very much as the creation of excess national liquidity will erode a currency's international strength.

The creation of ECUs against the contribution of 20 per cent of a country's gold and gross dollar reserves to the EMCF does not in itself constitute the creation of international liquidity. It only substitutes globally usable liquidity (dollars, gold) for liquidity which at present can only be used regionally and is subject to special restrictions.

While the creation of ECUs against gold does not create liquidity, it mobilizes reserves which otherwise may not have been used, and in this way may encourage less stringent policies. Because of the differences between the valuation of gold in the books of some EMS central banks and the market-related rates at which it is exchanged against ECUs, there is statistically an increase in international liquidity as shown in IFS, though this does not change the real liquidity position of a country. However, some of the central banks concerned employ procedures under which the domestic liquidity effect of such differences in gold valuation is sterilized.

The use of the credit facilities (VSTF, STMS, MFTA) does not necessarily create international liquidity. For a credit under the VSTF, the amount of the creditor central bank's currency in circulation increases, and a debtor position in the other currency is created. While the debtor position will disappear with settlement of the debt, the question whether the newly created amount of the creditor currency remains in circulation or will disappear depends on the means the debtor central bank will employ to meet its settlement obligations. If, under a credit facility like the STMS or MFTA, a credit was granted in EMS currencies, the effect would be similar to a transaction under the VSTF. If it was granted in foreign exchange (U.S. dollars) or in ECUs, there would only be a transfer of international liquidity from one central bank to another. A temporary creation of international liquidity could be imagined if the creditor central banks were to regard the claims they acquired as liquid, similar to a reserve tranche position in the Fund.

If, in the future, a European Monetary Fund were to be empowered to grant credits, the situation would not be greatly changed. The granting of credits by the EMF in ECUs would imply the replacement of national

liquidity sources by a community source. Presumably, the debtor central bank would convert ECUs with creditor central banks into national currencies or foreign exchange for intervention purposes, or use them outright for meeting settlement obligations. The effects in each case would be the same as in similar transactions described earlier, although with one important difference. Instead of claims on other central banks as at present, the creditor banks would receive newly issued ECUs which are indistinguishable from other ECU holdings. In this way there would be a temporary increase in international liquidity to the extent that actual use was made of loans from the EMF. In the longer-term, credit operations by the EMF could give rise to a varying but permanent outstanding amount of additional ECUs.

An altogether different situation would exist once the EMF is empowered to issue ECUs, not only against contributions in gold and dollars and in connection with credit operations, but also against national currencies or simply without any counterpart, similar to the allocation of SDRs. The ECUs thus created would be indistinguishable from others, and could be used in the same manner for settling intervention debts (or for any other international transaction which might be possible by then), and thus would contribute to an increase in international liquidity.

In this connection, it is interesting to examine whether the attitude of EMS countries on matters of monetary and liquidity policies have differed as they arose in the context of the IMF, the EMS or in a strictly national framework. A careful look at individual EC countries who participate in the EMS reveals that they attempt to adopt a consistent approach on monetary policy both in an international or national context. There are countries that follow a more conservative stability-oriented line of policy in domestic monetary policy, with regard to liquidity creation within the EMS as well as with regard to the size of quota increases or the creation of SDRs in the IMF. And there are others which have adopted a less conservative and more expansion-oriented policy stance regarding domestic and international monetary problems.

To sum up, the EMS does not at present permanently create international liquidity, except in a statistical sense. Schemes which could lead to the permanent creation of international liquidity, although only of a somewhat limited usability, will probably not be realized for some time to come. The present attitude of EMS countries with regard to monetary policy does not give reason to believe that they would adopt different standards for monetary policy depending on whether they arise in an IMF or EMS context.

2. Information about the EMS

From the beginning, there was great interest in the question of how the Fund can be kept informed about developments within the EMS. Obviously, the limited membership and the highly political nature of the

EC makes direct participation of the Fund in discussions regarding EMS matters unfeasible. Also, the Monetary Committee and the Committee of Central Bank Governors--the main EC bodies dealing with EMS matters--follow procedures which are distinctly different from those of the Fund in being more informal and requiring staff-prepared documents to a much lesser degree. On the other hand, publications of the Monetary Committee and the EC Commission contain from time to time interesting material on the EMS (see bibliography) but these often are available only with a substantial time lag. Therefore, ways have had to be found which would protect the confidentiality the EC understandably wants to maintain, but would, nevertheless, provide the information the Fund legitimately seeks to meet its obligations on exchange rate matters vis-à-vis all member countries.

In the second discussion of the EMS by the Executive Board on March 16, 1979 (EBM/79/45), the Executive Director for France, speaking on behalf of the Directors from EC countries made the following remarks:

As to relations with the EMS, it [is] the view of all EMS members that the requirements of the EMS would be fully compatible with the commitments they had undertaken as members of the Fund. There [exist] three levels for cooperation and exchange of information: first, management and Executive Directors for EC countries [are] in regular contact; second, the staff [maintains] appropriately close relations with national authorities of EC countries as well as with the Commission of the European Communities; and third, the Managing Director [is] maintaining adequate contacts with the Ministers of the countries involved.

In his summing-up of the same meeting, the Managing Director stated:

It is clear that the monetary activities of the EMS fall within the Board's responsibilities. Among other aspects are policies affecting exchange rates within Europe and with third currencies, fundamental economic policies, the structure of reserve assets, and policies on conditionality. The Fund has to consult with countries on these matters and check that their different policies are compatible with its Articles and its general aims....

In the course of both the Article IV Consultations and the World Economic Outlook exercises, we shall have to test the appropriateness of the policies implemented within the EMS--just as we test all other policies of individual countries or of regional groupings of countries--specifically to see whether they are conducive to the better working of the adjustment process.

In practice, there have been numerous meetings between the Managing Director and Ministers, Central Bank Governors, and Executive Directors from EC countries in which problems of mutual interest including EMS matters have been discussed. Regular Article IV Consultations as well as supplementary informal consultations between national authorities and Fund staff provide opportunities to discuss policies and developments in the EMS context, and staff reports on consultations usually contain references to such discussions. Additionally, the staff (including members of the Fund's Office in Europe) has had regular contacts with national and EC Commission officials in connection with meetings such as the Interim Committee, the BIS or the OECD, and by way of special visits in Europe where EMS questions of particular interest to the Fund can be and have been discussed. These wide ranging contacts have enabled the management and staff to be adequately informed about relevant developments in the EMS and to be in a position to inform the Executive Board accordingly.

Table 1. EMS: Periods of Strain 1/ 2/

| No. | Period | Source of Strain | Signaled by | | Remedies Adopted |
|-----|----------------------|---|--|---------------------|---|
| | | | Df | PG | |
| 1 | May/June 1979 | D: Widening CA deficits and deficient capital inflow. B: continued lack of confidence. | DK: -75 | DM/BF | Intervention to support both BF and DK. B: discount rate up from 6 to 9 per cent. D: discount rate up from 8 to 9 9 per cent. |
| 2 | Aug./Sep. 1979 | D and B: Capital inflows induced by earlier increases in nominal interest rates dry out in both countries. | DK: -75 BF: -75 | DM/DK | Intervention to support both BF and DK. D: discount rate up from 9 to 11 per cent on Sept. 17 after which date intervention stops. B: discount rate up from 9 to 10 per cent. Realignment I: DM up, DK down relative to other EMS currencies. |
| 3 | Nov. 1979 | Uncertainty after parliamentary election in late October puts pressure on the DK. | DK: slightly negative few days before realignment | | Intervention in support of DK. Realignment II: DK devalued against all other EMS currencies. |
| 4 | Dec. 1979-March 1980 | D: Deficient capital inflow because of uncertainty about DK in view of two recent realignments, and because of increasing international nominal interest rates. B: deficient capital inflow to finance CA deficits. | | FF/BF (in March) | Intervention keeps DK in the middle of the band. Discount rate up from 11 to 13 per cent. B: intervention majority in EMS currencies to support BF. Discount rate up from 10 to 14 per cent. |
| 5 | Oct. 1980 | G: Weak CA position relative to U.S. and major EMS countries plus interest differential disfavoring DM denominated investments. | DM: -70 | FF/DM | Intervention in support of DM. F: loosening of credit market. G: slight tightening of credit market. |
| 6 | Feb. 1981 | G: As U.S. interest rates surge and uncertainty about G's strategic (Poland) and economic position increases, pressure on DM becomes heavy. | DM: -60's FF: touching + 75 occasionally in Jan. and Feb. | FF/BF and FF/DM | Intervention in \$ and FF to support DM. G: special Lombard rate introduced; substantial tightening of monetary policy. |
| 7 | March 1981 | BF and Lit exposed at bottom of band subsequent to DM firming. After devaluation of Lit, BF remains under heavy pressure. | BF: -75 Lit: -75 (briefly) | DM/BF and FF/BF | I: intervention followed by increase in discount rate from 16.5 to 19 per cent. Realignment III: devaluation of Lit. B: intervention followed by increase in the discount rate from 12 to 16 per cent. |
| 8 | May 1981 | Presidential election in France (5/10/81). | F: -75 (two weeks from 5.11.81) | DM/FF | F: intervention. Interest rate and exchange control measures. |
| 9 | Aug./Sept. 1981 | On the background of pessimism as to the devaluation of the FF, DM gains strength on improving external performance, and FF and BF have problems following DM up against dollar. | DM: +75 (last two weeks of Sept.). BF: not past -75 but most "diverging" of weak currencies | DM/BF | Intervention in support of weak EMS currencies. Realignment IV: DM and NG revalued and FF and Lit devalued against DK, BF, IP. |

Table 1 (Concluded). EMS: Periods of Strain 1/2/

| No. | Period | Source of Strain | Signaled by | | Remedies Adopted |
|-----|---------------|--|---|-----------------|--|
| | | | DI | PG | |
| 10 | Nov. 1981 | Brief pressure on BF when negotiations to form a government break down. | BF: once below -75 on Dec. 10 | | Intervention in support of BF. B: discount rate from 13 to 15 per cent. |
| 11 | Feb. 1982 | Diminishing confidence in the future performance of the Belgian economy. | BF: close to, but not past -75. DK: slightly negative | | B: intervention. Realignment V: devaluation of BF and DK against other EMS currencies. |
| 12 | March 1982 | F: widening inflation differential with G. DK and BF lose strength acquired in previous realignments. | F: one flash (-76) on March 23; otherwise well within bounds | DM/FF and DG/FF | F: intervention, tightening of monetary policy, exchange controls, budget tightening. |
| 13 | May/June 1982 | "The weekend syndrome": pressure on BF, FF, Lit, especially late in week. Persistent realignment rumors. | DM: above +75 from end-April. BF: most "diverging" currency at bottom | DM/BF | Intervention. Realignment VI: Revaluation of DM and NG and devaluation of Lit and FF against DK, BF, and IP. |

Source: Fund staff estimates and calculations.

1/ Defined as periods with reports of substantial interference in the exchange market by intervention, capital and exchange controls, or measures of monetary policy motivated by exchange rate developments.

2/ Notation: B - Belgium; BF - Belgian franc; D - Denmark; DK - Danish krone; F - France; FF - French franc; G - Germany; DM - deutsche mark; IP - Irish pound; I - Italy; Lit - Italian lira; N - Netherlands; NG - Netherlands guilder; DI - divergence indicator; PG - parity grid.

Table 2. EMS: Bilateral Central Rates ^{1/}

| Currency Units | 100 Belgian/ Lux. Francs | 100 Danish Kroner | 100 Deutsche Mark | 100 French Francs | 100 Italian Lire | 100 Irish Pounds | 100 Dutch Guilders |
|---------------------------------|-----------------------------|----------------------|----------------------|----------------------|---------------------|---------------------|-----------------------|
| Belgian/ Lux. francs | | | | | | | |
| 3.13.1979 | | 556.852 | 1,571.64 | 680.512 | 3.43668 | 5,954.71 | 1,450.26 |
| 9.24.1979 | | 540.942 | 1,603.07 | 680.512 | 3.43668 | 5,954.71 | 1,450.26 |
| 11.30.1979 | | 515.186 | 1,603.07 | 680.512 | 3.43668 | 5,954.71 | 1,450.26 |
| 3.23.1981 | | 515.186 | 1,603.07 | 680.512 | 3.23048 | 5,954.71 | 1,450.26 |
| 10.5.1981 | | 515.186 | 1,691.25 | 660.097 | 3.13355 | 5,954.71 | 1,530.03 |
| 2.22.1982 | | 546.154 | 1,848.37 | 721.415 | 3.42466 | 6,507.92 | 1,672.16 |
| 6.14.1982 | | 546.154 | 1,926.93 | 679.941 | 3.33047 | 6,507.92 | 1,743.23 |
| Danish kroner | | | | | | | |
| 3.13.1979 | 17.9581 | | 282.237 | 122.207 | 0.617161 | 1,069.35 | 260.439 |
| 9.24.1979 | 18.4862 | | 296.348 | 125.801 | 0.635312 | 1,100.81 | 268.098 |
| 11.30.1979 | 19.4105 | | 311.165 | 132.091 | 0.667078 | 1,155.84 | 281.503 |
| 3.23.1981 | 19.4105 | | 311.165 | 132.091 | 0.627052 | 1,155.84 | 281.503 |
| 10.5.1981 | 19.4105 | | 328.279 | 128.128 | 0.60824 | 1,155.84 | 296.986 |
| 2.22.1982 | 18.3098 | | 338.433 | 132.09 | 0.62705 | 1,191.59 | 306.171 |
| 6.14.1982 | 18.3098 | | 352.817 | 124.496 | 0.609804 | 1,191.59 | 319.183 |
| Deutsche mark | | | | | | | |
| 3.13.1979 | 6.36277 | 35.4313 | | 43.2995 | 0.218668 | 378.886 | 92.2767 |
| 9.24.1979 | 6.238 | 33.7441 | | 42.4505 | 0.21438 | 371.457 | 90.4673 |
| 11.30.1979 | 6.238 | 32.1373 | | 42.4505 | 0.21438 | 371.457 | 90.4673 |
| 3.23.1981 | 6.238 | 32.1373 | | 42.4505 | 0.201518 | 371.457 | 90.4673 |
| 10.5.1981 | 5.9128 | 30.4619 | | 39.0302 | 0.185281 | 352.09 | 90.4673 |
| 2.22.1982 | 5.41018 | 29.5479 | | 39.0302 | 0.185281 | 352.090 | 90.4673 |
| 6.14.1982 | 5.18961 | 28.3433 | | 35.2863 | 0.172839 | 337.736 | 90.4673 |
| French francs | | | | | | | |
| 3.13.1979 | 14.6948 | 81.8286 | 230.95 | | 0.505013 | 875.034 | 213.113 |
| 9.24.1979 | 14.6948 | 79.4905 | 235.568 | | 0.505013 | 875.034 | 213.113 |
| 10.30.1979 | 14.6948 | 75.7054 | 235.568 | | 0.505013 | 875.034 | 213.113 |
| 3.23.1981 | 14.6948 | 75.7054 | 235.568 | | 0.474714 | 875.034 | 213.113 |
| 10.5.1981 | 15.1493 | 78.047 | 256.212 | | 0.474714 | 902.098 | 231.789 |
| 2.22.1982 | 13.8616 | 75.706 | 256.212 | | 0.474714 | 902.098 | 231.789 |
| 6.14.1982 | 14.7072 | 80.3239 | 283.396 | | 0.489818 | 957.129 | 256.38 |
| Italian lire | | | | | | | |
| 3.13.1979 | 2,909.79 | 16,303.3 | 45,731.4 | 19,801.5 | | 173,270.0 | 42,199.5 |
| 9.24.1979 | 2,909.79 | 15,740.3 | 46,646.0 | 19,801.5 | | 173,270.0 | 42,199.5 |
| 11.30.1979 | 2,909.79 | 14,990.7 | 46,646.0 | 19,801.5 | | 173,270.0 | 42,199.5 |
| 3.23.1981 | 3,095.51 | 15,947.6 | 49,623.2 | 21,065.3 | | 184,329.0 | 44,893.0 |
| 10.5.1981 | 3,191.26 | 16,440.9 | 53,972.2 | 21,065.3 | | 190,031.0 | 48,827.2 |
| 2.22.1982 | 2,920.0 | 15,947.70 | 53,972.2 | 21,065.3 | | 190,031.0 | 48,827.2 |
| 6.14.1982 | 3,002.58 | 16,398.7 | 57,857.4 | 20,415.7 | | 195,405.0 | 52,341.9 |
| Irish pounds | | | | | | | |
| 3.13.1979 | 1.67934 | 9.35146 | 26.3932 | 11.4281 | 0.0577136 | | 24.3548 |
| 9.24.1979 | 1.67934 | 9.08426 | 26.921 | 11.4281 | 0.0577136 | | 24.3548 |
| 11.30.1979 | 1.67934 | 8.65169 | 26.921 | 11.4281 | 0.0577136 | | 24.3548 |
| 3.23.1981 | 1.67934 | 8.65169 | 26.921 | 11.4281 | 0.0542508 | | 24.3548 |
| 10.5.1981 | 1.67934 | 8.65169 | 28.4018 | 11.0853 | 0.052623 | | 25.6944 |
| 2.22.1982 | 1.53659 | 8.39216 | 28.4018 | 11.0853 | 0.052623 | | 25.6944 |
| 6.14.1982 | 1.53659 | 8.39216 | 29.6090 | 10.4479 | 0.0511758 | | 26.7864 |
| Dutch guilders | | | | | | | |
| 3.13.1979 | 6.89531 | 38.3967 | 108.37 | 46.9235 | 0.23697 | 410.597 | |
| 9.24.1979 | 6.89531 | 37.2998 | 110.537 | 46.9235 | 0.23697 | 410.597 | |
| 11.30.1979 | 6.89531 | 35.5237 | 110.537 | 46.9235 | 0.23697 | 410.597 | |
| 3.23.1981 | 6.89531 | 35.5237 | 110.537 | 46.9235 | 0.222752 | 410.597 | |
| 10.5.1981 | 6.53583 | 33.6716 | 110.537 | 43.1428 | 0.204804 | 389.19 | |
| 2.22.1982 | 5.98027 | 32.6615 | 110.537 | 43.1428 | 0.204804 | 389.190 | |
| 6.14.1982 | 5.73646 | 31.3300 | 110.537 | 39.0045 | 0.191051 | 373.324 | |

Sources: European Commission; and Fund staff calculations.

^{1/} Expressed as the price of 100 units of the currency on top of the column in the currency in front of the row.

Table 3. EMS Realignment: Percentage Changes in Bilateral Central Rates 1/

| | 9.24.79 | 11.30.79 | 3.23.81 | 10.5.81 | 2.22.82 | 6.14.82 |
|--------------------------|---------|----------|---------|---------|---------|---------|
| Belgian/Luxembourg franc | | | | | -8.5 | |
| Danish krone | -2.9 | -4.8 | | | -3.0 | |
| Deutsche mark | +2.0 | | | +5.5 | | +4.25 |
| French franc | | | | -3.0 | | -5.75 |
| Italian lira | | | -6.0 | -3.0 | | -2.75 |
| Irish pound | | | | | | |
| Netherlands guilder | | | | +5.5 | | +4.25 |

Sources: European Commission; and Fund staff calculations.

1/ Calculated as the percentage change against the group of currencies whose bilateral parities remained unchanged in the realignment.

Table 4. EMS: ECU Central Rates 1/

| | 3.13.79 | 9.24.79 | 11.30.79 | 3.23.81 | 10.5.81 | 2.22.82 | 6.14.82 |
|--|----------|----------|----------|----------|----------|----------|----------|
| Belgian/Luxembourg franc | | | | | | | |
| (1) Units of national currency per ECU | 39.4582 | 39.8456 | 39.7897 | 40.7985 | 40.7572 | 44.6963 | 44.9704 |
| (2) Percentage change from previous CR | | 0.98 | -0.14 | 2.54 | -0.10 | 9.66 | 9.61 |
| (3) Percentage change from initial CR | | 0.98 | 0.84 | 3.40 | 3.29 | 13.28 | 13.97 |
| Danish krone | | | | | | | |
| (1) Units of national currency per ECU | 7.08592 | 7.36594 | 7.72336 | 7.91917 | 7.91117 | 8.18382 | 8.2340 |
| (2) Percentage change from previous CR | | 3.95 | 4.85 | 2.54 | -0.10 | 3.45 | 0.61 |
| (3) Percentage change from initial CR | | 3.95 | 9.00 | 11.76 | 11.65 | 15.49 | 16.20 |
| Deutsche mark | | | | | | | |
| (1) Units of national currency per ECU | 2.51064 | 2.48557 | 2.48208 | 2.54502 | 2.40989 | 2.41815 | 2.33379 |
| (2) Percentage change from previous CR | | -1.00 | -0.1 | 2.54 | -5.31 | 0.34 | -3.48 |
| (3) Percentage change from initial CR | | -1.00 | -0.1 | 1.37 | -4.01 | -3.68 | -7.04 |
| French franc | | | | | | | |
| (1) Units of national currency per ECU | 5.79831 | 5.85522 | 5.84700 | 5.99526 | 6.17443 | 6.19564 | 6.61387 |
| (2) Percentage change from previous CR | | 0.98 | -0.14 | 2.54 | 2.99 | 0.34 | 6.75 |
| (3) Percentage change from initial CR | | 0.98 | 0.84 | 3.40 | 6.49 | 6.85 | 14.07 |
| Italian lira | | | | | | | |
| (1) Units of national currency per ECU | 1,148.15 | 1,159.42 | 1,157.79 | 1,262.92 | 1,300.67 | 1,305.13 | 1,350.27 |
| (2) Percentage change from previous CR | | 0.98 | -0.14 | 9.1 | 2.99 | 0.34 | 3.46 |
| (3) Percentage change from initial CR | | 0.98 | 0.84 | 10.00 | 13.28 | 13.67 | 17.60 |
| Irish pound | | | | | | | |
| (1) Units of national currency per ECU | 0.662638 | 0.669141 | 0.668201 | 0.685145 | 0.684452 | 0.686799 | 0.691011 |
| (2) Percentage change from previous CR | | 0.98 | -0.14 | 2.54 | -0.10 | 0.34 | 0.61 |
| (3) Percentage change from initial CR | | 0.98 | 0.84 | 3.40 | 3.29 | 3.65 | 4.28 |
| Netherlands guilder | | | | | | | |
| (1) Units of national currency per ECU | 2.72077 | 2.74748 | 2.74362 | 2.81318 | 2.66382 | 2.67296 | 2.57971 |
| (2) Percentage change from previous CR | | 0.98 | -0.14 | 2.54 | -5.31 | 0.34 | -3.49 |
| (3) Percentage change from initial CR | | 0.98 | 0.84 | 3.40 | -2.09 | -1.76 | -5.18 |

Source: European Commission.

1/ The change of any central rate expressed in terms of ECU implies a simultaneous change of all other ECU central rates, since the ECU is made up of a basket of currencies. Positive sign indicates depreciation relative to the ECU.

Table 5. EMS: Interest Differentials for Three-month Deposits (End-Month)

| | | Belgium ^{3/} | | France | | Germany | | Italy | | Netherlands | |
|------|---|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| | | Uncovered ^{1/} | Covered ^{1/2/} | Uncovered ^{1/} | Covered ^{1/2/} | Uncovered ^{1/} | Covered ^{1/2/} | Uncovered ^{1/} | Covered ^{1/2/} | Uncovered ^{1/} | Covered ^{1/2/} |
| 1979 | M | 2.83 | -0.50 | 3.56 | 0.87 | 5.33 | -0.53 | -1.06 | -0.24 | 3.50 | -0.29 |
| | A | 2.51 | -0.48 | 3.88 | 1.21 | 5.23 | -0.72 | -0.68 | 0.31 | 3.44 | -0.02 |
| | M | 1.79 | 0.62 | 2.07 | 3.03 | 4.54 | -0.28 | -0.62 | 1.98 | 1.69 | 0.06 |
| | J | 0.88 | 0.79 | 1.38 | 2.06 | 4.08 | -0.28 | -0.81 | 1.99 | 2.25 | -0.05 |
| | J | -0.62 | 0.02 | 0.76 | 1.67 | 4.53 | -0.53 | -0.18 | 4.56 | 1.88 | -0.30 |
| | A | -0.19 | -0.04 | 0.81 | 1.25 | 4.79 | -0.12 | 0.63 | 3.15 | 2.63 | -0.27 |
| | S | -0.03 | 0.53 | 1.12 | 1.85 | 4.80 | -0.65 | 1.19 | 3.70 | 2.94 | -0.40 |
| | O | 1.28 | -0.18 | 2.88 | 1.50 | 5.88 | -0.95 | 2.26 | 3.89 | 5.00 | -0.75 |
| | N | -0.35 | -0.17 | 1.62 | 1.39 | 4.35 | -1.08 | 0.50 | 2.66 | -0.50 | -1.12 |
| | D | 0.43 | -0.01 | 2.31 | 1.81 | 5.01 | -1.08 | -2.69 | 1.21 | 1.56 | -0.66 |
| 1980 | J | -0.13 | -0.37 | 2.13 | 0.48 | 5.53 | -0.65 | -3.31 | 3.03 | 3.07 | -0.11 |
| | F | 1.63 | 0.08 | 3.25 | 0.55 | 7.90 | -0.14 | -1.00 | 1.49 | 4.12 | 1.49 |
| | M | 2.00 | 0.27 | 6.00 | 0.02 | 9.90 | -0.70 | 1.63 | -0.16 | 8.56 | -0.16 |
| | A | -2.00 | -1.10 | 1.38 | 0.03 | 4.08 | -0.79 | -1.93 | 0.04 | 4.57 | 0.16 |
| | M | -6.13 | -0.75 | -1.93 | 0.56 | 0.39 | -0.23 | -6.62 | 1.22 | -0.62 | 0.35 |
| | J | -5.19 | -0.61 | -2.44 | 0.15 | -0.14 | -0.47 | -7.63 | 9.23 | -0.69 | 0.09 |
| | J | -2.44 | -0.12 | -1.56 | 0.37 | 0.69 | -0.84 | -7.56 | 5.39 | 0.57 | 0.08 |
| | A | -0.79 | ... | 0.75 | 0.71 | 3.30 | -0.60 | -5.06 | 10.11 | 1.63 | 0.07 |
| | S | 1.46 | -0.08 | 1.69 | 0.19 | 4.91 | -0.03 | -4.57 | 5.57 | 3.94 | 0.07 |
| | O | 2.49 | -0.22 | 3.38 | -0.35 | 6.18 | -0.45 | -2.37 | 2.95 | 6.13 | 0.01 |
| 1981 | N | 4.81 | -0.19 | 6.63 | -0.40 | 8.30 | -0.48 | 0.38 | 0.82 | 8.06 | -0.26 |
| | D | 4.34 | -0.71 | 6.32 | -0.20 | 7.62 | -1.54 | 0.32 | 1.06 | 8.57 | -0.45 |
| | J | 6.09 | -0.88 | 6.38 | -0.41 | 8.03 | -0.31 | 0.01 | 1.29 | 8.19 | -0.27 |
| | F | 3.56 | 0.35 | 2.81 | 0.05 | 2.05 | -0.27 | -0.88 | 0.88 | 5.38 | -0.04 |
| | M | -2.12 | 2.94 | 1.83 | 0.85 | 1.31 | -0.94 | -3.38 | 1.40 | 4.63 | -0.04 |
| | A | -0.12 | 1.30 | 3.26 | 0.28 | 3.82 | -0.70 | -2.94 | -0.62 | 6.00 | 0.43 |
| | M | 2.46 | 1.63 | -0.44 | 2.36 | 4.28 | -1.07 | -2.44 | 1.97 | 5.37 | -0.45 |
| | J | 3.25 | 0.61 | -0.12 | 4.84 | 4.72 | -0.91 | -2.87 | 3.48 | 6.01 | -0.37 |
| | J | 2.19 | 5.46 | 1.51 | 4.38 | 5.66 | -1.02 | -2.13 | 7.68 | 5.38 | -0.71 |
| | A | 2.82 | 5.84 | 0.70 | 10.15 | 5.36 | -0.76 | -2.94 | 10.64 | 4.56 | ... |
| 1982 | S | 1.69 | 7.36 | -0.88 | 8.60 | 5.46 | -0.53 | -3.37 | 11.52 | 5.01 | -0.10 |
| | O | 0.71 | 4.69 | 0.25 | 2.02 | 3.95 | -0.52 | -5.41 | 0.89 | 2.97 | -0.11 |
| | N | -2.50 | 1.75 | -3.91 | 0.41 | 1.16 | -0.48 | -9.32 | -0.49 | 0.94 | 0.12 |
| | D | -1.94 | 3.86 | -1.28 | 1.69 | 2.93 | -0.38 | -7.50 | 1.50 | 2.94 | -0.03 |
| | J | 0.63 | 4.90 | -0.90 | 0.11 | 4.12 | -0.38 | -6.94 | 0.16 | 4.50 | -0.14 |
| | F | 0.63 | 0.65 | 0.87 | 1.72 | 4.67 | -0.63 | -5.82 | 0.09 | 5.44 | -0.14 |
| | M | 0.75 | 2.36 | -0.78 | 8.85 | 5.71 | -0.93 | -5.31 | 5.00 | 7.07 | -0.51 |
| | A | -0.06 | 2.15 | -1.86 | 5.95 | 5.62 | -0.83 | -5.75 | 3.29 | 6.44 | -0.49 |
| | M | -0.31 | 1.54 | -1.85 | 9.07 | 5.19 | -1.01 | -6.25 | 2.67 | 5.75 | -0.41 |
| | J | 0.63 | 0.88 | 0.73 | 2.01 | 6.36 | -0.89 | -4.56 | 1.18 | 6.88 | -0.53 |
| 1982 | J | -1.62 | -0.41 | -1.95 | 1.18 | 3.57 | -0.91 | -6.87 | -0.08 | 4.07 | -0.13 |
| | A | -3.34 | -0.29 | -2.75 | 7.44 | 3.07 | -0.39 | -7.31 | 1.81 | 3.63 | 0.08 |
| | S | -1.37 | 0.26 | -2.57 | 3.88 | 3.29 | -0.61 | -7.13 | 0.22 | 3.56 | -0.23 |
| | O | -2.60 | 0.14 | -3.12 | 6.01 | 2.61 | -0.42 | -8.82 | 1.25 | 3.44 | -0.05 |

Source: IMF, "Foreign Exchange and Financial Markets", monthly reports.

^{1/} Positive sign indicates differential in favor of Eurodollar investment relative to domestic investment, while negative sign indicates the reverse. Domestic interest rates for France, Germany, Italy and the Netherlands are interbank rates. For Belgium the rate on four-month certificates of the Government Securities Stabilization Fund is used.

^{2/} Covered interest differential is calculated as the uncovered interest differential minus the forward exchange quotation.

^{3/} Rates pertain to last Tuesday of the month.

Table 6. EMS: Economic Measures in Connection with Realignments

| Realignment Date | Realignment Wording in Official Communiqué | Measures in | | | |
|--------------------|--|---|---|--|---|
| | | Belgium | Denmark | France | Italy |
| September 24, 1979 | Shift in cross-rate between DM and DK of 5 per cent. Shift in cross-rate between DM and other EMS currencies of 2 per cent | -- | -- | -- | -- |
| November 30, 1979 | Devaluation of DK by 5 per cent against other EMS currencies (no communiqué) | -- | (1) Energy-component removed from wage-regulating index (2) Short-term price and wage freeze measures (3) Increases in direct personal wealth and corporate taxes | -- | -- |
| March 23, 1981 | Devaluation of Lit by 6 per cent against other EMS currencies | -- | -- | -- | (1) Discount rate up 2 1/2 per cent to 19 per cent (2) Government spending cut plans |
| October 5, 1981 | Revaluation of DM by 5.5 per cent against DK, BF, IP. Devaluation of FF, Lit by 3 per cent against DK, BF, IP | | | (1) Temporary price and profit freeze (2) Incomes policy aiming at maintenance of average income purchasing power, narrowing of income range (3) FF 10.15 billion government expenditure in suspense | |
| February 22, 1982 | Devaluation of BF by 8.5 per cent and of DK by 3 per cent against other EMS currencies | (1) Temporary freeze of wages and longer run measures to impede complete wage indexation (2) Temporary price freeze (3) Reduction in corporate tax burden (4) Measures to stimulate the stock market | -- | -- | -- |
| June 14, 1982 | Change in bilateral rates: between FF and DM, NG 10 per cent; between Lit and DM, NG 7 per cent; between DK, BF, IP and DM, NG 4.25 per cent | | | (1) Temporary freeze of wages, prices, rents and dividends (except min. wage) to be followed up by agreements on price and dividend behavior and indexation practices for wages (2) Revision of 1983 budget to restrict deficit to FF 120 billion (3 per cent of GNP) | (1) Announcement of budgetary austerity measures, June 23. |

Source: European Commission; and Fund staff.

Table 7. Variability of Nominal Effective Exchange Rates 1/ 2/

| | 1974 | 1975 | 1976 | 1977 | 1978 | Average 1974-78 | 1979 | 1980 | 1981 | Average 1979-81 | 1982 <u>3/</u> |
|---------------------------------------|------|------|------|------|------|--------------------|------|------|------|--------------------|----------------|
| Belgium | 21.7 | 23.2 | 27.6 | 9.4 | 15.4 | 19.5 | 9.3 | 14.5 | 14.5 | 12.8 | 38.9 |
| Denmark | 26.6 | 18.5 | 24.8 | 18.0 | 14.4 | 20.5 | 17.4 | 20.1 | 24.3 | 20.6 | 21.6 |
| France | 27.9 | 21.9 | 40.3 | 5.4 | 17.1 | 22.5 | 14.6 | 18.3 | 31.5 | 21.5 | 39.7 |
| Germany | 25.9 | 23.6 | 36.5 | 20.2 | 20.4 | 25.3 | 23.0 | 23.9 | 22.4 | 23.1 | 12.0 |
| Ireland | 10.9 | 39.6 | 63.3 | 15.8 | 19.7 | 29.9 | 12.4 | 22.9 | 23.4 | 19.6 | 9.7 |
| Italy | 31.5 | 5.4 | 63.4 | 14.7 | 20.1 | 27.0 | 8.6 | 28.9 | 39.5 | 25.7 | 12.3 |
| Netherlands | 23.1 | 19.5 | 33.5 | 8.1 | 16.8 | 20.2 | 11.0 | 13.1 | 26.0 | 16.7 | 8.9 |
| Average EMS <u>4/</u> | 23.9 | 18.9 | 41.3 | 13.1 | 17.7 | 23.0 | 13.8 | 20.2 | 25.9 | 20.0 | 20.4 |
| Austria | 33.6 | 21.4 | 31.8 | 17.2 | 14.2 | 23.6 | 32.9 | 22.5 | 23.9 | 26.4 | 6.1 |
| Canada | 6.9 | 15.1 | 16.2 | 9.4 | 39.5 | 17.4 | 14.3 | 7.2 | 17.3 | 12.9 | 14.0 |
| Japan | 31.2 | 10.0 | 21.6 | 53.7 | 85.5 | 40.4 | 70.9 | 70.3 | 21.4 | 54.2 | 30.8 |
| Norway | 20.0 | 25.6 | 26.6 | 21.5 | 23.1 | 23.4 | 8.8 | 7.4 | 10.3 | 8.8 | 29.7 |
| Sweden | 23.1 | 22.8 | 21.2 | 60.7 | 1.9 | 25.9 | 14.5 | 4.3 | 49.6 | 22.8 | 1.6 |
| Switzerland | 54.6 | 13.0 | 24.8 | 54.1 | 59.4 | 41.2 | 18.4 | 18.3 | 55.9 | 30.9 | 25.8 |
| United Kingdom | 11.0 | 41.8 | 71.6 | 12.7 | 26.1 | 32.6 | 40.2 | 30.1 | 58.3 | 42.9 | 6.6 |
| United States | 18.5 | 29.9 | 7.5 | 14.3 | 35.7 | 21.2 | 10.3 | 23.5 | 48.8 | 27.5 | 39.2 |
| Average non-EMS <u>4/</u> | 24.9 | 22.5 | 27.7 | 30.5 | 35.7 | 28.3 | 26.3 | 23.0 | 35.7 | 28.3 | 19.2 |
| Average European non-EMS <u>4/</u> | 28.5 | 24.9 | 35.2 | 33.2 | 24.9 | 29.3 | 23.0 | 16.5 | 39.6 | 26.4 | 14.0 |

Source: IMF, International Financial Statistics.

1/ Based on the Fund's multilateral exchange rate model, and monthly data.

2/ Variability is measured by the coefficient of variation (multiplied by 1,000) of monthly exchange rates.

3/ First nine months.

4/ Unweighted average.

Table 8. Variability of Nominal Exchange Rates Against EMS Currencies 1/

| | 1974 | 1975 | 1976 | 1977 | 1978 | Average 1974-78 | 1979 | 1980 | 1981 | Average 1979-81 | 1982 <u>2/</u> |
|---------------------------------------|------|------|------|------|------|--------------------|------|------|------|--------------------|----------------|
| Belgium | 21.3 | 17.8 | 34.5 | 12.2 | 15.8 | 20.3 | 8.1 | 6.2 | 17.0 | 10.4 | 37.8 |
| Denmark | 24.6 | 14.6 | 41.3 | 28.1 | 16.3 | 25.0 | 26.3 | 7.8 | 17.7 | 17.3 | 18.4 |
| France | 32.8 | 26.7 | 57.6 | 15.0 | 26.3 | 31.7 | 9.2 | 7.3 | 21.8 | 12.8 | 34.1 |
| Germany | 28.9 | 20.8 | 53.0 | 21.8 | 21.8 | 29.3 | 12.2 | 6.5 | 28.0 | 15.6 | 29.4 |
| Ireland | 26.5 | 33.4 | 73.2 | 16.6 | 30.1 | 36.0 | 12.1 | 6.9 | 15.5 | 11.5 | 22.0 |
| Italy | 41.8 | 18.7 | 70.3 | 20.4 | 28.7 | 36.0 | 14.1 | 11.5 | 27.9 | 17.8 | 18.6 |
| Netherlands | 21.8 | 15.0 | 39.4 | 13.2 | 16.0 | 21.1 | 9.3 | 7.5 | 22.8 | 13.2 | 22.9 |
| Average EMS <u>3/</u> | 2.2 | 21.0 | 52.8 | 18.2 | 22.1 | 28.5 | 13.0 | 7.7 | 21.5 | 14.1 | 26.2 |
| Austria | 26.5 | 12.4 | 34.8 | 13.6 | 14.0 | 20.3 | 16.9 | 6.1 | 21.0 | 14.7 | 17.0 |
| Canada | 30.3 | 42.6 | 45.4 | 42.1 | 60.4 | 44.2 | 28.0 | 30.0 | 66.5 | 41.5 | 38.1 |
| Japan | 41.9 | 31.7 | 39.3 | 40.3 | 69.4 | 44.5 | 78.9 | 88.2 | 32.8 | 66.6 | 19.9 |
| Norway | 20.3 | 16.1 | 34.1 | 28.1 | 28.1 | 25.3 | 12.4 | 24.4 | 26.7 | 21.1 | 27.9 |
| Sweden | 19.9 | 14.9 | 33.7 | 65.6 | 17.1 | 30.2 | 13.7 | 22.4 | 48.7 | 28.3 | 19.3 |
| Switzerland | 45.8 | 21.5 | 45.0 | 49.0 | 59.0 | 44.1 | 9.8 | 17.1 | 65.7 | 30.9 | 24.4 |
| United Kingdom | 24.0 | 30.0 | 67.2 | 14.6 | 27.4 | 32.6 | 35.3 | 52.3 | 44.6 | 44.1 | 21.3 |
| United States | 32.5 | 44.5 | 38.5 | 19.1 | 38.7 | 34.7 | 23.0 | 40.9 | 71.2 | 45.0 | 47.9 |
| Average non-EMS <u>3/</u> | 30.2 | 26.7 | 42.3 | 34.1 | 39.3 | 34.5 | 27.2 | 35.2 | 47.2 | 36.5 | 27.0 |
| Average European non-EMS <u>3/</u> | 27.3 | 19.0 | 43.0 | 34.2 | 29.1 | 30.5 | 17.6 | 24.5 | 41.3 | 27.8 | 22.0 |

Source: IMF, International Financial Statistics.

1/ Weighted average (MERM weights) of variability of bilateral nominal exchange rate against EMS currencies, with variability measured by coefficient of variation (multiplied by 1,000) of bilateral exchange rates.

2/ First nine months only.

3/ Unweighted average.

Table 9. Variability of Nominal Exchange Rates Against Non-EMS Currencies 1/

| | 1974 | 1975 | 1976 | 1977 | 1978 | Average 1974-78 | 1979 | 1980 | 1981 | Average 1979-81 | 1982 <u>2/</u> |
|---------------------------------------|------|------|------|------|------|--------------------|------|------|------|--------------------|----------------|
| Belgium | 36.6 | 40.8 | 29.4 | 31.1 | 45.7 | 36.7 | 33.8 | 43.9 | 53.1 | 43.6 | 52.3 |
| Denmark | 32.6 | 33.6 | 25.5 | 30.6 | 39.0 | 32.3 | 30.3 | 38.8 | 53.7 | 40.9 | 33.1 |
| France | 33.8 | 34.5 | 47.9 | 27.0 | 45.9 | 37.8 | 35.6 | 44.5 | 60.7 | 46.9 | 50.0 |
| Germany | 34.3 | 35.1 | 30.0 | 32.6 | 46.4 | 35.7 | 39.3 | 45.9 | 48.1 | 44.4 | 23.2 |
| Ireland | 18.1 | 47.5 | 61.4 | 25.7 | 32.3 | 37.0 | 29.1 | 43.4 | 65.0 | 45.8 | 27.5 |
| Italy | 24.8 | 28.7 | 70.6 | 26.3 | 39.9 | 38.1 | 32.0 | 53.9 | 57.8 | 47.9 | 28.5 |
| Netherlands | 35.3 | 38.9 | 35.4 | 28.8 | 45.7 | 36.8 | 32.5 | 40.6 | 57.6 | 43.6 | 24.1 |
| Average EMS <u>3/</u> | 30.8 | 37.0 | 42.9 | 28.9 | 42.1 | 36.3 | 33.2 | 44.4 | 56.6 | 44.7 | 34.1 |
| Austria | 44.0 | 38.0 | 33.4 | 35.2 | 46.9 | 39.5 | 49.9 | 45.5 | 51.5 | 49.0 | 24.9 |
| Canada | 12.9 | 16.7 | 17.0 | 34.1 | 36.1 | 23.4 | 18.3 | 18.3 | 17.0 | 17.9 | 23.3 |
| Japan | 33.3 | 22.1 | 22.1 | 59.5 | 96.7 | 46.7 | 68.3 | 64.7 | 48.5 | 60.5 | 45.5 |
| Norway | 30.5 | 40.2 | 30.7 | 34.4 | 42.4 | 35.6 | 29.9 | 30.0 | 42.9 | 34.3 | 40.2 |
| Sweden | 33.4 | 37.3 | 25.8 | 64.3 | 38.7 | 39.9 | 30.6 | 28.2 | 65.5 | 41.4 | 25.7 |
| Switzerland | 63.1 | 28.1 | 18.7 | 57.4 | 72.8 | 48.0 | 38.1 | 43.0 | 62.1 | 47.7 | 29.3 |
| United Kingdom | 25.7 | 56.4 | 82.5 | 34.4 | 48.8 | 49.6 | 54.0 | 34.4 | 79.8 | 56.1 | 26.0 |
| United States | 24.3 | 24.7 | 22.2 | 41.3 | 58.2 | 34.1 | 37.2 | 38.2 | 40.5 | 38.6 | 36.8 |
| Average non-EMS <u>3/</u> | 33.4 | 32.9 | 31.5 | 45.1 | 55.1 | 39.6 | 40.8 | 37.8 | 51.0 | 43.2 | 32.7 |
| Average European non-EMS <u>3/</u> | 39.3 | 40.0 | 38.2 | 45.1 | 49.9 | 42.5 | 40.5 | 36.2 | 60.4 | 45.7 | 31.2 |

Source: IMF, International Financial Statistics.

1/ Weighted average (MERM weights) of variability, measured by coefficient of variation of bilateral nominal exchange rates against the eight non-EMS countries listed.

2/ First nine months only.

3/ Unweighted average.

Table 10. Variability of Bilateral Real Exchange Rates Against EMS Currencies 1/

| | 1974 | 1975 | 1976 | 1977 | 1978 | Average 1974-78 | 1979 | 1980 | 1981 | Average 1979-81 | 1982 <u>2/</u> |
|---------------------------------------|------|------|------|------|------|--------------------|------|------|------|--------------------|----------------|
| Belgium | 31.8 | 19.3 | 31.4 | 8.5 | 19.0 | 22.0 | 17.2 | 14.0 | 10.7 | 14.0 | 37.6 |
| Denmark | 28.9 | 24.3 | 43.7 | 14.6 | 18.4 | 26.0 | 22.1 | 14.9 | 12.7 | 16.6 | 15.2 |
| France | 29.0 | 30.9 | 48.2 | 10.3 | 32.9 | 30.3 | 15.7 | 19.3 | 11.8 | 15.6 | 29.0 |
| Germany | 36.6 | 32.1 | 37.2 | 11.7 | 22.4 | 28.0 | 16.6 | 25.4 | 12.7 | 18.2 | 21.5 |
| Ireland | 25.4 | 29.3 | 46.1 | 11.8 | 25.4 | 27.6 | 22.1 | 16.8 | 15.6 | 18.2 | 11.2 |
| Italy | 24.8 | 25.0 | 48.5 | 11.0 | 21.4 | 26.1 | 22.8 | 23.8 | 12.3 | 19.6 | 17.0 |
| Netherlands | 22.6 | 19.9 | 35.7 | 11.3 | 16.3 | 21.2 | 19.2 | 14.7 | 15.3 | 16.4 | 16.1 |
| Average EMS <u>3/</u> | 28.4 | 25.8 | 41.5 | 11.3 | 22.3 | 25.9 | 19.4 | 18.4 | 13.0 | 16.9 | 21.1 |
| Austria | 24.7 | 18.9 | 29.4 | 8.5 | 15.7 | 19.4 | 14.3 | 15.1 | 10.2 | 13.2 | 12.7 |
| Canada | 32.2 | 50.3 | 38.6 | 38.7 | 57.3 | 43.4 | 32.4 | 32.9 | 68.0 | 44.4 | 34.1 |
| Japan | 31.1 | 34.3 | 35.2 | 34.8 | 66.2 | 40.3 | 85.1 | 83.3 | 26.4 | 64.9 | 25.2 |
| Norway | 21.0 | 19.3 | 29.7 | 27.2 | 26.4 | 24.7 | 20.7 | 31.7 | 24.7 | 25.7 | 25.2 |
| Sweden | 21.6 | 18.8 | 28.5 | 52.9 | 18.9 | 28.1 | 14.5 | 29.5 | 53.3 | 32.4 | 15.1 |
| Switzerland | 38.1 | 23.5 | 32.7 | 36.2 | 47.8 | 35.7 | 19.3 | 18.0 | 52.7 | 30.0 | 22.8 |
| United Kingdom | 22.7 | 23.1 | 54.5 | 16.0 | 24.3 | 28.1 | 56.6 | 60.6 | 43.4 | 53.5 | 15.7 |
| United States | 34.4 | 45.4 | 30.9 | 21.6 | 32.9 | 33.0 | 21.2 | 43.9 | 69.3 | 44.5 | 43.3 |
| Average non-EMS <u>3/</u> | 28.2 | 29.2 | 37.7 | 27.0 | 36.2 | 31.6 | 33.0 | 39.4 | 43.5 | 38.6 | 24.0 |
| Average European non-EMS <u>3/</u> | 25.6 | 20.6 | 39.3 | 24.1 | 26.6 | 27.2 | 25.1 | 31.0 | 36.9 | 31.0 | 18.3 |

Source: IMF, International Financial Statistics.

1/ A weighted average (MERM weights) of the variability of bilateral real exchange rates (as measured by nominal exchange rates adjusted for relative consumer price movements) against EMS countries, with variability measured by the coefficient of variation (multiplied by 1,000) of the bilateral real exchange rate.

2/ First nine months only.

3/ Unweighted average.

Table 11. Variability of Bilateral Real Exchange Rates Against Non-EMS Currencies 1/

| | 1974 | 1975 | 1976 | 1977 | 1978 | Average 1974-78 | 1979 | 1980 | 1981 | Average 1979-81 | 1982 2/ |
|--------------------------------|------|------|------|------|------|--------------------|------|------|------|--------------------|---------|
| Belgium | 42.8 | 35.7 | 31.1 | 27.9 | 40.8 | 35.7 | 36.6 | 50.6 | 56.5 | 47.9 | 48.5 |
| Denmark | 38.7 | 41.5 | 38.7 | 28.9 | 38.3 | 37.2 | 35.2 | 40.9 | 50.0 | 42.0 | 28.8 |
| France | 34.4 | 31.1 | 38.6 | 27.2 | 44.8 | 35.2 | 41.2 | 41.9 | 52.5 | 45.2 | 42.0 |
| Germany | 29.1 | 43.3 | 24.3 | 27.8 | 38.6 | 32.6 | 35.8 | 58.9 | 50.2 | 48.3 | 23.8 |
| Ireland | 25.3 | 49.3 | 36.7 | 25.6 | 29.6 | 33.3 | 29.6 | 44.5 | 52.4 | 42.2 | 18.7 |
| Italy | 26.4 | 24.0 | 49.4 | 26.4 | 36.0 | 32.5 | 48.6 | 38.1 | 51.1 | 45.9 | 26.3 |
| Netherlands | 30.6 | 36.6 | 38.4 | 25.4 | 39.8 | 34.2 | 35.1 | 48.9 | 61.4 | 48.5 | 25.5 |
| Average EMS 3/ | 32.5 | 37.4 | 36.7 | 27.0 | 38.3 | 34.4 | 37.4 | 46.3 | 53.4 | 45.7 | 30.5 |
| Austria | 35.0 | 42.7 | 30.4 | 29.6 | 39.2 | 35.4 | 43.3 | 56.5 | 55.2 | 51.7 | 26.0 |
| Canada | 13.9 | 14.9 | 17.2 | 26.5 | 36.5 | 21.8 | 22.7 | 18.3 | 22.1 | 21.0 | 20.0 |
| Japan | 30.6 | 21.4 | 28.1 | 52.6 | 84.9 | 43.5 | 84.6 | 57.0 | 59.7 | 67.1 | 51.9 |
| Norway | 23.2 | 36.6 | 28.5 | 30.3 | 39.3 | 31.6 | 36.9 | 29.8 | 52.4 | 39.4 | 31.6 |
| Sweden | 28.6 | 32.7 | 28.8 | 48.1 | 32.1 | 34.1 | 33.1 | 29.8 | 66.8 | 43.2 | 25.7 |
| Switzerland | 53.6 | 36.5 | 14.8 | 50.1 | 61.1 | 43.2 | 33.8 | 52.8 | 62.7 | 49.8 | 36.0 |
| United Kingdom | 30.0 | 30.5 | 62.6 | 33.3 | 43.0 | 40.0 | 77.2 | 36. | 69.8 | 61.3 | 26.2 |
| United States | 24.9 | 21.1 | 23.6 | 35.9 | 51.8 | 31.5 | 46.5 | 36.7 | 47.1 | 43.4 | 36.9 |
| Average non-EMS 3/ | 30.0 | 30.0 | 29.3 | 38.3 | 48.5 | 35.1 | 47.1 | 39.7 | 54.5 | 47.1 | 31.8 |
| Average European non-EMS 3/ | 34.1 | 35.8 | 33.0 | 38.3 | 42.9 | 36.8 | 44.7 | 42.5 | 60.3 | 49.1 | 29.1 |

Source: IMF, International Financial Statistics.

1/ Weighted average (MERM weights) of variability of bilateral real exchange rates against the above eight non-EMS countries as a group, with variability measured by the coefficient of variation (multiplied by 1,000) of the bilateral real exchange rate.

2/ First nine months only.

3/ Unweighted average.

Table 12. Consumer Price Index

(Annual change in per cent)

| | 1974 | 1975 | 1976 | 1977 | 1978 | Average 1974-78 | 1979 | 1980 | 1981 | Average 1979-81 | 1982 ^{2/} |
|---|------|------|------|------|------|--------------------|------|------|------|--------------------|--------------------|
| Belgium | 12.7 | 12.7 | 9.2 | 7.1 | 4.5 | 9.2 | 4.5 | 6.6 | 7.6 | 6.2 | 9.0 |
| Denmark | 15.2 | 9.6 | 9.0 | 11.1 | 10.0 | 11.0 | 9.6 | 12.3 | 11.7 | 11.2 | 10.0 |
| France | 13.7 | 11.8 | 9.6 | 9.4 | 9.1 | 10.7 | 10.8 | 13.3 | 13.3 | 12.5 | 11.8 |
| Germany | 6.9 | 6.0 | 4.3 | 3.7 | 2.7 | 4.7 | 4.1 | 5.5 | 5.9 | 5.2 | 5.4 |
| Ireland | 17.0 | 20.9 | 18.0 | 13.6 | 7.6 | 15.3 | 13.2 | 18.2 | 20.4 | 17.2 | 17.5 |
| Italy | 19.1 | 17.0 | 16.8 | 17.0 | 12.1 | 16.4 | 14.7 | 21.2 | 17.8 | 17.9 | 16.6 |
| Netherlands | 9.6 | 10.5 | 8.8 | 6.4 | 4.1 | 7.9 | 4.2 | 6.5 | 6.8 | 5.8 | 6.3 |
| Weighted average EMS ^{1/} | 11.5 | 10.3 | 8.6 | 7.9 | 6.2 | 8.9 | 7.6 | 10.2 | 10.0 | 9.3 | ... |
| Arithmetic average EMS | 13.5 | 12.6 | 10.8 | 9.8 | 7.2 | 10.7 | 8.7 | 11.9 | 11.9 | 10.3 | 10.9 |
| Standard deviation | 4.2 | 4.9 | 4.9 | 4.6 | 3.5 | 4.2 | 4.5 | 6.1 | 5.6 | 5.4 | 4.7 |
| Difference between highest and lowest rate | 12.1 | 14.9 | 13.7 | 13.3 | 9.4 | 12.7 | 10.6 | 15.7 | 14.5 | 13.6 | 12.1 |
| Coefficient of variation | 0.31 | 0.39 | 0.45 | 0.47 | 0.49 | 0.42 | 0.51 | 0.51 | 0.47 | 0.50 | 0.43 |
| Average absolute deviation | 3.1 | 3.6 | 3.8 | 3.6 | 2.9 | 3.4 | 3.8 | 4.9 | 4.9 | 4.6 | 3.7 |
| Japan | 24.4 | 11.8 | 9.3 | 8.0 | 3.8 | 11.3 | 3.6 | 8.0 | 4.9 | 5.5 | 2.9 |
| United Kingdom | 16.0 | 24.2 | 16.5 | 15.9 | 8.3 | 16.1 | 13.4 | 18.0 | 11.9 | 14.4 | 8.7 |
| United States | 11.0 | 9.1 | 5.8 | 6.5 | 7.6 | 8.0 | 11.3 | 13.5 | 10.4 | 11.7 | 6.2 |
| Sweden | 9.9 | 9.8 | 10.3 | 11.4 | 9.9 | 10.3 | 7.3 | 13.7 | 12.1 | 11.0 | 8.8 |
| Switzerland | 9.7 | 6.7 | 1.7 | 1.6 | 0.8 | 4.0 | 3.6 | 4.1 | 6.5 | 4.7 | 5.7 |
| Arithmetic average | 14.2 | 12.3 | 8.7 | 8.7 | 6.1 | 10.0 | 7.8 | 11.5 | 9.2 | 9.5 | 6.5 |
| Standard deviation | 6.3 | 6.9 | 5.5 | 5.4 | 3.7 | 5.6 | 4.4 | 5.4 | 3.3 | 4.4 | 2.4 |
| Coefficient of variation | 0.44 | 0.56 | 0.63 | 0.62 | 0.61 | 0.57 | 0.57 | 0.47 | 0.36 | 0.47 | 0.38 |
| Average absolute deviation | 4.8 | 4.7 | 4.0 | 4.0 | 3.0 | 4.1 | 3.6 | 4.3 | 2.8 | 3.6 | 1.8 |

Sources: IMF, International Financial Statistics; and staff estimates.^{1/} Weighted by real GDP (using 1980 weights in 1981).^{2/} Fund staff estimates.

Table 13. GDP Deflators

(Annual change in per cent)

| | 1974 | 1975 | 1976 | 1977 | 1978 | Average 1974-78 | 1979 | 1980 | 1981 | Average 1979-81 |
|---|------|------|------|------|------|--------------------|------|------|------|--------------------|
| Belgium | 12.2 | 12.7 | 7.7 | 7.4 | 4.2 | 8.8 | 4.0 | 4.4 | 5.0 | 4.5 |
| Denmark | 13.0 | 12.4 | 8.7 | 8.8 | 9.7 | 10.5 | 6.5 | 9.0 | 9.5 | 8.3 |
| France | 11.1 | 13.4 | 9.9 | 9.0 | 9.5 | 10.6 | 10.3 | 11.8 | 12.0 | 11.4 |
| Germany | 6.8 | 6.7 | 3.2 | 3.8 | 3.8 | 4.8 | 3.7 | 4.9 | 4.3 | 4.3 |
| Ireland | 6.4 | 22.2 | 20.1 | 12.2 | 10.6 | 14.3 | 12.6 | 14.2 | 17.3 | 14.7 |
| Italy | 18.5 | 17.5 | 18.0 | 19.5 | 13.9 | 17.5 | 15.9 | 20.8 | 17.6 | 18.1 |
| Netherlands | 9.2 | 11.2 | 8.9 | 6.3 | 5.2 | 8.1 | 4.1 | 5.0 | 5.5 | 4.9 |
| Weighted average EMS <u>1/</u> | 10.4 | 11.2 | 8.3 | 8.0 | 7.1 | 9.0 | 7.3 | 9.0 | 8.6 | 8.3 |
| Arithmetic average EMS | 11.0 | 13.7 | 10.9 | 9.6 | 8.1 | 10.6 | 8.2 | 10.0 | 10.2 | 9.5 |
| Standard deviation | 4.1 | 4.9 | 6.0 | 5.1 | 3.8 | 4.8 | 4.8 | 6.1 | 5.7 | 5.5 |
| Difference between highest and lowest rate | 12.0 | 15.5 | 16.9 | 15.7 | 10.1 | 14.0 | 12.1 | 16.4 | 12.6 | 13.7 |
| Coefficient of variation | 0.37 | 0.36 | 0.55 | 0.53 | 0.47 | 0.46 | 0.59 | 0.61 | 0.56 | 0.59 |
| Average absolute deviation | 3.3 | 3.5 | 4.6 | 3.6 | 3.2 | 3.6 | 4.1 | 4.8 | 4.7 | 4.5 |
| Japan | 20.6 | 8.1 | 6.4 | 5.7 | 4.6 | 8.9 | 2.6 | 3.0 | 2.9 | 2.8 |
| United Kingdom | 14.9 | 26.9 | 14.6 | 14.0 | 10.9 | 16.1 | 15.0 | 18.8 | 12.5 | 15.4 |
| United States | 8.9 | 9.3 | 5.2 | 5.8 | 7.4 | 7.3 | 8.6 | 9.3 | 9.4 | 9.1 |
| Sweden | 8.4 | 14.9 | 11.4 | 10.8 | 10.0 | 11.1 | 7.4 | 11.8 | 9.9 | 9.7 |
| Switzerland <u>2/</u> | 7.1 | 6.9 | 3.1 | 0.3 | 3.4 | 4.1 | 2.1 | 3.1 | 6.7 | 4.0 |
| Arithmetic average | 12.0 | 13.2 | 8.1 | 7.3 | 7.3 | 9.6 | 7.1 | 9.2 | 8.3 | 8.2 |
| Standard deviation | 5.7 | 8.2 | 4.7 | 5.3 | 3.3 | 5.4 | 5.2 | 6.6 | 3.6 | 5.1 |
| Coefficient of variation | 0.47 | 0.6 | 0.58 | 0.72 | 0.45 | 0.57 | 0.73 | 0.72 | 0.44 | 0.63 |
| Average absolute deviation | 4.6 | 6.1 | 3.9 | 4.1 | 2.6 | 4.3 | 3.8 | 4.9 | 4.4 | 3.0 |

Source: IMF, World Economic Outlook data file.1/ Weighted by real GDP (using 1980 weights in 1981).2/ GNP deflator.

Table 14. Short-term Interest Rates

(Monthly averages in per cent)

| | 1974 | 1975 | 1976 | 1977 | 1978 | Average 1974-78 | 1979 | 1980 | 1981 | Average 1979-81 |
|---|------|------|------|------|------|--------------------|------|------|------|--------------------|
| Belgium | 9.3 | 4.7 | 8.3 | 5.5 | 5.2 | 6.6 | 8.0 | 11.2 | 11.5 | 10.2 |
| Denmark | 13.3 | 6.5 | 10.3 | 14.5 | 15.4 | 12.0 | 12.6 | 16.9 | 14.8 | 14.8 |
| France | 12.9 | 7.9 | 8.6 | 9.1 | 8.0 | 9.3 | 9.0 | 11.9 | 15.3 | 12.1 |
| Germany | 9.9 | 5.0 | 4.3 | 4.4 | 3.7 | 5.5 | 6.7 | 9.5 | 12.1 | 9.4 |
| Ireland | 11.3 | 10.0 | 10.8 | 7.7 | 8.4 | 9.6 | 13.5 | 15.4 | 13.5 | 14.1 |
| Italy | 14.6 | 10.6 | 15.7 | 14.0 | 11.5 | 13.3 | 11.9 | 17.2 | 19.6 | 16.2 |
| Netherlands | 9.2 | 4.2 | 7.3 | 3.8 | 6.2 | 6.1 | 9.0 | 10.1 | 11.0 | 10.0 |
| Weighted average EMS ^{1/} | 11.3 | 6.5 | 7.8 | 7.3 | 6.8 | 7.9 | 8.6 | 11.7 | 13.6 | 11.3 |
| Arithmetic average EMS | 11.4 | 6.9 | 9.3 | 8.4 | 8.4 | 8.9 | 10.0 | 13.1 | 13.9 | 12.4 |
| Standard deviation | 2.3 | 2.7 | 3.5 | 4.4 | 4.0 | 3.3 | 2.8 | 3.3 | 3.1 | 2.9 |
| Difference between highest and lowest rate | 5.4 | 6.4 | 11.4 | 10.7 | 11.7 | 9.1 | 6.8 | 7.7 | 8.6 | 7.7 |
| Coefficient of variation | 0.20 | 0.39 | 0.38 | 0.52 | 0.48 | 0.39 | 0.28 | 0.25 | 0.22 | 0.24 |
| Average absolute deviation | 1.8 | 2.2 | 2.5 | 3.5 | 2.9 | 2.6 | 2.2 | 2.9 | 2.2 | 2.4 |
| Japan | 12.5 | 10.7 | 7.0 | 5.7 | 4.4 | 8.1 | 5.9 | 10.9 | 7.4 | 8.1 |
| United Kingdom | 11.4 | 10.6 | 11.6 | 8.1 | 3.7 | 9.1 | 13.6 | 16.1 | 13.3 | 14.3 |
| United States | 10.5 | 5.8 | 5.1 | 5.5 | 7.9 | 7.0 | 11.2 | 13.4 | 16.4 | 13.7 |
| Sweden | 7.5 | 7.8 | 7.9 | 10.0 | 7.2 | 8.1 | 8.2 | 12.2 | 14.4 | 11.6 |
| Arithmetic average non-EMS | 10.5 | 8.7 | 7.9 | 7.3 | 5.8 | 8.0 | 9.7 | 13.2 | 12.9 | 11.9 |
| Standard deviation | 2.2 | 2.4 | 2.7 | 2.1 | 2.1 | 2.3 | 3.4 | 2.2 | 3.9 | 3.2 |
| Coefficient of variation | 0.21 | 0.27 | 0.35 | 0.29 | 0.36 | 0.29 | 0.35 | 0.17 | 0.30 | 0.27 |
| Average absolute deviation | 1.5 | 1.9 | 1.9 | 1.7 | 1.8 | 1.8 | 2.7 | 1.6 | 2.7 | 2.3 |

Source: IMF, International Financial Statistics.^{1/} Weighted by real GDP (using 1980 weights in 1981).

Table 15. Long-Term Interest Rates

(Monthly averages in per cent)

| | 1974 | 1975 | 1976 | 1977 | 1978 | Average 1974-78 | 1979 | 1980 | 1981 | Average 1979-81 |
|---|------|------|------|------|------|--------------------|------|------|------|--------------------|
| Belgium | 8.7 | 8.5 | 9.1 | 8.8 | 8.5 | 8.7 | 9.5 | 12.0 | 13.7 | 11.7 |
| Denmark | 14.6 | 13.1 | 13.2 | 13.4 | 14.5 | 13.8 | 15.8 | 17.7 | 18.9 | 17.5 |
| France | 10.5 | 9.5 | 9.2 | 9.6 | 9.0 | 9.6 | 9.5 | 13.0 | 15.7 | 12.7 |
| Germany | 10.4 | 8.5 | 7.8 | 6.2 | 5.8 | 7.7 | 7.4 | 8.5 | 10.4 | 8.8 |
| Ireland | 16.9 | 14.6 | 15.5 | 11.3 | 12.8 | 14.2 | 15.1 | 15.4 | 17.3 | 15.9 |
| Italy | 9.9 | 11.5 | 13.1 | 14.6 | 13.7 | 12.6 | 14.1 | 16.1 | 20.6 | 16.9 |
| Netherlands | 9.8 | 8.8 | 9.0 | 8.1 | 7.7 | 8.7 | 8.8 | 10.2 | 11.6 | 10.2 |
| Weighted average EMS ^{1/} | 10.4 | 9.4 | 9.4 | 8.9 | 8.5 | 9.3 | 9.5 | 11.6 | 13.7 | 11.6 |
| Arithmetic average EMS | 11.5 | 10.7 | 11.0 | 10.3 | 10.3 | 10.7 | 11.4 | 13.3 | 15.4 | 13.4 |
| Standard deviation | 3.0 | 2.5 | 2.9 | 3.0 | 3.4 | 3.0 | 3.4 | 3.3 | 3.8 | 3.5 |
| Difference between highest and lowest rate | 8.2 | 6.1 | 7.7 | 8.4 | 8.7 | 7.8 | 8.4 | 9.2 | 10.2 | 9.3 |
| Coefficient of variation | 0.26 | 0.23 | 0.27 | 0.29 | 0.33 | 0.28 | 0.30 | 0.25 | 0.24 | 0.26 |
| Average absolute deviation | 2.4 | 2.1 | 2.5 | 2.4 | 2.7 | 2.4 | 3.0 | 2.7 | 3.1 | 2.9 |
| Japan | 9.3 | 9.2 | 8.7 | 7.3 | 6.1 | 8.1 | 7.7 | 9.2 | 8.7 | 8.5 |
| United Kingdom | 14.8 | 14.4 | 14.4 | 12.7 | 12.5 | 13.8 | 13.0 | 13.8 | 14.7 | 13.8 |
| United States | 8.1 | 8.2 | 7.9 | 7.7 | 8.5 | 8.1 | 9.3 | 11.4 | 13.7 | 11.5 |
| Sweden | 7.8 | 8.8 | 9.3 | 9.7 | 10.1 | 9.1 | 10.5 | 11.7 | 13.5 | 11.9 |
| Switzerland | 7.2 | 6.4 | 5.0 | 4.1 | 3.3 | 5.2 | 3.5 | 4.8 | 5.6 | 4.6 |
| Arithmetic average | 9.4 | 9.4 | 9.1 | 8.3 | 8.1 | 8.9 | 8.8 | 10.2 | 11.2 | 10.1 |
| Standard deviation | 3.1 | 3.0 | 3.4 | 3.2 | 3.6 | 3.3 | 3.5 | 3.4 | 3.9 | 3.6 |
| Coefficient of variation | 0.33 | 0.32 | 0.38 | 0.38 | 0.44 | 0.37 | 0.40 | 0.34 | 0.35 | 0.36 |
| Average absolute deviation | 2.1 | 2.0 | 1.9 | 2.3 | 2.7 | 2.2 | 3.3 | 2.5 | 3.3 | 3.0 |

Source: IMF, International Financial Statistics.^{1/} Weighted by real GDP (using 1980 weights in 1981).

Table 16. Matrix of Correlation Coefficients Between Long-Term Interest Rates
for the Period March 1976 to March 1979 and April 1979 to March 1982 ^{1/}

(Monthly averages)

| | Denmark | France | Germany | Ireland | Italy | Nether- lands | United Kingdom | United States |
|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|------------------|-------------------|------------------|
| Belgium | -0.445 0.792 | 0.239 0.979 | 0.768 0.882 | 0.767 0.663 | -0.012 0.906 | 0.642 0.913 | 0.681 0.771 | -0.422 0.933 |
| Denmark | | -0.517 0.811 | -0.272 0.640 | -0.445 0.602 | -0.210 0.834 | -0.258 0.732 | -0.357 0.652 | 0.573 0.793 |
| France | | | -0.079 0.904 | 0.213 0.718 | 0.628 0.944 | 0.050 0.923 | -0.015 0.795 | -0.843 0.941 |
| Germany | | | | 0.822 0.718 | -0.461 0.899 | 0.893 0.947 | 0.783 0.742 | -0.221 0.906 |
| Ireland | | | | | -0.188 0.741 | 0.667 0.651 | 0.923 0.777 | -0.456 0.753 |
| Italy | | | | | | -0.314 0.883 | -0.272 0.722 | -0.452 0.822 |
| Netherlands | | | | | | | 0.645 0.788 | -0.204 0.836 |
| United Kingdom | | | | | | | | -0.239 0.792 |

Sources: IMF, International Financial Statistics; and staff estimates.

^{1/} Line 1 shows the correlation coefficient for the period March 1976 to March 1979 and line 2 the correlation coefficient for the period April 1979 to March 1982.

Table 17. Matrix of Correlation Coefficients Between Short-Term Interest Rates
for the Period March 1976 to March 1979 and April 1979 to March 1982 ^{1/}

(Monthly averages)

| | Denmark | France | Germany | Ireland | Italy | Nether- lands | Unite Kingdom | United States |
|----------------|----------------|----------------|-----------------|-----------------|-----------------|------------------|------------------|------------------|
| Belgium | 0.102 0.445 | 0.310 0.502 | 0.480 0.629 | 0.532 0.488 | 0.537 0.565 | 0.627 0.463 | 0.601 0.340 | -0.290 0.335 |
| Denmark | | 0.201 0.398 | -0.142 0.340 | -0.186 0.605 | -0.371 0.175 | 0.032 0.456 | -0.334 0.510 | 0.100 0.120 |
| France | | | 0.505 0.809 | 0.055 0.560 | 0.433 0.783 | 0.050 0.644 | 0.321 -0.032 | -0.730 0.550 |
| Germany | | | | 0.560 0.050 | 0.605 0.809 | 0.312 0.567 | 0.763 -0.151 | -0.454 0.654 |
| Ireland | | | | | 0.388 -0.024 | 0.524 0.415 | 0.716 0.800 | 0.043 -0.052 |
| Italy | | | | | | 0.115 0.436 | 0.713 -0.021 | -0.775 0.547 |
| Netherlands | | | | | | | 0.323 0.404 | 0.210 0.262 |
| United Kingdom | | | | | | | | -0.392 -0.221 |

Sources: IMF, International Financial Statistics; and staff estimates.

^{1/} For every country, line 1 indicates the correlation coefficient for the three-year period (March 1976-March 1979) prior to the introduction of EMS and line 2 the correlation coefficient for the three-year period from April 1979 to March 1982.

Table 18. Rate of Growth of Narrow Money
(Annual change in per cent)

| | 1974 | 1975 | 1976 | 1977 | 1978 | Average 1974-78 | 1979 | 1980 | 1981 | Average 1979-81 |
|----------------------------|------|------|------|------|------|--------------------|------|------|------|--------------------|
| Belgium | 6.2 | 15.7 | 7.0 | 8.3 | 5.9 | 8.6 | 25.0 | 0.2 | 2.2 | 1.6 |
| Denmark | 4.7 | 30.2 | 6.3 | 8.0 | 16.1 | 12.7 | 9.9 | 10.9 | 11.8 | 10.9 |
| France | 15.2 | 12.6 | 7.5 | 11.1 | 11.1 | 11.5 | 11.8 | 6.4 | 15.9 | 11.4 |
| Germany | 10.7 | 14.3 | 3.3 | 12.0 | 14.5 | 10.9 | 2.9 | 3.9 | -1.6 | 1.7 |
| Ireland | 9.0 | 19.9 | 16.9 | 22.5 | 27.6 | 19.2 | 8.1 | 14.0 | 3.4 | 8.5 |
| Italy | 9.4 | 13.5 | 18.9 | 21.4 | 26.6 | 18.0 | 23.7 | 12.9 | 9.8 | 15.5 |
| Netherlands | 12.2 | 19.7 | 8.2 | 13.2 | 4.2 | 11.5 | 2.8 | 6.0 | -2.4 | 2.1 |
| Arithmetic average EMS | 9.6 | 18.0 | 9.7 | 13.8 | 15.1 | 13.2 | 8.8 | 7.8 | 5.6 | 7.4 |
| Standard deviation | 3.5 | 6.1 | 5.8 | 5.9 | 9.2 | 6.1 | 7.6 | 5.0 | 7.0 | 6.5 |
| Coefficient of variation | 0.37 | 0.34 | 0.60 | 0.43 | 0.61 | 0.47 | 0.86 | 0.65 | 1.25 | 0.92 |
| Average absolute deviation | 2.6 | 4.5 | 4.7 | 4.7 | 7.0 | 3.0 | 5.4 | 4.2 | 5.9 | 5.2 |
| Japan | 11.5 | 11.1 | 12.5 | 8.2 | 13.4 | 11.3 | 3.0 | -2.0 | 10.0 | 3.6 |
| Sweden | 13.8 | 14.1 | 3.6 | 10.1 | 17.1 | 11.6 | 15.6 | 18.3 | 8.0 | 13.9 |
| Switzerland | -1.4 | 4.9 | 11.2 | 7.5 | 22.9 | 8.7 | -2.8 | -0.9 | 2.7 | -0.4 |
| United Kingdom | 10.8 | ... | 11.3 | 21.5 | 16.4 | ... | 9.1 | 3.9 | ... | ... |
| United States | 3.1 | 5.5 | 5.9 | 8.2 | 8.1 | 5.1 | 8.0 | 5.5 | 5.5 | 6.3 |
| Arithmetic average non-EMS | 7.6 | ... | 8.9 | 11.1 | 15.4 | ... | 6.6 | 5.0 | ... | ... |
| Standard deviation | 6.4 | ... | 3.9 | 5.9 | 5.4 | ... | 6.9 | 8.1 | ... | ... |
| Coefficient of variation | 0.85 | ... | 0.44 | 0.53 | 0.35 | ... | 1.0 | 1.6 | ... | ... |
| Average absolute deviation | 5.4 | ... | 3.3 | 4.2 | 3.9 | ... | 5.2 | 5.6 | ... | ... |

Source: IMF, International Financial Statistics.

Table 19. Rate of Growth of Broad Money 1/ 2/

(Annual change in per cent)

| | 1974 | 1975 | 1976 | 1977 | 1978 | Average 1974-78 | 1979 | 1980 | 1981 | Average 1979-81 |
|--------------------------------|------|------|------|------|------|--------------------|------|------|------|--------------------|
| Belgium | 8.7 | 15.3 | 12.6 | 8.4 | 7.5 | 10.5 | 6.2 | 3.3 | 6.5 | 5.3 |
| Denmark | 8.4 | 26.9 | 11.7 | 9.3 | 6.4 | 12.3 | 10.2 | 11.7 | 10.8 | 10.9 |
| France | 17.8 | 15.7 | 12.3 | 14.6 | 12.2 | 14.5 | 13.9 | 8.3 | 11.1 | 11.1 |
| Germany | 7.2 | 11.5 | 7.6 | 10.3 | 10.3 | 9.4 | 5.2 | 4.6 | 3.7 | 4.5 |
| Ireland | 19.3 | 21.7 | 13.0 | 20.6 | 23.5 | 19.6 | 13.6 | 20.6 | 10.8 | 14.9 |
| Italy | 15.7 | 24.4 | 21.0 | 22.2 | 23.0 | 21.2 | 19.4 | 12.2 | 10.2 | 13.9 |
| Netherlands | 16.1 | 12.9 | 17.1 | 12.9 | 11.4 | 14.0 | 11.6 | 5.6 | 7.8 | 8.3 |
| Weighted average EMS <u>3/</u> | 12.8 | 16.6 | 13.3 | 14.5 | 13.8 | 14.2 | 11.5 | 7.7 | 7.9 | 9.0 |
| Arithmetic average EMS | 13.3 | 18.4 | 13.6 | 14.0 | 13.5 | 14.5 | 11.4 | 9.5 | 8.7 | 9.8 |
| Standard deviation | 5.0 | 6.0 | 4.3 | 5.5 | 7.0 | 5.6 | 4.9 | 6.0 | 2.8 | 4.6 |
| Coefficient of variation | 0.38 | 0.33 | 0.31 | 0.39 | 0.52 | 0.39 | 0.43 | 0.63 | 0.33 | 0.46 |
| Average absolute deviation | 4.5 | 5.1 | 3.1 | 4.4 | 5.6 | 4.5 | 3.6 | 4.6 | 2.3 | 3.3 |
| Japan | 11.5 | 14.5 | 13.5 | 11.1 | 13.1 | 12.7 | 8.4 | 6.8 | 10.7 | 8.6 |
| United Kingdom | 12.9 | ... | 11.6 | 9.8 | 14.6 | ... | 12.5 | 18.4 | ... | ... |
| United States | 4.6 | 10.2 | 12.5 | 8.1 | 5.4 | 8.1 | 8.0 | 7.8 | 7.2 | 7.6 |
| Sweden | 9.7 | 11.6 | 5.1 | 9.1 | 17.4 | 10.5 | 17.1 | 12.2 | 13.3 | 14.2 |
| Switzerland | 5.0 | 7.5 | 8.5 | 6.9 | 10.5 | 7.7 | 10.0 | 3.9 | 6.9 | 6.9 |
| Arithmetic average | 8.7 | ... | 10.2 | 9.0 | 12.2 | ... | 11.2 | 9.8 | ... | ... |
| Standard deviation | 3.9 | ... | 3.5 | 1.6 | 4.5 | ... | 3.7 | 5.6 | | |
| Coefficient of variation | 0.45 | ... | 0.34 | 0.18 | 0.37 | ... | 0.32 | 0.57 | | |
| Average absolute deviation | 3.2 | ... | 2.8 | 1.2 | 3.4 | ... | 2.9 | 4.4 | ... | ... |

Source: IMF, International Financial Statistics.1/ Broad money (M2) defined as money and quasi-money,2/ End of year data.3/ Weighted by the broad money stock in the previous year converted into dollars using the average dollar exchange rate.

Table 20. Rates of Growth of Domestic Credit

(Annual change in per cent)

| | 1974 | 1975 | 1976 | 1977 | 1978 | Average 1974-78 | 1979 | 1980 | 1981 | Average 1979-81 |
|----------------------------|------|------|------|------|------|--------------------|------|------|------|--------------------|
| Belgium | 10.6 | 13.8 | 16.3 | 15.2 | 10.8 | 13.3 | 14.8 | 11.5 | 12.9 | 13.1 |
| Denmark | 10.4 | 26.7 | 14.7 | 3.4 | 4.2 | 11.6 | 12.3 | 13.3 | 14.5 | 13.4 |
| France | 19.3 | 17.1 | 21.1 | 20.7 | 8.8 | 17.3 | 14.0 | 12.3 | 14.0 | 13.4 |
| Germany | 8.0 | 10.1 | 10.6 | 10.0 | 11.4 | 10.0 | 11.9 | 9.5 | 8.8 | 10.1 |
| Ireland | 19.5 | 18.1 | 12.9 | 20.4 | 30.1 | 20.1 | 30.4 | 15.3 | 15.2 | 20.1 |
| Italy | 23.8 | 23.5 | 21.4 | 16.3 | 17.4 | 20.4 | 16.0 | 16.6 | 12.6 | 15.1 |
| Netherlands | 16.5 | 14.3 | 19.7 | 23.1 | 21.0 | 18.9 | 17.2 | 10.4 | 5.9 | 11.1 |
| Average (EMS) | 15.4 | 17.7 | 16.7 | 15.6 | 14.8 | 15.9 | 16.7 | 12.7 | 12.0 | 13.8 |
| Standard deviation | 5.9 | 5.8 | 4.2 | 6.9 | 8.7 | 6.3 | 6.3 | 2.6 | 3.4 | 4.1 |
| Coefficient of variation | 0.38 | 0.33 | 0.25 | 0.44 | 0.59 | 0.40 | 0.38 | 0.20 | 0.28 | 0.29 |
| Average absolute deviation | 5.0 | 4.4 | 3.5 | 5.2 | 6.9 | 5.0 | 4.1 | 2.0 | 2.6 | 2.9 |
| United States | 9.9 | 4.4 | 8.1 | 10.3 | 11.0 | 8.7 | 11.4 | 7.7 | 8.7 | 9.3 |
| United Kingdom | 17.5 | ... | 13.8 | 6.0 | 10.0 | ... | 9.8 | 14.3 | ... | ... |
| Japan | 15.0 | 16.7 | 13.7 | 10.5 | 13.7 | 13.9 | 8.4 | 8.4 | 10.0 | 8.9 |
| Sweden | 12.8 | 13.6 | 7.8 | 11.5 | 19.5 | 13.0 | 18.2 | 13.4 | 18.6 | 16.7 |
| Switzerland | 5.9 | 6.2 | 7.1 | 6.6 | 8.6 | 6.9 | 8.9 | 11.1 | 8.5 | 9.5 |
| Average (non-EMS) | 12.2 | ... | 10.1 | 9.0 | 12.6 | ... | 11.4 | 11.0 | ... | ... |
| Standard deviation | 4.6 | ... | 3.4 | 2.4 | 4.3 | ... | 4.0 | 2.8 | ... | ... |
| Coefficient of variation | 0.37 | ... | 0.33 | 0.27 | 0.34 | ... | 0.35 | 0.26 | ... | ... |
| Average absolute deviation | 3.5 | ... | 2.9 | 2.1 | 3.2 | ... | 2.8 | 2.3 | ... | ... |

Source: IMF, International Financial Statistics.

Table 21. Real Narrow Money Stock 1/

(Annual change in per cent)

| | 1974 | 1975 | 1976 | 1977 | 1978 | <u>Average</u> 1974-78 | 1979 | 1980 | 1981 | <u>Average</u> 1979-81 |
|----------------------------|------|------|------|------|------|---------------------------|------|-------|-------|---------------------------|
| Belgium | -5.8 | 2.7 | -2.0 | 1.1 | 1.0 | -0.6 | -1.8 | -6.0 | -5.1 | -4.3 |
| Denmark | -9.1 | 18.8 | -2.5 | -2.8 | 5.5 | 2.0 | 0.3 | -1.2 | 0.1 | -0.3 |
| France | 1.3 | 0.7 | -1.9 | 1.6 | 1.8 | 0.7 | 0.9 | -6.1 | 2.3 | -1.0 |
| Germany | 3.6 | 7.8 | -1.0 | 8.0 | 11.5 | 6.0 | -1.2 | -1.5 | -7.1 | -3.2 |
| Ireland | -6.8 | -0.8 | -0.9 | 7.8 | 18.6 | 3.6 | -4.5 | -3.6 | -14.1 | -7.5 |
| Italy | -8.1 | -3.0 | 1.8 | 3.8 | 12.9 | 1.5 | 7.8 | -6.8 | -6.8 | -2.2 |
| Netherlands | 2.4 | 8.3 | -0.6 | 6.4 | 0.1 | 3.3 | -1.3 | -0.5 | -8.5 | -3.5 |
| Arithmetic average EMS | -3.3 | 4.9 | -1.0 | 3.7 | 7.3 | 2.2 | -- | -3.7 | -5.6 | -3.1 |
| Standard deviation | 5.4 | 7.4 | 1.4 | 4.0 | 7.0 | 2.1 | 3.8 | 2.6 | 5.5 | 4.0 |
| Coefficient of variation | -1.7 | 1.5 | -1.4 | 1.1 | 1.0 | 1.0 | ... | -0.72 | -1.0 | ... |
| Average absolute deviation | 4.8 | 5.8 | 1.0 | 3.2 | 5.9 | 1.7 | 2.4 | 2.3 | 4.0 | 1.7 |

Source: Tables 12 and 18.

1/ Deflated by the consumer price index.

Table 22. Real Broad Money Stock 1/

(Annual change in per cent)

| | 1974 | 1975 | 1976 | 1977 | 1978 | Average 1974-78 | 1979 | 1980 | 1981 | Average 1979-81 |
|----------------------------|-------|------|------|------|------|--------------------|------|------|------|--------------------|
| Belgium | -3.5 | 2.3 | 3.1 | 1.2 | 2.9 | 1.1 | 1.6 | -3.1 | -1.1 | 1.0 |
| Denmark | -5.9 | 15.8 | 2.5 | -1.6 | -3.3 | 1.5 | 0.5 | -0.5 | -0.8 | -0.3 |
| France | 3.6 | 3.5 | 2.5 | 4.8 | 2.8 | 3.5 | 2.8 | -4.4 | -1.9 | -1.2 |
| Germany | 0.3 | 5.2 | 3.2 | 6.4 | 7.4 | 4.5 | 1.1 | -0.9 | -2.1 | -0.7 |
| Ireland | 2.0 | 0.7 | -4.2 | 6.2 | 14.8 | 3.9 | 0.4 | 2.0 | -8.0 | -1.9 |
| Italy | -2.9 | 6.3 | 3.6 | 4.4 | 9.7 | 4.3 | 4.1 | -7.4 | -6.5 | -3.3 |
| Netherlands | 5.9 | 2.2 | 7.6 | 6.1 | 7.0 | 5.8 | 7.1 | -0.8 | 0.9 | 2.4 |
| Arithmetic average EMS | -0.1 | 5.1 | 2.5 | 3.9 | 5.9 | 3.4 | 2.5 | -2.2 | -2.8 | -0.8 |
| Standard deviation | 4.2 | 5.1 | 3.5 | 3.0 | 5.8 | 1.7 | 2.4 | 3.1 | 3.3 | 1.7 |
| Coefficient of variation | -42.0 | 1.0 | 1.4 | 0.8 | 1.0 | 0.5 | 1.0 | -1.4 | -1.2 | -2.1 |
| Average absolute deviation | 3.5 | 3.4 | 2.0 | 2.4 | 4.4 | 1.3 | 1.8 | 2.4 | 2.6 | 1.1 |

Source: Tables 12 and 19.

1/ Deflated by the consumer price index.

Table 23. Real Domestic Credit 1/

(Annual change in per cent)

| | 1974 | 1975 | 1976 | 1977 | 1978 | <u>Average</u> 1974-78 | 1979 | 1980 | 1981 | <u>Average</u> 1979-81 |
|----------------------------|------|------|------|------|------|---------------------------|------|------|------|---------------------------|
| Belgium | -1.9 | 1.0 | 6.5 | 7.6 | 6.0 | 3.8 | 9.9 | 4.6 | 4.9 | 6.4 |
| Denmark | -4.2 | 15.6 | 5.2 | -6.9 | -5.3 | 0.5 | 2.5 | 0.9 | 2.5 | 2.0 |
| France | 4.9 | 4.7 | 10.5 | 10.3 | -0.3 | 5.9 | 2.9 | -0.9 | 0.6 | 0.9 |
| Germany | 1.0 | 3.9 | 6.0 | 6.1 | 8.5 | 5.1 | 7.5 | 3.8 | 2.7 | 4.6 |
| Ireland | 2.1 | -2.3 | -4.3 | 6.0 | 20.9 | 4.1 | 15.2 | -2.5 | -4.3 | 2.4 |
| Italy | 3.9 | 5.6 | 3.9 | -0.6 | 4.7 | 3.5 | 1.1 | -3.8 | -4.4 | -2.4 |
| Netherlands | 6.3 | 3.4 | 10.0 | 15.7 | 16.2 | 10.2 | 12.5 | 3.7 | -0.8 | 5.0 |
| Arithmetic average EMS | 1.7 | 4.6 | 5.4 | 5.5 | 7.2 | 4.7 | 7.4 | 0.8 | 0.2 | 2.7 |
| Standard deviation | 3.8 | 5.5 | 4.9 | 7.3 | 9.0 | 2.9 | 5.4 | 3.3 | 3.6 | 3.0 |
| Coefficient of variation | 2.2 | 1.2 | 0.9 | 1.3 | 1.3 | 0.6 | 0.7 | 4.1 | 18.1 | 1.1 |
| Average absolute deviation | 2.9 | 3.5 | 3.3 | 5.2 | 6.7 | 2.0 | 4.5 | 2.8 | 2.9 | 2.3 |

Source: Tables 12 and 20.

1/ Deflated by the consumer price index.

Table 24. Central Government Budget Deficit as a Ratio to Nominal GDP

(In per cent)

| | 1974 | 1975 | 1976 | 1977 | 1978 | Average 1974-78 | 1979 | 1980 | 1981 | Average 1979-81 |
|----------------------------|------|------|------|------|------|--------------------|------|------|------|--------------------|
| Belgium | 2.8 | 4.7 | 5.1 | 5.9 | 6.0 | 4.9 | 6.5 | 8.7 | 12.2 | 9.1 |
| Denmark | -3.0 | 3.5 | 2.8 | 2.6 | 2.8 | 1.7 | 3.7 | 4.8 | 8.3 | 5.6 |
| France | -0.3 | 3.0 | 0.8 | 0.8 | 0.8 | 1.0 | 0.1 | -- | 1.1 | 0.4 |
| Germany | 1.0 | 3.3 | 2.7 | 1.9 | 2.0 | 2.2 | 1.9 | 1.9 | 2.5 | 2.1 |
| Ireland | 11.8 | 13.4 | 10.8 | 10.1 | 13.3 | 11.9 | 14.1 | 14.7 | 17.2 | 15.3 |
| Italy | 8.1 | 13.1 | 9.3 | 11.8 | 15.4 | 11.5 | 11.1 | 11.0 | 13.4 | 11.8 |
| Netherlands | 0.6 | 3.1 | 3.6 | 2.9 | 3.1 | 2.7 | 4.2 | 4.6 | 6.0 | 4.9 |
| Weighted average EMS 1/ | 1.6 | 4.7 | 3.4 | 3.4 | 3.9 | 3.4 | 3.4 | 3.6 | 5.0 | 4.0 |
| Arithmetic average EMS | 3.0 | 6.3 | 5.0 | 5.1 | 6.2 | 5.1 | 5.9 | 6.5 | 8.7 | 7.0 |
| Standard deviation | 5.2 | 4.8 | 3.7 | 4.3 | 5.8 | 4.8 | 5.1 | 5.2 | 5.9 | 5.4 |
| Coefficient of variation | 1.72 | 0.76 | 0.74 | 0.84 | 0.94 | 1.0 | 0.85 | 0.80 | 0.68 | 0.78 |
| Average absolute deviation | 4.0 | 4.0 | 2.9 | 3.5 | 4.7 | 3.8 | 4.0 | 4.2 | 4.8 | 4.3 |
| Japan | 1.3 | 4.8 | 2.0 | 6.2 | 6.6 | 4.2 | 5.4 | 6.2 | 5.3 | 5.6 |
| United Kingdom | 4.2 | 8.0 | 5.4 | 3.1 | 5.1 | 5.2 | 5.4 | 5.0 | 4.1 | 4.8 |
| United States | 0.8 | 4.9 | 3.3 | 2.7 | 2.1 | 2.8 | 1.2 | 2.7 | 2.5 | 2.1 |
| Switzerland | 0.6 | 1.3 | 1.0 | 0.9 | 0.0 | 0.8 | 1.5 | 0.0 | 0.8 | 0.8 |
| Arithmetic average | 1.7 | 4.8 | 2.9 | 3.2 | 3.5 | 3.3 | 3.4 | 3.5 | 3.2 | 3.4 |
| Standard deviation | 1.7 | 2.7 | 1.9 | 2.2 | 3.0 | 2.3 | 2.3 | 2.7 | 2.0 | 2.3 |
| Coefficient of variation | 0.97 | 0.58 | 0.65 | 0.68 | 0.86 | 0.75 | 0.69 | 0.79 | 0.62 | 0.7 |
| Average absolute deviation | 1.2 | 1.7 | 1.1 | 1.2 | 2.4 | 1.5 | 2.0 | 1.3 | 1.5 | 1.6 |

Sources: IMF, International Financial Statistics; and national accounts.

1/ Weighted by real GDP in the current year (using 1980 weights in 1981).

Table 25. Budget Deficits and Changes in Money Supply 1/

(In per cent)

| | 1974 | 1975 | 1976 | 1977 | 1978 | Average 1974-78 | 1979 | 1980 | 1981 | Average 1979-81 |
|-------------|-------|-------|------|-------|-------|--------------------|-------|-------|-------|--------------------|
| Belgium | 31.0 | 41.2 | 60.5 | 81.2 | 86.7 | 60.1 | 170.7 | 515.9 | 297.8 | 328.1 |
| Denmark | -48.8 | 19.9 | 16.1 | 40.3 | 78.7 | 21.2 | 77.5 | 130.4 | 163.8 | 123.9 |
| Germany | 38.2 | 154.6 | 97.6 | 49.2 | 54.5 | 78.8 | 106.8 | 118.9 | 189.1 | 138.3 |
| France | -8.8 | 27.1 | 8.1 | 12.4 | 31.2 | 14.0 | 12.4 | -9.9 | 36.7 | 13.1 |
| Ireland | 59.9 | 105.6 | 97.0 | 79.8 | 56.2 | 79.7 | 108.0 | 124.1 | 144.9 | 125.7 |
| Italy | 56.1 | 60.2 | 48.3 | 40.4 | 46.0 | 50.2 | 46.1 | 56.3 | 84.3 | 62.2 |
| Netherlands | 1.5 | 144.5 | 34.5 | 116.7 | 160.1 | 91.5 | 139.3 | 248.7 | 288.0 | 225.3 |

Source: European Economy, No. 12, July 1982, p. 28.

1/ General government borrowing requirement (+) or financial surplus (-) divided by the increase in broad money supply.

Table 26. Balance of Payments Current Account

(In billions of U.S. dollars)

| | 1974 | 1975 | 1976 | 1977 | 1978 | Average 1974-78 | 1979 | 1980 | 1981 | Average 1979-81 |
|------------------------|------|------|------|-------|-------|--------------------|------|-------|------|--------------------|
| Belgium | 0.6 | 0.3 | ... | -0.7 | -1.0 | -0.2 | -3.0 | -5.2 | ... | ... |
| Denmark | -1.0 | -0.5 | -1.9 | -1.7 | -1.5 | -1.3 | -3.0 | -2.5 | -1.9 | -2.4 |
| France | -5.8 | -0.2 | -5.7 | -3.1 | 3.3 | -2.3 | 1.2 | -7.9 | -7.3 | -4.6 |
| Germany | 10.4 | 4.1 | 3.9 | 4.1 | 9.2 | 6.3 | -6.1 | -16.5 | -7.2 | -9.9 |
| Ireland | -0.7 | -0.1 | -0.3 | -0.4 | -0.5 | -0.4 | -1.7 | -1.7 | ... | ... |
| Italy | -8.1 | -0.6 | -2.9 | 2.4 | 6.2 | -0.6 | 5.4 | -9.8 | -8.7 | -4.4 |
| Netherlands | 2.2 | 2.0 | 2.7 | 0.6 | -1.4 | 1.2 | -2.1 | -2.8 | 3.2 | -0.6 |
| Arithmetic average EMS | -0.3 | 0.7 | -0.6 | 0.2 | 2.0 | 0.4 | -1.3 | -6.6 | ... | ... |
| Japan | -4.7 | -0.7 | 3.7 | 10.9 | 17.5 | 5.4 | -8.8 | -10.8 | 4.8 | -4.9 |
| United Kingdom | -7.7 | -3.5 | -1.6 | ... | 2.0 | -2.1 | -1.7 | 6.9 | 12.7 | 6.0 |
| United States | 2.1 | 18.3 | 4.4 | -14.1 | -14.8 | -0.8 | -0.5 | 1.5 | 4.4 | 1.8 |
| Sweden | -0.6 | -0.3 | -1.6 | -2.2 | -0.3 | -1.0 | -2.4 | -4.4 | -2.8 | -3.2 |
| Switzerland | 0.2 | 2.6 | 3.5 | 3.8 | 4.4 | 2.9 | 2.4 | -0.6 | 2.6 | 1.5 |

Source: IMF, International Financial Statistics.

Table 27. ECU Creation Through the Swap System

| Swap period beginning | Gold deposits (million ounces) | Dollar amount (billions) | Gold rate (ECU per ounce) | \$1 = ... ECU | ECU equivalent (billions) | | |
|--------------------------|--------------------------------------|--------------------------------|---------------------------------|------------------|---------------------------|---------|-------|
| | | | | | Gold | Dollars | Total |
| April 1979 | 80.7 | 13.4 | 165 | 0.75 | 13.3 | 10.0 | 23.3 |
| July 1979 ^{1/} | 85.3 | 15.9 | 185 | 0.73 | 15.8 | 11.6 | 27.4 |
| Oct. 1979 | 85.3 | 16.0 | 211 | 0.70 | 18.0 | 11.3 | 29.3 |
| Jan. 1980 | 85.5 | 15.5 | 259 | 0.69 | 22.2 | 10.7 | 32.9 |
| April 1980 | 85.6 | 14.4 | 370 | 0.77 | 31.7 | 11.1 | 42.8 |
| July 1980 | 85.6 | 13.7 | 419 | 0.70 | 35.9 | 9.6 | 45.5 |
| Oct. 1980 | 85.6 | 13.9 | 425 | 0.71 | 36.4 | 9.9 | 46.3 |
| Jan. 1981 | 85.6 | 14.5 | 447 | 0.75 | 38.3 | 10.9 | 49.2 |
| April 1981 | 85.7 | 14.2 | 440 | 0.84 | 37.7 | 12.0 | 49.7 |
| July 1981 | 85.7 | 12.7 | 406 | 0.97 | 34.8 | 12.3 | 47.1 |
| Oct. 1981 | 85.7 | 11.5 | 402 | 0.91 | 34.5 | 10.5 | 45.0 |
| Jan. 1982 | 85.7 | 11.7 | 368 | 0.92 | 31.6 | 10.7 | 42.3 |
| April 1982 | 85.7 | 10.5 | 327 | 1.00 | 28.0 | 10.5 | 38.6 |
| July 1982 | 85.7 | 9.9 | 324 | 1.04 | 27.8 | 10.3 | 38.1 |
| October 1982 | 85.7 | 10.0 | 367 | 0.92 | 31.5 | 10.8 | 42.3 |
| December 1982 | 85.7 | 9.6 | 367 | 0.92 | 31.5 | 10.4 | 41.9 |

Source: European Commission.

^{1/} The Bank of England transferred 20 per cent of its gold and dollar reserves as from July 1979.

Table 28. Real Rates of Growth of GDP

(Annual change in per cent)

| | 1974 | 1975 | 1976 | 1977 | 1978 | Average 1974-78 | 1979 | 1980 | 1981 | Average 1979-81 |
|------------------------------------|------|-------|------|------|------|--------------------|------|------|-------|--------------------|
| Belgium | 4.6 | -1.8 | 5.6 | 0.6 | 3.0 | 2.4 | 2.3 | 2.2 | -1.6 | 1.0 |
| Denmark | -0.9 | -0.6 | 7.9 | 1.9 | 1.9 | 2.0 | 3.1 | 0.6 | -0.2 | 1.2 |
| France | 3.3 | 0.2 | 5.2 | 3.1 | 3.8 | 3.1 | 3.3 | 1.1 | 0.2 | 1.5 |
| Germany | 0.4 | -1.7 | 5.3 | 2.8 | 3.5 | 2.1 | 4.0 | 1.8 | -0.2 | 1.9 |
| Ireland | 4.2 | 1.5 | 1.6 | 6.3 | 6.2 | 4.0 | 2.5 | 1.3 | 1.0 | 1.6 |
| Italy | 4.1 | -3.6 | 5.9 | 1.9 | 2.7 | 2.2 | 4.9 | 3.9 | -0.2 | 2.9 |
| Luxembourg | 3.6 | -6.1 | 1.6 | 0.8 | 4.6 | 0.9 | 4.2 | 0.6 | -3.3 | 0.5 |
| Netherlands | 3.6 | -1.9 | 5.6 | 7.7 | 2.4 | 3.5 | 1.8 | 0.7 | -1.0 | 0.5 |
| Weighted average EMS ^{1/} | 2.3 | -1.4 | 5.5 | 3.1 | 3.3 | 2.6 | 3.7 | 1.7 | -0.3 | 1.7 |
| Arithmetic average EMS | 2.9 | -1.8 | 4.8 | 3.1 | 3.5 | 2.5 | 3.3 | 1.5 | -0.7 | 1.4 |
| Standard deviation | 2.0 | 2.3 | 2.2 | 2.5 | 1.4 | 2.1 | 1.1 | 1.1 | 1.4 | 1.2 |
| Coefficient variation | 0.70 | -1.31 | 0.45 | 0.81 | 0.39 | 0.21 | 0.33 | 0.74 | -1.85 | -0.26 |
| Average absolute deviation | 1.8 | 1.8 | 1.9 | 2.2 | 1.2 | 1.8 | 1.0 | 0.9 | 1.1 | 1.0 |
| Japan | -1.2 | 2.4 | 5.3 | 5.3 | 5.1 | 3.4 | 5.2 | 4.2 | 2.9 | 4.1 |
| United Kingdom | -1.8 | -1.0 | 2.8 | 2.2 | 3.7 | 1.2 | 1.9 | -2.1 | -2.2 | -0.8 |
| United States | -0.7 | -1.2 | 5.4 | 5.5 | 5.0 | 2.8 | 2.8 | -0.4 | 1.9 | 1.4 |
| Sweden | 4.3 | 2.2 | 1.2 | -2.0 | 1.3 | 1.4 | 4.3 | 1.8 | -0.8 | 1.8 |
| Switzerland ^{2/} | 1.7 | -7.7 | -0.4 | 2.8 | 0.4 | -0.6 | 2.8 | 3.9 | 1.4 | 2.7 |
| Arithmetic average | 0.5 | -1.1 | 2.9 | 2.8 | 3.1 | 1.6 | 3.4 | 1.5 | 0.6 | 1.8 |
| Standard deviation | 2.5 | 4.1 | 2.5 | 3.0 | 2.2 | 2.9 | 1.3 | 2.7 | 2.1 | 2.0 |
| Coefficient of variation | 5.49 | -3.85 | 0.89 | 0.10 | 0.69 | 0.86 | 0.39 | 1.84 | 3.26 | 1.83 |
| Average absolute deviation | 2.0 | 2.7 | 2.0 | 1.3 | 1.8 | 2.0 | 1.1 | 0.5 | 1.7 | 1.1 |

Source: IMF, World Economic Outlook data file.

^{1/} Weighted by the real GDP in the previous year, converted into dollars using the dollar exchange rate of 1975.^{2/} Rate of growth of real GNP.

Table 29. Gross Fixed Capital Formation

(In per cent of GDP)

| | 1974 | 1975 | 1976 | 1977 | 1978 | Average 1974-78 | 1979 | 1980 | 1981 | Average 1979-81 |
|---|------|------|------|------|------|--------------------|------|------|------|--------------------|
| Belgium | 22.3 | 22.1 | 21.6 | 21.3 | 21.1 | 21.7 | 20.2 | 21.0 | ... | ... |
| Denmark | 24.0 | 21.1 | 23.0 | 22.1 | 21.7 | 22.4 | 21.0 | 18.4 | 15.6 | 18.3 |
| France | 24.3 | 23.3 | 23.3 | 22.3 | 21.4 | 22.9 | 21.4 | 21.6 | 21.0 | 21.3 |
| Germany | 21.9 | 20.7 | 20.7 | 20.7 | 20.7 | 20.9 | 21.8 | 22.8 | 22.0 | 22.2 |
| Ireland | 25.2 | 23.3 | 24.7 | 25.0 | 27.8 | 25.2 | 31.3 | 29.4 | 29.7 | 30.1 |
| Italy | 22.4 | 20.6 | 20.0 | 19.6 | 18.7 | 20.3 | 18.8 | 19.8 | 20.3 | 19.6 |
| Netherlands | 21.8 | 20.8 | 19.2 | 21.1 | 21.3 | 20.8 | 21.1 | 21.0 | 19.0 | 20.4 |
| Arithmetic average EMS | 23.1 | 21.7 | 21.8 | 21.7 | 21.8 | 22.0 | 22.2 | 22.0 | ... | ... |
| Weighted average EMS ^{1/} | 22.7 | 21.5 | 21.3 | 21.1 | 21.0 | 21.5 | 21.4 | 21.8 | ... | ... |
| Standard deviation | 1.3 | 1.2 | 2.0 | 1.7 | 2.8 | 1.8 | 4.1 | 3.6 | ... | ... |
| Difference between highest and lowest rate | 3.4 | 2.7 | 5.5 | 5.4 | 9.1 | 5.2 | 12.5 | 11.0 | ... | ... |
| Coefficient of variation | 0.06 | 0.06 | 0.09 | 0.08 | 0.13 | 0.08 | 0.18 | 0.16 | ... | ... |
| Average absolute deviation | 1.1 | 1.0 | 1.6 | 1.2 | 1.7 | 1.3 | 2.6 | 2.5 | ... | ... |
| Japan | 34.8 | 32.4 | 31.3 | 30.5 | 30.8 | 32.0 | 32.1 | 32.0 | ... | ... |
| United Kingdom | 20.3 | 19.5 | 18.9 | 17.9 | 18.0 | 18.9 | 17.9 | 17.7 | ... | ... |
| United States | 15.2 | 13.9 | 14.5 | 15.9 | 16.9 | 15.3 | 17.2 | 15.9 | 15.6 | 16.2 |
| Sweden | 21.5 | 21.0 | 21.1 | 21.2 | 19.4 | 20.8 | 19.9 | 20.1 | 19.2 | 19.7 |
| Switzerland | 27.6 | 24.0 | 20.6 | 20.7 | 21.4 | 22.9 | 21.8 | 23.8 | 24.6 | 23.4 |
| Arithmetic average | 23.9 | 22.2 | 21.3 | 21.2 | 21.3 | 22.0 | 21.8 | 21.9 | ... | ... |
| Standard deviation | 7.5 | 6.8 | 6.2 | 5.6 | 5.6 | 6.3 | 6.0 | 6.4 | ... | ... |
| Coefficient of variation | 0.32 | 0.31 | 0.29 | 0.26 | 0.26 | 0.29 | 0.28 | 0.29 | ... | ... |
| Average absolute deviation | 5.9 | 4.8 | 4.0 | 3.7 | 3.8 | 4.4 | 4.1 | 4.8 | ... | ... |

Source: IMF, International Financial Statistics.^{1/} Weighted by real GDP (using 1980 weights in 1981).

Bibliography

1. IMF documents and publications

Communiqué on the Establishment of the European Monetary System - EBD/78/271, 12/6/78.

European Monetary System - A Paper for Discussion - SM/78/294, 12/15/78, and Supplement 1, 12/20/78.

The European Common Margins Arrangements ("Snake") - An Annotated Bibliography - SM/79/49, 2/14/79.

European Monetary System - Main Operational Features - SM/79/55, 2/16/79, and Correction 1, 3/14/79.

European Monetary System - Entry in Force - EBD/79/62, 3/8/79.

European Monetary System - Developments in 1979 - SM/80/22, 1/22/80.

European Monetary System - Realignment of Exchange Rates - SM/81/199, 10/23/81.

European Monetary System - Realignment of Exchange Rates - SM/82/135, 7/9/82.

Foreign Exchange and Financial Markets - monthly reports, various issues.

International Financial Statistics, various issues.

IMF Survey, 12/13/78.

World Economic Outlook, various issues.

Various EBDs in connection with realignments in September and November 1979, March and October 1981, February and June 1982.

J.J. Polak: The European Monetary Fund: External Relationships - DM/79/91, 12/10/79 (published also in: Proceedings of the Second International Seminar on European Economic and Monetary Union, Geneva, December 7-8, 1979, in: Banca Nazionale del Lavoro, Quarterly Review, September 1980).

Joanne Salop: The Divergence Indicator: A Technical Note, in: Staff Papers, Volume 28, No. 4, December 1981.

Horst Ungerer: The European Monetary System, IMF Survey, Supplement, 3/19/79.

2. Publications by the European Communities

Commission of the European Communities
Bulletin of the European Communities, various issues.

European Economy, No. 3, July 1979: The European Monetary System -
Commentary, Documents.

European Economy, No. 4, November 1979: European Monetary System:
The First Six Months.

European Economy, No. 10, November 1981: The European Monetary
System and Monetary Policy of the European Community.

European Economy, No. 12, July 1982: Documents Relating to the
European Monetary System.

Speech by Roy Jenkins, President of the EC Commission, Rome,
October 24, 1980: The European Monetary System: Recent Experience
and Future Prospects (distributed to Executive Directors as
EBD/80/303, 11/25/80).

Monetary Committee
Compendium of Community Monetary Texts, 1979.

Periodicals:

Annual Economic Reports.

Annual Economic Reviews
(excerpts from the Review 1980-81 have been distributed to
Executive Directors as EBD/80/304, 11/25/80).

Annual Reports on the Activities of the Monetary Committee.

Bulletins of the European Communities.

3. Publications by national authorities

Bank of England, Quarterly Review, June 1979:
Intervention Arrangements in the European Monetary System.

Banque de France, Service de l'Information, May 1979:
Le Système Monétaire Européen.

Banque National de Belgique, Bulletin, April 1979:
The Emerging European Monetary System, Papers and Proceedings
of the First International Seminar on the EMS held at Louvain-
la-Neuve, March 24-25, 1979; (Williamson, Lamfalussy, Thygessen,
et al; edited by Triffin).

Bulletin, July-August 1979: Le Système Monétaire Européen.

Central Bank of Ireland, Quarterly Bulletin, Autumn 1979:
A Guide to the Arithmetic of the EMS Exchange Rate Mechanism.

Deutsche Bundesbank, Monthly Report, March 1979:
The European Monetary System - Structure and Operation
(distributed to Executive Directors on April 24, 1979).

France, Ministère de l'Economie, Service de l'Information,
April 1979: Le Système Monétaire Européen.

United Kingdom:

The European Monetary System, Presented to Parliament by the
Chancellor of the Exchequer, November 1978.

Periodicals:

Annual, Quarterly, and Monthly Reports and Bulletins by EC Central
Banks.

4. Selected other publications

Benjamin J. Cohen:

The European Monetary System: An Outsider's View, Princeton
University, Essays in International Finance, No. 142, June
1981.

Michael Emerson:

European Dimensions in the Problems of Adjustment, in:
European Monetary System and International Monetary Reform,
Brussels, 1981.

Jean-Yves Haberer

Les problèmes de l'identité monétaire Européenne,
La Revue des Deux Mondes, March 1981.

Norbert Kloten:

Zur "Endphase" des Europäischen Währungssystems, in:
Internationale Anpassungsprozesse, Schriften des Vereins für
Sozialpolitik, Neue Folge Band 114, 1981.

Peter Ludlow

The Making of the European Monetary System, 1982

David Marsh:

Sterling and the European Monetary System, in: The Banker,
September 1979.

Rainer S. Masera:

The Operation of the EMS: A European View, in: Economia
Internationale, Geneva, November 1979.

Colin McCarthy:

EMS and the End of Ireland's Sterling Link, in: Lloyds' Bank Review, April 1980.

C. H. Murray:

The European Monetary System - Implications for Ireland in Annual Report 1979, Central Bank of Ireland.

Tommaso Padoa-Schioppa:

The EMS: Topics for Discussion, in: Proceedings of the Second International Seminar on European Economic and Monetary Union, Geneva, December 7-8, 1979, in: Banca Nazionale del Lavoro, Quarterly Review, September 1980.

Jean-Jacques Rey:

Les Techniques du Système Monétaire Européen, in: Aussenwirtschaft, June 1979.

Some Comments on the Merits and Limits of the Indicator of Divergence of the European Monetary System, in: Revue de la Banque, 1982.

Wolfgang Rieke:

Des Europäische Währungssystem, in: Deutsche Bundesbank, Auszüge aus Presseartikeln, March 17, 1980.

Franz Scholl:

Praktische Erfahrungen mit dem Europäischen Währungssystem, in: Probleme der Währungspolitik, Schriften des Vereins für Socialpolitik, Neue Folge Band 120, 1981.

Niels Thygesen:

Are Monetary Policies and Performances Converging? (with a comment by W. Rieke) in: The European Monetary System: The First Two Years, in: Banca Nazionale del Lavoro, Quarterly Review, September 1981.

Robert Triffin:

The European Monetary System and How it Fits into the International Monetary System, in: Economica, October 1979.

Roland Vaubel:

The Return to the New European Monetary System, in: Monetary Institutions and the Policy Process; Carnegie-Rochester Conference Series on Public Policy, Vol. 13, 1980.

Tom de Vries:

On the Meaning and Future of the European Monetary System, Princeton University, Essays in International Finance, No. 138, September 1980.

Pierre Werner:

Du Plan Werner au système monétaire Européen,
Bulletin de Documentation, March 3, 1980, Service Information
et Presse, Luxembourg.

Jacques van Ypersele

The Future of the European Monetary System,
in: Revue de la Banque, 1981.

Banca Nazionale del Lavoro:

The European Monetary System: The First Two Years, Proceedings
of the Fourth International Seminar on European Economic and
Monetary Matters, held at Danmarks Nationalbank, Copenhagen,
March 13-14, 1981 (R. Triffin, N. Thygesen, R. S. Masera,
P. Languetin, et al.), Quarterly Review, September 1981.

Institut d'Etudes Européennes, Université Libre de Bruxelles;

College of Europe: European Monetary System and International
Monetary Reform, Conference, June 4-6, 1981 (M. Emerson, G. E. J.
Dennis, V. J. Rapaz, J-J. Rey, R. S. Masera, et al, edited by
J. P. Abraham and M. Vanden Abeele), Bruxelles 1981.

U.S. Congress, Joint Economic Committee and Committee on Banking,
Finance, and Urban Affairs, U.S. House of Representatives.

The European Monetary System: Problems and Prospects, U.S.
Government Printing Office, Washington, D.C., November 1979.

The Brookings Institution, Washington, D.C.:

The European Monetary System: Its Promises and Prospects;
Papers prepared for a conference held at the Brookings
Institution in April 1979. (J. van Ypersele, M. Emerson, H.
Baquiast, R. Triffin, C. McMahon; edited by Philip H. Trezise).