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To: Members of the Executive Board

From: The Secretary

Subject: The Operation of Monetary Policy in European Economic and Monetary Union

Attached for the information of the Executive Directors is a paper on the operation of monetary policy in European Economic and Monetary Union. Conclusions appear on pages 26-29. This paper also provides background material to the paper on developments regarding European Economic and Monetary Union (to be circulated), which will be brought to the agenda for discussion on a date to be announced.

Mr. Enoch (ext. 35372) or Mr. Quintyn (ext. 34686) is available to answer technical or factual questions relating to this paper.

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INTERNATIONAL MONETARY FUND

The Operation of Monetary Policy in European
Economic and Monetary Union 1/

Prepared by the Monetary and Exchange Affairs Department
(In consultation with other Departments)

Approved by Manuel Guitián

August 24, 1995

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1/ This report is based largely on discussions held in a series of visits by Messrs C. Enoch and M. Quintyn of the IMF's Monetary and Exchange Affairs Department between April 24 and May 4, 1995 to the European Monetary Institute (EMI) and selected European central banks (the central banks of Belgium, Sweden, Italy, France, the United Kingdom, and Germany). During the visit to the EMI, the MAE team joined with members of EURI in a staff visit headed by Mr. J. Artus. Mr. J. Rosenblatt, of the Fund's Paris office, participated in the meetings with four of the central banks.

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I. Introduction

The Maastricht Treaty on European Union states 1/ that members of the European Union (EU) should decide before the end of 1996 whether the majority of member countries meet the specified convergence criteria to start Stage 3 of Economic and Monetary Union (EMU), and whether it is appropriate to enter Stage 3; if so, a date will be set for Stage 3 to start. If a decision to start EMU has not been taken by the end of 1997, the Treaty states Stage 3 should start, with those members that have satisfied the convergence criteria 2/, at the beginning of 1999. 3/ At the beginning of Stage 3 of EMU the currencies of participating members are irrevocably locked, and in time they are replaced by a single currency. This process will require from the outset that monetary policy is operated by a single monetary institution for the entire area of the monetary union.

The monetary authorities--the European System of Central Banks (ESCB)--will comprise the European Central Bank (ECB) at the center plus the various National Central Banks (NCBs) of the participating members. In order to prepare the monetary infrastructure necessary to operate policy in Stage 3, and to provide the ESCB with a menu of monetary policy instruments, the Maastricht Treaty provided that the European Monetary Institute (EMI) be established at the outset of Stage 2 of EMU in 1994. The EMI is working together with a series of sub-committees of the Council (of Governors) of the EMI, comprising experts in the various fields from all the NCBs, to specify the regulatory, organizational, and logistical framework necessary for Stage 3. The EMI itself will cease to exist and will be replaced by the ECB at the time when the decision is taken to move to Stage 3 of EMU.

This paper presents an overview of the current thinking in the EU with respect to the monetary policy framework for the future EMU. It looks at the monetary policy strategy to be deployed by the future ECB, the instrument framework needed to achieve the policy goals and the infrastructural needs for a workable monetary policy framework.

The paper is structured as follows. Section II describes the legal and institutional background against which the preparations for a single monetary policy are taking place. Section III discusses the monetary policy framework in general terms with regard to the targets, the relationship between targets and instruments, and the instrument framework. The next three sections discuss the selection and design of the instruments in detail: reserve requirements (IV), standing facilities (V), and open market operations (VI). Section VII deals with developments in the payment system, one of the critical areas for money market and monetary policy unification.

1/ Article 109j.

2/ Denmark and the United Kingdom have provisions to "opt out" of Stage 3.

3/ It has now been generally recognized that starting before 1999 is no longer feasible. However, this has so far apparently not led to any slippage in the Maastricht-determined timetable for the preparation of EMU, as discussed below.

In Section VIII the external policy issues are discussed and Section IX looks at issues regarding the operation of monetary policy in the transition from Stage 2 to Stage 3. Section X draws the main conclusions of this study.

Three appendices follow. Appendix I summarizes reserve requirement practices in EU member states; Appendix II summarizes EU member states' monetary policy strategies, instruments and procedures. Finally, Appendix III explains how the Bundesbank maintains a decentralized system for operating monetary policy in Germany.

II. Legal and Institutional Background

1. General overview

In line with the provisions of Article 109e of the Treaty of Maastricht, Stage 2 of EMU started on January 1, 1994. On that day, the EMI started operations (the NCBs, however, retain their independence from the EMI and are solely responsible for monetary policy in Stage 2). According to the Treaty and the attached Protocol on the Statute of the EMI, the latter's role is to contribute to the realization of EMU by preparing the conditions necessary for the transition to Stage 3.

Article 109f of the Treaty of Maastricht has given the EMI the responsibility to specify at the latest by December 31, 1996 (i.e., just before the earliest possible date for the start of Stage 3 of EMU) the regulatory, organizational and logistical framework necessary for the ESCB to perform its tasks in the third stage. This task covers *inter alia*: 1/

- the definition of the concepts and framework for conducting the single monetary policy and the preparation of the ESCB's operational rules and procedures;
- the implementation of a single foreign exchange policy;
- the promotion of efficient cross-border payments;
- the collection and harmonization, where necessary, of reliable and timely statistics to support the conduct of the single monetary policy;
- the supervision of the technical planning of the printing and issuing of an EU banknote; and
- the harmonization of accounting rules and standards of the NCBs and the setting-up of an adequate information systems architecture for the ESCB.

1/ European Monetary Institute (1995, page 62).

In pursuing these tasks, the EMI is assisted by several sub-committees and working groups. These consist of experts from NCBs together with secretariats of EMI staff. Thus far the following committees have been established: Monetary Policy Subcommittee; Foreign Exchange Subcommittee; Banking Supervisory Subcommittee; Working Group on EU Payments Systems; Working Group on Banknotes; Working Group on Statistics; Working Group on Accounting Issues; and Working Group on Information Systems. 1/

2. Preparatory work for Stage 3

The Maastricht Treaty lays down the Statute of the future ECB and ESCB and sets the maintenance of price stability as the new central bank's primary objective (Article 105 of Treaty and Article 2 of Statute). Both documents are less specific on the *modus operandi* of the future ESCB, and only set out a number of general principles. The most important are: the principle of open markets with free competition; a prohibition for central banks to finance public deficits and to buy government securities in the primary markets for government securities; and decentralization of the execution of the ESCB's operations so that recourse can be made to the national central banks "to the extent deemed possible and appropriate." 2/

Guided by these general principles, the respective subcommittees and working groups have started the technical preparations for Stage 3. These committees periodically report progress to the EMI Council which provides further guidance. However, as the view prevails that the EMI Council is legally not in a position to take any decision regarding the organization of the future ESCB and the framework for its operations, the EMI Council's work is largely limited to "creating consensus" in preparation for the transition to Stage 3. In other words, the EMI only prepares advice while decisions will have to be taken by the future ECB. The upshot of adopting this approach is that there will be a heavy burden on the ESCB during the first months of its operation: decisions will need to be taken on all aspects of its operations and lead times need to be allowed for to implement the necessary groundwork (in the ECB, the NCBs and the financial institutions) for the future monetary and exchange operations.

To date, the Monetary Policy Subcommittee has prepared a general overview paper on instruments and targets and separate papers on reserve requirements, standing facilities and open market operations. A paper on instrument frameworks is now under preparation. In general, work has

1/ Regarding bank supervision, Article 3 of the Statute of the ESCB stipulates that it "shall contribute to the smooth conduct of policies pursued by the competent authorities relating to the prudential supervision of credit institutions and the stability of the financial system." The precise role of the ESCB on supervisory matters has yet to be determined.

2/ Regarding existing central bank holdings of government debt, a Council Regulation of 1993 (3603/93) states that all outstanding government debt toward the central bank is to be of fixed maturity. This conversion into fixed maturity debt has been completed in most EU countries.

progressed much more on instruments than on targets of monetary policy. Within the Working Group on Payments Systems a Task Force on gross settlement systems has made significant process in developing a plan to integrate the national real time gross settlement systems.

3. Underlying assumptions for a uniform monetary policy

A uniform or single monetary stance in the EU countries participating in the EMU could be defined as the *equality of interest rate levels in the EMU interbank market* (the market where banks trade cash balances held at the central bank). A uniform monetary policy is incompatible with local differences in this rate.

To achieve a single monetary policy stance in the EMU it is considered necessary that (a) the *formulation* of monetary policy be centralized; 1/ (b) the instruments and techniques of monetary policy be harmonized so that monetary policy signals be uniform across countries; and (c) sufficient possibilities for EMU-wide¹ arbitrage are available to the financial institutions. Financial institutions must be in a position to transfer funds across national borders freely and on the same day. Without this possibility, interest rate changes will not be transmitted quickly and uniformly throughout the Union and interest equalization will not be achieved. Requirement (c) can only be met when a Union-wide payment, clearing and settlement system supports transactions in the wholesale markets, at a minimum, and these wholesale markets are integrated.

Thus, a unified monetary policy consists of three pillars: unified monetary policy formulation, integrated money markets and an integrated payments infrastructure (at least for the wholesale markets). The EMI and the NCBs are focussing primarily on elements one and three. The integration of money markets is expected to follow from the establishment of a pan-EMU payments system and the introduction of the single currency. Studies are currently being undertaken to compare the transmission mechanisms of monetary policy actions in the member countries. It is to be expected that the different stages of development of the national financial markets will point to differences in speed and efficiency of the transmission mechanism. However, such differences are not expected to interfere with a unified monetary policy. Instead, financial integration in the EU would be expected to gain speed as a result of monetary integration, thereby gradually eliminating differences in the transmission mechanism.

1/ As will be discussed later, *implementation* of monetary policy can to some extent be decentralized. However, with centralized formulation of monetary policy, there will also be centralized determination of the profits of the ESCB. Under the Maastricht Treaty these profits will be allocated to the NCBs of the participating countries according to a formula in which each NCB's share is 50 percent weighted according to its country's population and 50 percent according to its GNP.

III. The Monetary Policy Framework

Preparations regarding the instruments and payments system for Stage 3 are being carried out in advance of decisions regarding the use of an intermediate target in Stage 3. While there is some awkwardness in this sequencing, it is not generally regarded as a major hurdle to the preparatory work. Price stability has been defined as the principal objective of monetary policy in the EMU, but decisions remain to be made regarding the intermediate target: will an intermediate target be used, and if so, which variable will be selected, or will the policy framework focus directly on an inflation target?

The selection of a monetary policy framework, and more particularly of an intermediate target for the ECB, is linked to the issue of establishing credibility for the ECB as quickly as possible. Whether credibility can be "inherited" from its parent monetary authorities, or whether it will largely have to be earned, has yet to be seen. Considerations in this regard underlie arguments that instruments and targets in Stage 3 should be based in their design in some considerable measure on the existing procedures of the more successful EU central banks. However, such arguments have to be balanced in the light of recent and prospective developments in monetary and financial markets more generally, to ensure that the monetary system is able to respond efficiently and effectively to the financial environment in prospect for the next decade.

1. Targets and instruments

At present, a variety of targets is being used by EU members. Germany has had a monetary targeting framework since the mid-1970s. Other countries including France, Spain, and the United Kingdom have over time downplayed the role of monetary targets. To achieve the objective of price stability, the Banque de France has an external intermediate objective-- stabilization of the value of the franc against the most credible currencies in the ERM. The Central Bank also has a medium-term (domestic) intermediate objective, expressed in terms of M3. Spain and the United Kingdom have adopted inflation targets. Finland and Sweden also use inflation targets, while most other EU countries rely on targeting the exchange rate. 1/

While some work has been conducted into the development of a harmonized broad money target, 2/ it remains to be seen whether in Stage 3 the ECB will make use of an intermediate monetary target or will target inflation directly. Arguments in favor of the latter include the breakdown

1/ Austria, Belgium, Denmark, Ireland, Italy, the Netherlands, and Portugal target the exchange rate as part of their commitment to the ERM. Greece has a nominal exchange rate target, albeit with a pre-specified rate of crawl. Spain, as noted above, has an inflation target while being a member of the ERM. Finally, Luxembourg is part of a monetary union with Belgium.

2/ See, for instance, Committee of Governors (1993).

of monetary relationships in many countries undergoing financial innovation, and the uncertain nature of the monetary relationships in the early days of EMU. On the other side, the perceived success of the German monetary targeting approach might give added credibility at the outset to the ECB if it adopts a similar framework; also some recent studies of money demand relationships have tentatively shown a stable money demand at an aggregate European level. 1/ In addition, inflation targeting is relatively untested, and therefore may be thought unsuitable at the outset of policy operations of a new monetary institution. Moreover, the monetary policy inflation linkage might also be made uncertain by EMU. There would probably need to be considerable discussion of the appropriate design of an inflation target, including the measure of inflation, if it were decided to adopt such an approach. 2/ 3/

There seems to be agreement that in either case the operating target would be the short-term interest rate, and there is a general feeling that an inflation target and a money target could therefore be operated with essentially the same set of monetary instruments. Indeed, a number of EU countries have shifted from one to the other in recent years without this of itself leading to a fundamental change in monetary instruments. Other potential targets of monetary policy--such as the exchange rate--might require different monetary techniques for their achievement, but since at the moment these seem unlikely to be assigned a central role, they are not featuring to any degree in considerations on the choice of monetary instruments. 4/

The choice of the short-term interest rate as operating target would be in line with current practice in all EU members and in other industrialized countries. Using the monetary base as the operating target is generally seen as less desirable in the EMU preparatory work because of the volatility it is perceived to induce in interest rates. The frequency of intervention to influence the interest rate, and the degree of precision

1/ See, for instance, Kremers and Lane (1990), Artis, Bladen-Hovell and Zhany (1993), Monticelli and Strauss-Kahn (1993) and Cassard, Lane and Masson (1994).

2/ The design of the targeting framework may also be influenced by the various studies that will be conducted over the coming year on the transmission mechanism in the EU membership.

3/ It has also been argued that the two approaches are not mutually exclusive to the extent that the time horizons attached to the respective targets may be different.

4/ EU members vary in the extent to which they explicitly monitor complementary indicators, e.g., asset price inflation, in addition to the official intermediate targets. The EMI Annual Report states that, irrespective of whether monetary or inflation targeting is adopted, there will be a need to monitor other indicators; however, the possible role of such complementary indicators has so far not been the focus of much discussion.

with which the interest rate will be managed, will depend on the overall design of the monetary instruments, which in turn will reflect both technical considerations and more general, broader perspectives.

2. Criteria for selecting instruments

The Maastricht Treaty and the Statute of the ESCB have put forward a number of criteria to guide the choice of the monetary instruments:

- efficiency and effectiveness: instruments, taken individually and as a set, should be efficient and effective in achieving the targets;
- market conformity: all instruments should operate on market-based principles;
- equal treatment with respect to all countries and groups of financial institutions that have access to the ESCB;
- simplicity and transparency in support of the other criteria;
- decentralization: while the formulation of monetary policy must take place at the center, NCBs should be used as much as possible in implementation; and
- continuity in the transition to the new operational framework, for instance through reliance on existing infrastructure.

In addition, understanding needs to be reached on some underlying issues:

- the structural position of the banking system vis-à-vis the ESCB. Will the banks have a permanent shortage of funds so that they have to rely on the central bank for liquidity or, if not, should the instruments be designed in such a way that a shortage is created?
- should the system be expected to stabilize itself within limits, or should the ESCB be in the market frequently to guide and manage the system? In the former case, the focus of instrument design should be more on establishing these limits, and on seeking self-stabilization properties for the system within these limits.

Related technical issues include:

- the relative importance of the various functions in operating monetary instruments--steering of interest rates, signalling, liquidity provisioning and bounding; and
- the number and type of counterparties and selection of collateral.

Among these principles, that of decentralization deserves some more attention. It is generally accepted that monetary policy *formulation* in the EMU must, by definition, be centralized. The discussion, therefore, concentrates on the degree at which the actual *implementation* can be decentralized. The main argument in favor of decentralization is basically that the NCBs' knowledge of the local financial markets will enable more effective implementation of monetary policy at the NCB level. In addition, there is a desire to maintain a role for the NCBs in this regard because of perceptions that there is a linkage between the monetary operations of an NCB and prospects for financial markets in the country of the NCB.

Decentralization can be applied in varying degrees to the respective instruments. Management of reserve requirements and standing facilities can more easily be operated on a decentralized basis than can open market operations, although these can be decentralized too. Appendix III provides details of the Bundesbank's decentralized handling of open market operations.

3. Likely instrument framework

As the EMI is not in a position to make the decisions on the monetary policy instruments that will be used, it is at this stage preparing a "menu" of possible instruments for the ESCB to use in Stage 3.

Work has divided the instruments into three types: reserve requirements; standing facilities; and open market operations. It is agreed that, if reserve requirements are to be used, they will be largely for the management of structural liquidity, and not to fine tune liquidity. The main instrument for this latter purpose will be open market operations (OMOs). The main technique of intervention is likely to be the repo, although outright transactions will not be precluded.

An important strategic issue to be resolved is the frequency of intervention. In one stylized model, interest rates are pegged very narrowly, there is little use of self-stabilizing properties in the system, and the ESCB will be frequently in the market to achieve the interest rate target. In another stylized model, the authorities set a corridor within which interest rates can fluctuate--generally by introducing a Lombard facility, which becomes the top of the corridor, and a discount facility, which becomes the floor--and they seek to introduce self-stabilizing properties into the system so that discretionary interventions in the market need be made only rarely.

The former approach is supported on the grounds that it provides the monetary authorities with the most powerful tools to guide interest rates, that frequent involvement in the markets serves to enhance the interactions between the authorities and the markets, that modern information techniques make such a system transparent and efficient, and that it imposes the lowest cost on the banks. Detractors of this approach argue that the authorities may cloud market signals by such frequent interventions in the markets; that

the introduction of self-stabilizing properties removes the need for frequent discretionary interventions; and that reliance on such instruments also permits a greater degree of decentralization in the operation of the monetary instruments.

A key concept in the comparison of these two stylized models seems to be the importance attached to so-called "self-stabilizing properties". In the latter model above, the market is given more room to set the interest rate and, thus, to stabilize the system. Of course, the narrower the corridor, the less leeway the market has and the more such a system will resemble the pegging system where the central bank intervenes more to "stabilize" the system. In other words, the issue of frequency of intervention mainly reflects the attitude of the central bank to the respective roles of itself and the markets in stabilizing the system.

In practice, NCBs operate within the continuum between the two extreme models. For instance, even where--as in Germany--the Central Bank maintains a corridor for interest rates, it is not always indifferent to the position of interest rates within the corridor, and indeed operates to manage movements within the corridor. On the other side, even those operating permanently in the markets make considerable efforts to ascertain "underlying" market conditions--for instance, the market response to the Central Bank's own interest rate actions, or the behavior of market interest rates further along the yield curve.

Nevertheless, differences of approach remain, and consensus is yet to be established on a number of specific issues. Among these perhaps the most important are: (i) the role of reserve requirements; (ii) the need for a rediscount mechanism (or more generally a mechanism for basic refinancing); and (iii) the degree of decentralization for the implementation of each of the instruments.

IV. Reserve Requirements

At present, 10 EU members maintain reserve requirements for monetary policy purposes (see Appendix I). The ratios range from 0.5 percent on non-sight deposit liabilities in France, and around 1-2 percent on eligible liabilities in several other countries, to 15 percent in Italy. ^{1/} The size of the deposits thereby required ranges from 0.1 percent of GDP in France to 4.3 percent in Greece and 6.7 percent in Italy; mostly it is between 1 and 2 percent of GDP. The required reserves are remunerated in only four countries, and in only two of them (Ireland and the Netherlands) is remuneration close to market rates. In recent years, reserve ratios have been reduced in several EU countries, as indeed in a number of industrial countries more generally.

^{1/} In the UK the reserve requirement (0.35 percent of deposits) is intended to meet the costs of the central bank rather than as a monetary policy tool. In Greece the 100 percent redeposit requirement on foreign currency deposits (recently reduced to 70 percent for most foreign currency deposits) is maintained for debt management rather than monetary policy purposes; the rate on domestic currency deposits is 9 percent.

1. Purpose of reserve requirements

Reserve requirements basically fulfill two monetary functions--a monetary control function and a money market management function. 1/ It seems that most EU members at the moment regard the market management functions as the more important.

As a monetary control device, not (fully) remunerated and relatively high reserve requirements drive a wedge between yields on monetary and non-monetary assets which increases the interest elasticity of the demand for money and enhances control over the money supply since a given desired change in money can be achieved through a smaller change in interest rates. In addition, reserve requirements increase and stabilize the money multiplier, thereby assuring a stable link between the monetary base and the money stock. The money market management function consists of inducing or enlarging the banks' demand for reserves and, when averaging provisions apply, limiting the effect of daily reserve fluctuations on money market interest rates. 2/ Less volatile money market rates, in turn, reduce the need for frequent central bank intervention.

As noted above, however, there is a widespread trend to lower reserve requirements. This reflects increasing recognition of the implicit tax in unremunerated reserve requirements, and the resulting impact on encouraging disintermediation from the banking system. With financial deregulation the scope for such disintermediation, including offshore, has been growing. Moreover, information system advances mean that a number of monetary authorities consider that active use of OMOs can achieve most of the advantages of reserve requirements without incurring the concomitant disadvantages.

The Bundesbank in particular stresses the advantages of maintaining reserve requirements. In part this may reflect the fact that near-substitutes to bank deposits, including liquid short-term money market instruments, have been slower to develop in Germany than in some other EU

1/ In addition, reserve requirements may be considered useful as a buffer against problems related to payments and settlement. A further traditional function of reserve requirements for banking supervision purposes, is now not generally seen as useful, as reserve requirements have been superseded by more sophisticated prudential instruments.

2/ The averaging of reserve requirements is often explained in terms of enhancing, the self-stabilizing properties of the system. However, while averaging provisions may have a stabilizing effect during the holding period, there can nevertheless be substantial interest rate volatility at the end of the holding period when banks have to adjust their balances at the central bank.

countries. 1/ The taxation element implicit in reserve requirements is not seen as necessarily a disadvantage, since taxation of the banking system is of itself not necessarily a distortion and indeed may enhance overall social welfare. 2/ 3/

In addition, as the Bundesbank continues to maintain a monetary target, it is particularly concerned to have available the monetary control capability of reserve requirements. If the ECB adopts a monetary target, monetary control arguments for reserve requirements are likely to be given some prominence. For those countries that have reduced their reliance on reserve requirements on the grounds that such an instrument is costly in the modern financial market environment, a decision to reverse this process could be especially problematical.

2. Design of the reserve requirement

The differences in viewpoint on the role of reserve requirements has implications for the design of the instrument. If much weight is placed on the monetary control function, the ratio should be significant, and the reserves should not be (fully) remunerated. On the other hand, the market management function can be fulfilled with a relatively low rate (perhaps even zero, see below), and there is no monetary reason preventing the authorities from remunerating these reserves.

Other issues in the design--such as the calculation base, the calculation period, and maintenance period (there appears to be a broad consensus that one month is appropriate) do not seem to raise great problems in the discussions. 4/ The base (the bank liabilities to which the ratio applies) is likely to be determined in line with the monetary target, if there is such a target. However, a discussion is still going on as to whether the reserve requirement should apply only to credit institutions as defined in the First Banking Directive--those institutions both accepting

1/ However, there has been a considerable outflow of deposits from the German banking system into Luxembourg, which is generally considered related to the reserve requirements in Germany.

2/ See, for instance, Walsh (1984).

3/ However, it may be worth noting that the Bundesbank's argument in favor of taxation is inconsistent with arguments justifying reserve requirements on the basis that the tax imposed by required reserves is compensated by the interest rate subsidy granted under the Bundesbank's rediscount mechanisms.

4/ If much weight is placed on the monetary control function, the requirement should be as nearly contemporaneous as possible. For the market management function, the length of the lag is of much less importance.

deposits and extending credits 1/--or to a wider range of financial institutions that would include also mutual funds and, in some countries, postal financial services.

In order to achieve the benefits of a reserve requirement system while limiting the drawbacks, reserve requirements could be averaged around zero. Such a system would in some ways follow arrangements introduced in Canada. Appropriate collateral would be needed to cover times during the holding period when banks' accounts would have negative balances. However, this level of reserve requirement would be, by definition, ineffective at creating a demand for reserves.

A further refinement would be the securitization of part, or all, of reserve requirement balances. Issuing central bank securities to mop up excess liquidity as an alternative to an increase in the reserve ratio was tried by the Bundesbank in 1993, to absorb the domestic impact of capital inflows. 2/ Central bank securities have also been issued in Denmark, Spain, and Sweden.

3. Issues regarding decentralization

Substantial scope exists for decentralization of reserve requirement *management*. 3/ Account management and monitoring, and levying of penalties in case of shortfalls, can be the responsibility of the NCBs for the financial institutions located on their national territory.

One issue in this connection is the degree to which a commercial bank can decide in which country it will maintain its required reserves. Some may choose to keep their required reserves in the country of the head office, others in that of their treasury operations, and others in the country where they conduct most of their monetary operations (if these differ). Uniformity of reserve requirements across countries will reduce the incentive for commercial banks to micro-manage the location where they satisfy their reserve requirements; and, from the central banks' perspective, Maastricht Treaty provisions for the sharing of profits between NCBs may make them relatively relaxed about the distribution of required reserve holdings. Nevertheless, some may be concerned that freedom to choose where banks can maintain their reserve requirements could lead to a

1/ "Credit institution means an undertaking whose business is to receive deposits or other repayable funds from the public and to grant credit for its own account" (First Banking Directive, Article 1).

2/ The use of this mechanism was not judged a success, and the securities have been allowed to run down at maturity, reportedly because they were purchased largely by external investors--including central banks--and so did not effectively satisfy their function of reducing domestic liquidity.

3/ Decentralization in this case refers only to the management of the accounts by the NCBs. The level of the requirement and its features need to be uniform across the union.

shift to those centers where relatively large amounts of financial business are undertaken, and thereby perhaps enhance the shift toward these larger financial centers.

V. Standing Facilities

Standing facilities, defined as facilities for the commercial banks that can be activated at their discretion, play an important part in the armories of most EU central banks, and are likely to play an important part in the ESCB's monetary instrument framework.

1. Types of standing facilities

Basically three types of standing facilities can be distinguished: (i) marginal lending facilities at above market rates; (ii) lending facilities close to or below market rates; and (iii) deposit facilities. The use of a marginal lending facility is more widely spread throughout the EU (used by 10 central banks) than the two other facilities. Deposit facilities are used by six central banks and lending facilities at below market rates also by six central banks (see Appendix II).

2. Establishing an interest rate corridor

Combining standing facilities to establish a corridor for guiding interest rate movements in the future EMU seems to have considerable support among the member countries. At the moment, eight EU central banks use such a corridor in conducting monetary policy. Supporters argue that the corridor performs a particularly clear *signalling function* with respect to the stance of monetary policy. Changes in the rates on standing facilities generally signal a substantive policy change, while changes in interest rates deriving from open market operations may rather reflect day-to-day developments, and indeed in some cases technical factors not related to monetary conditions at all.

While there seems to be a general consensus about the upper boundary (a Lombard facility), other issues have not yet been resolved. Among these are the type of facility that will function as the lower boundary and the width of the band. Related to the first of these is the issue of interest rate subsidies if a facility is established which provides finance to the banks at below-market interest rates. Additional issues include the maturity structure of the facilities, the need for a quota system, counterparties, and collateral. ^{1/} More fundamentally, there remains the question whether the corridor needs to be bounded at both sides: some consider that a Lombard facility alone could provide adequate signalling to the market, while the lower bound can be ensured by appropriate OMO.

^{1/} There is general consensus that the management of standing facilities can be decentralized to the NCBs.

3. Nature of the lower boundary

In some EU countries the *lower bound* is formed by a discount facility, while in others a deposit facility serves as the floor. 1/ The combination of a Lombard and a deposit facility provides a symmetrical arrangement to clear the interbank market at the end of the day; liquidity can be injected at the ceiling rate and absorbed at the floor rate.

A discount mechanism has somewhat different features from a deposit facility. For instance, while a deposit facility generally operates overnight, it may well take longer for the banks to unwind their positions with a discount mechanism. Thus the latter is not always a floor for the overnight market rates, but rather for longer maturities, depending on the maturity of the underlying paper.

Related to the choice of a lower boundary mechanism is the role of *interest subsidies*. Lower-bound lending facilities typically involve a subsidy to the banking system, an issue that has raised some controversy in the discussions regarding the EMU. In Germany it is argued that the subsidy compensates for the unremunerated required reserves, 2/ while in the Netherlands subsidized lending and reserve requirements are specifically designed in such a way that they have a neutral effect on bank profitability.

Related to the interest rate subsidy debate is the question regarding the need for a *basic refinance* instrument. In Germany the discount mechanism provides such basic refinancing to the financial sector and is considered an integral part of the Bundesbank's framework. 3/ In principle, such a facility could operate without a subsidized interest rate. Other techniques too could be used to provide basic refinancing. For instance, with present-day techniques, open market operations could fulfill basic liquidity needs, or the ECB could organize regular auctions of central bank credit (against collateral) to provide basic refinance. These issues are still under discussion.

4. Width of the corridor

The *width of the band* varies considerably across EU countries and over time. Currently bands are as wide as 400 basis points in Finland and

1/ One country (Belgium) that relies on a deposit mechanism as the floor, also operates a separate discount window. The latter however, has no real monetary policy function.

2/ It should be noted, however, that the incidence of the reserve requirements and of the discount subsidy will not generally be the same across banks.

3/ The decentralized nature of the operation of this facility is described in Appendix III.

as narrow as 150 basis points in Italy and Germany. 1/ The width of the band has consequences for the intensity of the central bank's presence in the market and for the depth of the money markets. At present, there seems to be broad support for a fairly wide band, as this would reduce the frequency with which the central bank would need to intervene through open market operations, as well as the frequency of recourse by the commercial banks to the central bank's standing facilities. In such conditions, money market fluctuations would generally be resolved within the market, and banks would not come to the central bank on a routine basis.

5. Other features

The *maturity* of the standing facilities largely determines at which point of the yield curve the central bank can exert its influence. While most deposit facilities are overnight, there is a larger variety in the lending facilities offered by the EU central banks. Lending at penalty rates is usually, but not exclusively, overnight; lending at below market rates tends to be between two weeks and four months.

Facilities for lending at a penalty rate and accepting deposits at a low rate both have a built-in price mechanism that will limit recourse. Only in the case of a lending facility at below market rates is a quota system needed to limit demand: quotes could be based, for instance, on indicative ranges set by the ECB on the basis of a bank's capital, with specific shares for individual institutions determined by the NCBs on the basis of detailed balance sheet criteria.

Traditionally, standing facilities, particularly central bank lending, are closely related to the central bank's function of *lender of last resort*. This function is not mentioned explicitly in the Statute of the ESCB. 2/ The understanding seems to be that in case of emergencies NCBs are likely to perform their traditional role in this regard, but moral hazard concerns are likely to limit their involvement, and to make NCBs wary of making any commitment explicit in advance. Under EMU, new issues regarding the lender of last resort function may emerge. The principle of remote access (see below) may imply that a NCB may have to function as the lender of last resort for a financial institution outside its national territory. Likewise, if the hours of operation of the payment system are not harmonized, the central banks that are open latest could become the *de facto* lenders of last resort for the entire system. 3/

1/ Since the beginning of the 1990s, the band has varied between 100 and 250 basis points in Germany.

2/ By the same token, there is also nothing in the Statute to preclude such a function.

3/ This need not be a problem, given the principle of profit-sharing among NCBs.

VI. Open Market Operations

There is a general consensus that OMOs will be the key instrument in any steering of day-to-day developments in the money markets. There seems also to be broad agreement with respect to the general principles governing the ESCB's OMOs. Nevertheless, issues such as collateral, counterparties and remote access--which pose few problems of principle--have thrown up various technical issues that remain to be addressed.

1. Types of open market operations and techniques

In some EMU discussions it has been found helpful to divide OMOs into two types: regular OMOs, i.e. those that will take place at pre-specified intervals (e.g., weekly or bi-weekly), and fine-tuning OMOs which could be done at any time, according to the short-term liquidity position of the Union. There seems to be broad consensus that repos (or reverse repos) should be preferred to outright transactions although the latter are unlikely to be completely precluded. Not only do repos provide more flexibility to the central bank with respect to the maturity of its interventions, and reduce the impact on the market prices of the underlying securities, they also circumvent more easily potential problems that might otherwise arise with respect to the choice of eligible paper--a problem that could be particularly significant during the transition period when securities denominated in national currencies will still dominate EMU markets. Flexibility is likely to be given to the choice of underlying paper: government securities, private paper, as well as central bank securities, if issued, could be used. There is also a common view that price and volume tenders could be organized according to the circumstances.

The ECB is likely also to have additional techniques at its disposal, although this of itself does not mean that they will be used. Foreign exchange swap transactions will probably be among such techniques, and so will collection of fixed-term deposits from financial institutions--a form of paperless open market operation.

2. Collateral for open market operations

The Statute of the ESCB stipulates that all the ESCB's transactions with financial institutions need to be collateralized. The discussions on the types of collateral are at a relatively early stage. One idea is to establish a "common pool of collateral" based on minimum criteria which securities would have to meet. The choice of collateral is also related to the design of an EMU-wide securities settlement application, about which discussions in the designated working party are still at an early stage.

3. Decentralization of open market operations

The issues of decentralization, counterparties and remote access are to some extent intertwined. There seems to be growing support for a decentralized execution of OMOs, so that the ESCB can take advantage of the

knowledge of each NCB of the local markets and its familiarity with local institutions. Thus, under the instructions of the ECB, the NCBs would organize the tenders, transmit the bids to the ECB, announce the results, and settle the transactions with the financial institutions. Decentralization of these operations is likely to be easier with price tenders than with volume tenders because the latter could require specification of a quota system.

It seems agreed that decentralization of regular OMOs would imply the involvement of each NCB. While fine-tuning OMOs could also be decentralized, the ECB could use one or a selected number of NCBs to execute such operations. Over time not all central banks might continue to participate; certain NCBs could become specialized agents. This could also imply that certain financial centers became gradually specialized in certain types of securities or operations, and that the ECB would largely go through these centers according to its needs. The speed with which such specialization might occur would depend, at least in part, on the relative frequency of the regular and the fine-tuning OMOs. Since the existence of a "corridor"--as discussed in the section above--would reduce the need for frequent fine-tuning OMOs, it is argued that this would ensure that the great majority of OMOs would be likely to be conducted on a universal basis, and that any tendency towards concentration of OMOs on a few central banks could be avoided.

4. Counterparties for open market operations

At present some EU central banks conduct their OMOs through a limited number of counterparties (primary dealers, discount houses), while a larger number of central banks deal in principle with all financial institutions that have an account at the central bank. Based on the principle of equal treatment laid down in the Statute of the ESCB, there seems to be broad agreement in favor of using the widest possible range of counterparties.

As discussed earlier, there are two possible definitions of financial institutions--"credit institutions" according to the First Banking Directive or the wider definition of "monetary finance institutions" which includes a much wider range of financial institutions. It is generally agreed that only those institutions subject to reserve requirements should be allowed to act as counterparty to the central bank in OMOs. One suggested scenario is that regular OMOs could be conducted with a wide range of financial institutions, while a smaller number would be involved in the fine-tuning operations.

Whatever the definition of the eligible counterparties, there is also the issue of counterparties with "remote access," i.e., whether an NCB can be accessed by an EU bank which does not have an account with it. Traditionally, NCBs have worked only with financial institutions located on their national territory. However, one of the principles underlying the single financial market in the EU, as stipulated in the Second Banking Directive, is that all banks recognized in one member state are authorized

to do business in all member states. This implies that all financial institutions could participate in auctions organized by central banks in other countries. With modern information systems now in place throughout the banking community, there is no technical reason to preclude such activity. This issue, and the various resulting issues (granting of intra-day credit to remote banks, for instance) still have largely to be addressed. One view is that, while the principle of remote access has to be accepted according to the principles of the single market, central banks should create such an environment that there would be little reason for banks to request remote access.

While OMOs will undoubtedly play a principal role among the monetary instruments of the ECB, the degree of ECB reliance on them is still to be resolved. On the one side, if interest rates are allowed to fluctuate freely within a corridor, the role of OMOs may be relatively limited, although, even under those circumstances the central bank may wish to affect the rates within the corridor. On the other side, without a corridor in place, monetary management could rely exclusively on OMOs. Those supporting this latter approach stress the efficiency and strength of OMOs; those wishing to rely more on reserve requirements and standing facilities, however, are concerned that heavy reliance on OMOs would be over-intrusive and distort market signals. 1/

5. NCBs as fiscal agents and bankers to their governments

Finally, one interesting related issue is the central banks' role as fiscal agent and banker to the government. One traditional function of central banks, that of extending credit to the government, is prohibited under the Maastricht Treaty. 2/ It has become recognized, however, that for those central banks where governments have sizeable deposits, rapid reductions in those deposits would have a similar effect to increasing lending on overall liquidity. There is thus increasing caution over a central bank's general financial involvement with the government.

Neutralization of the effects of daily government cash flows on liquidity in the financial system is one of the main concerns of central banks and one of the reasons for fine-tuning open market operations. In the EMU such neutralization would involve communication by the NCBs to the ECB of their respective government's cash flows for the day. These flows would be smoothed out throughout the Union.

1/ Views on this last issue clearly differ. Some argue that frequency of intervention is no indication of over-intrusiveness, and that it would indeed be the maintenance of reserve requirements that would be unnecessarily intrusive.

2/ This prohibition is already in effect as from stage 2 of EMU, except for the United Kingdom, which has a derogation in this regard.

In some countries there is a tendency toward a more complete divorce between central bank and government. ^{1/} This seems to be related as much to the general trend to central bank independence as to the monetary integration in Europe. In Sweden for instance, the Government only has a transactions account at the Riskbank, and there is an arrangement in place that ensures that its balance at the end of the day is always zero. All government deposits are held with commercial banks. In Germany, the Bundesbank no longer performs the role of government banker, while in France the Government is exploring alternatives to banking with the Banque de France. If this tendency of diminishing the central bank's role as banker to the government continues, the direct impact of government cash flows on reserve money will diminish, in turn reducing the likely need for frequent fine-tuning open market operations.

VII. Payment System Requirements

In a monetary union, monetary policy is set by a single monetary authority. Monetary signals must therefore travel smoothly across the Union, and money market interest rates must be uniform across the Union. An important element of the preparations for monetary union has therefore been the construction of a payments system which can ensure a unified money market, and hence the required pan-Union uniformity of money market interest rates. The payments working group has had one of the most intensive work programs of any of the sub-committees and working groups preparing the monetary infrastructure of Stage 3.

A minimum requirement to achieve pan-Union uniformity of interest rates is that settlement of large-value cross-border transactions, in particular those associated with the ESCB's operation of monetary policy, can be made on a same-day basis. This requirement is to be achieved by a two-stage approach: first, the creation of national large-value payments systems with certain defined conditions, and then the interlinking of these system.

Each NCB is committed to introducing a large-value real-time gross settlement system (RTGS) with a target date of end-1996. It is at present expected that all but two will achieve this deadline. The pan-Union payments system will thus depend on the interlinking of these national systems; given the relatively short time available to have the systems in place, it was not feasible to create a fully harmonized system at the national level, since this would for instance have required the replacement of the computer systems in many of the EU central banks. Nevertheless, interlinking the national systems requires harmonization of the national systems in various ways, including access criteria, pricing structures, and opening hours. Progress in this regard has so far been mixed.

^{1/} Further discussion of the relationship between central banks and governments is contained in Cottarelli (1993).

The development of national RTGSs is involving considerable expense in most of the NCBs. At the start of this process, only the Scandinavian countries had RTGSs in place that are suitable for the purposes of the monetary union. In other countries, even where gross settlement systems were in place, they have had to be completely redesigned. Development has reportedly been accelerated for some of the smaller NCBs by their taking for themselves the same outside contractor that was involved in designing the software for one of the larger NCBs.

With considerable progress having been achieved in developing the national RTGSs, work is under way in developing an interlinking system, denoted the Trans-European Real-Time Gross Settlement Express Transfer (TARGET) system. This system will link the various NCBs, and through them the participants in the national RTGSs. 1/

Work has been intensive in designing the functions of the TARGET system, and those involved are confident that it will meet the end-1996 deadline for completion. A number of issues, however, remain to be resolved: these can be divided into those that are technical and those that are policy related (the two are not always easy to distinguish).

Among the former is the question of how long a delay between instigating a transaction and final settlement is acceptable. While it is clear that the system can generally settle more quickly than end-of-day, there is bound to be at least a minor delay before actual settlement occurs; thus it will in reality be a near real time system. Expenses in designing the system rise rapidly the shorter one tries to make this delay. On the other hand, the greater this delay, the more there may be a risk of payments failure, and also the greater the need for collateral to meet intra-day obligations. Indeed, if the period of delay becomes significant, issues such as the method of queuing for payments settlement, and of intra-day limits become relevant.2/ It has not yet been possible to reach clear decisions in this regard. A related issue is likely to be whether any reserve requirements held in the system will be simply blocked funds, or whether they will be available to meet intra-day collateral obligations.

Similarly, it is not possible to say at this stage what the actual monetary policy instrument mix of the ESCB will be. Thus the system is being designed to be able to accommodate the menu of possible instruments,

1/ TARGET will provide competition both to the existing private ECU clearing system, and to correspondent banking relationships. The degree of competition will depend upon the range of services it offers, as well as its pricing structure.

2/ RTGS systems are delivery versus payment, so an individual transaction will not carry a credit risk. Given that an institution is likely to be making a series of payments, however, there is a possibility of intra-day overdrafts in the event of delays in effecting the transactions made first.

in particular pan-Union OMOs of various types. Again, lack of decisions in this area is likely to be leading to extra expense in creating a system with excess flexibility.

The TARGET system will be designed to operate only in the single currency. It is becoming increasingly accepted however that at the start of Stage 3 there will still be a role (possibly a central role) for the national currencies (although by definition their parities will be irrevocably fixed). The issue then arises how the system should cope with the multiple currencies during this transitional period. The preferred solution seems to be that the system will convert the national currencies into the single currency at the outset of the transaction, and will convert back at the end; this arrangement would be considerably less complicated than seeking to run a multiple currency system.

It is agreed also that the TARGET system will be available to all member NCBs, even if their country does not join the EMU, whether through exercise of the opt-out provision available to Denmark and the United Kingdom, or because the country fails to meet the convergence criteria. This agreement recognizes the considerable efforts and expenses already put into the creation of the RTGSs by all member states, and the fact that a state-of-the-art large value payments system is an infrastructural innovation that should be used to benefit the competitiveness of the EU as a whole. It also recognizes the fact that the number of countries in EMU at the outset may well be considerably less than the number that ultimately join, and that a smooth transition for later joiners is in the general interest.

Nonetheless, the fact that TARGET may be available--although, as noted above, only for transactions in the single currency--raises some interesting issues. Access to the single-currency large-value payments system may provide a significant incentive for banks and enterprises in countries not in EMU to undertake cross-border transactions in the single currency. If this incentive leads them also to maintain accounts in the single currency, this could imply considerable switching into the single currency even in those EU countries not in EMU. Additionally, if costs of financial operations are lower in EU countries outside the EMU area than in those inside the area, this may lead financial institutions to shift their business out of the EMU area. Especially as banks are likely over time to seek to centralize their treasury operations in one EU center, or maybe a few centers, they are likely to look closely at the relative benefits they would derive in the various centers available.

One related issue currently being discussed is that of remote access as defined in the section above. Since any bank licensed in any EU country automatically has the right to operate in any other EU country, there is a view that it would be difficult to resist remote access. On the other hand, there is also a view that conditions of access to particular NCBs, and hence the rules of operation of the various RTGSs, should be so harmonized that there is no particular incentive for remote access. It has been argued that

the ESCB needs to avoid a "provocation of shifts" in monetary operations. In part this results from a desire to maintain a decentralized basis for operating monetary policy, and in part it relates to a possible fear by those in some smaller financial centers that competition between centers could work to their detriment.

While harmonization of operating rules seems desirable in principle, there are difficulties in a number of areas. As regards opening hours, for instance, there is a concern in those countries operating shorter hours that maintaining those shorter hours may lead to a switch to operations to those EU centers where the operating hours are longer. 1/ On the other side, there is concern among those operating longer hours that any attempts to restrict those hours might lead to a shift of business out of the EMU. 2/

There are also likely to be difficulties in the design of a uniform pricing system. It is generally agreed that pricing should cover the development costs of the system, and also that pricing should be uniform across the EMU. However, development costs have been quite different across countries, depending upon whether the system was already in place beforehand or whether it had to be developed specifically in the context of EMU preparations.

It seems likely that a uniform price will be set for each transaction using the TARGET system, to avoid that banks source their transactions on the basis of minimization of payments costs. This would leave domestic transactions costing less than cross-border transactions. Also, it should be noted that the creation of the large-value payments system will of itself not reduce the cost of (noncash) retail transactions, which will probably largely continue to be settled through the correspondent banking process. 3/

There is also scope for disagreement over the range of participants in the payments system. In some EU members, all banks have direct access to the NCB; in others, there is a tiered approach, with only a smaller grouping (the "clearers" in the United Kingdom) having direct access to the central bank, and other banks operating through them. As noted above, there is also ambiguity, analogous to that in the design of monetary instruments and

1/ This clearly is not just an issue for payments system design. If hours of access to standing facilities, for instance, vary across countries, there is likely to be a drift of business to those centers where access is available later.

2/ It may be noted that even those central banks with the longest operating hours in the EU are open for a considerably shorter period than the system now operated by the US Federal Reserve System.

3/ The Maastricht Treaty gave the ESCB the possibility of developing a cross-border retail payments system, but did not make it mandatory. Since this area is at the moment seen as a relatively low priority, it is unlikely that there will be much significant development by the start of Stage 3.

coverage of any reserve requirements, as to what constitutes a bank. Work is currently under way examining the number of institutions that would be included if the broader definition of the financial sector were to be adopted.

However these difficulties are resolved, there is the prospect of the imminent introduction of a payments system throughout the EU which should represent the state of the art in terms of technology and payments risk analysis. This system is likely to bring considerable benefits to all the countries of the EU, regardless of the future course of EMU.

VIII. External Issues

Under the Maastricht Treaty, the foreign exchange regime is to be determined by the Council of Ministers after consultation with the ESCB, while the ESCB will be responsible for foreign exchange operations. Preparations in this area are the responsibility of the Subcommittee on Foreign Exchange Policy. It is widely held that the EMU will adopt a floating rate regime, at least at the outset. Aggregate interventions in the foreign exchange markets, it has been suggested, may be of roughly similar magnitude to those at present undertaken by the United States, Japan, or Germany.

1. Arrangements with other EU members

Only two countries (Denmark and the United Kingdom) have negotiated an "opt-out" arrangement under the Maastricht Treaty. Whether or not they exercise this "opt out", it is most likely that there will be other countries that will not join the EMU at the outset, since it is unlikely that all the other countries will meet the convergence criteria by that time. The question will arise as to which type of exchange rate arrangement should be established to link the non-EMU currencies to the EMU single currency from a monetary management perspective; an interesting issue is whether, in such new arrangements, short-term credit facilities should also be introduced. If so, experience of the past three years, when at times the Bundesbank found it difficult to offset in the domestic markets the monetary impact of its intervention obligations, means that the design of any such credit facilities will be important, to avoid the possibility that such facilities could jeopardize the achievement of the monetary objectives of the EMU.

In addition, it seems quite possible that, even in those countries that do not join EMU at the outset, there could be increasing use of the single currency, particularly in the smaller countries. For instance, as pointed out in the sections on the payments system, the corporate sector of EU countries not in EMU may find it easier to use the single currency in its transactions with EMU members, a choice that is made easier by TARGET. Such a development, if it takes place on a large scale, would reduce the monetary independence of the countries that are affected, and indeed could influence

also the monetary policy of the EMU countries. Under such circumstances, there will be arguments for assessing monetary conditions, and making monetary policy decisions, on a wider basis than just the monetary and economic conditions within EMU.

2. Foreign exchange operations

For the execution of foreign exchange operations, one can envisage three models, broadly analogously to those that may be adopted for domestic monetary operations: a highly centralized model with one single dealing room (maybe at ECB headquarters); a decentralized system in which NCBs receive instructions from the ECB and then undertake the actual interventions in their home markets, on the grounds that they have the expertise and are familiar with the counterparties; finally, a middle route whereby the operations are decentralized in "specialized NCBs", most likely those in the bigger financial centers.

According to the statute of the ESCB, the NCBs are allowed to retain and manage some of their foreign reserves; an upper limit has been stipulated in the Statute as to the amount of reserves that can be called up by the ECB. It is expected that the major influencing factor on the (national) reserves (and also the main reason for keeping them at the national level) will be the external debt servicing of their respective governments. NCBs will receive instructions from the ECB as to how they have to manage their reserves in such a way that their actions in the foreign exchange markets would not interfere with the Union's domestic monetary and foreign exchange policies.

IX. The Transition to a Unified Monetary Policy

1. Operating monetary policy at the start of Stage 3

A number of scenarios are at present being discussed regarding the transition to, and start of, Stage 3. 1/ In one scenario, the "delayed big bang", the conversion of the national currencies into the single currency would take place at a pre-specified date after the start of Stage 3. In this scenario, the ESCB would start conducting monetary policy on the basis of the irrevocably locked national currencies. Its

1/ An immediate and total conversion of all assets and liabilities into the common currency is excluded for at least three reasons. The first relates to political sensitivities; the second to technical and technological problems associated with the conversion of several national currencies into one new currency; the third stems from legal considerations. Some experts argue that it is still not clear whether financial assets and liabilities denominated in national currencies can be deemed to be payable in the new single currency. Hence the likelihood is that they will circulate in their national denomination until maturity.

transactions with financial institutions would still be conducted in national currencies, although its accounting could be done in the single currency. During this period, the NCBs would have to stand ready to convert any participating currency without limit into any other.

An alternative scenario (the "mounting wave") envisages that the ESCB conducts its monetary operations in the new single currency from the outset. Under this scenario, wholesale transactions rapidly also adopt the single currency, thereby ensuring that the bulk of financial transactions would be conducted in the single currency after a short while. 1/ In a variant of this scenario, the adoption of the single currency would be demand-led. The ECB would not start monetary policy in common currency according to a pre-set timetable, but would wait to do so until the market has sufficiently accepted the common currency.

As discussed above, uncertainties over the nature of the transition are making the design of the TARGET system more complicated than might otherwise have been the case. As regards monetary instruments, continued use of national currencies at the start of Stage 3 is likely to strengthen arguments for decentralization, and hence to increase the role of those instruments in which decentralization can most easily be achieved.

2. Lead times to start Stage 3

Much work is presently being undertaken to determine the minimum time needed between taking the decision to move to Stage 3 and actually making the move.

The Maastricht Treaty specifies that decisions regarding the operation of monetary policy in EMU are to be made by the ESCB, not the EMI. Thus, while preparatory work can be carried out with the present institutions, actual decisions will need to await the formation of the ESCB and the ECB. This event will be triggered by the decisions of the EU to move to EMU, and as to which countries will participate in EMU at the outset. A period of 12 months has been envisaged to take decisions regarding the framework for monetary policy, and for the national parliaments to prepare and vote the changes needed in the national legislation with respect to the country's monetary and foreign exchange systems. Regarding the development of the monetary instruments, a survey

1/ In its recently published Green Paper, the Commission of the EU (EU, 1995) expresses its preference broadly for this scenario. During the early part of Stage 3, a "critical mass" of activities in common currency would be built up to underscore the irreversibility of the process. A final phase would start when the replacement of all national notes and coins by the new common currency would take place, and the single currency then becomes the only legal tender on the EMU territory. According to the Green Paper, this phase could come as much as four years after the decision to move to Stage 3.

conducted by the EMI among the NCBs indicates that in some countries the lead time needed could be up to 18 months. The accounting framework needed to implement reserve requirements with averaging provisions seems particularly to need a long time; other changes--for instance, the introduction of standing facilities--can reportedly be accomplished much more quickly.

While some preparations can be started before the decision to begin Stage 3 is taken, the uncertainty regarding the participants and the specifics of the monetary policy framework--and the cost for central banks and financial institutions undertaking their conversions--are likely to act as deterrent to making major changes (unless justified anyway on domestic grounds) much in advance.

X. Conclusions

The Maastricht Treaty has led the EU central banks to put substantial efforts into examining the optimal design of instruments to operate a market-responsive monetary policy. These examinations have already generated valuable insights into the functions and modes of operation of the monetary instruments being used in the EU. Although, to some extent, central banks seem to have sought to defend their existing instruments of monetary policy, the interaction between the central banks, and the need to design monetary instruments for the rather different conditions that may exist in EMU, have led to a quite fundamental review of the instruments.

This review has taken place against a background where the conditions of operating monetary policy are radically different from those pertaining even a few years ago. First, domestic and external financial liberalization has increased the ease of movement of financial flows, both internally into and out of the banking system, and externally across frontiers. The application of monetary instruments must therefore be made taking this potential for large-scale disintermediation into account. Secondly, information system developments mean that signals can be transmitted instantly across entire regions and across financial sectors. There therefore becomes less reason for central banks to restrict their counterparties to particular areas or institutions. Third, there is deeper analysis of the implications of fostering central bank independence and of ensuring price stability as the primary policy objective: this is leading to further moves in some cases to distance a central bank from government, for instance by having the government place its deposits instead at commercial banks, and thus throwing into question some of the central banks' traditional fiscal agency functions. And fourth, there is increasing recognition of the interdependence between effective operation of monetary policy and adequate financial infrastructure more generally, particularly in the payments system. Thus in a number of EU central banks payment system development has acquired an increasingly important function, and has become recognized as a critical central bank specialism in its own right.

The work being undertaken in preparing for the operation of monetary policy in Stage 3 thus reflects both the changing conditions in monetary and financial markets generally as well as the factors specifically associated with EMU. It is in part this dual aspect of the work that promises to provide important lessons in monetary management also for countries outside the EU.

Although there is no view yet as to whether a monetary aggregate should be used as an intermediate target of policy, it seems to be agreed that interest rates should be the principal operating instrument. Monetary management therefore involves operating on interest rates; in this context, central bank interest rates are seen as serving three broad purposes: steering, bounding, and signalling.

Monetary instruments under examination are divided into three categories: reserve requirements, standing facilities, and open market operations. There is broad agreement that open market operations will be a central instrument, but no uniformity of view yet on the extent to which they should be complemented by reserve requirements. Use of reserve requirements plus standing facilities to set upper and lower bounds to interest rates, and create a "corridor" within which interest rates could move freely, would enable the monetary authorities to undertake open market operations relatively less frequently. On the other hand, even without reserve requirements and regular standing facilities, interest rate objectives could be fully achieved through open market operations alone. Moreover, while there seems to be agreement on the establishment of an upper bound to interest rate movements, through provision of a Lombard facility, views still differ on how--and indeed whether--there should be standing facilities for a lower bound.

The choice of regime may be seen to depend on three broad factors: first, the degree of concern one has at the various possible distortionary effects of reserve requirements and some standing facilities--the more these are of concern, the more likely that one would wish to rely on OMOs alone; second, the nature of the signals that one wants the monetary authorities to be giving to the market--if one wants the authorities to be giving continuous signals, one would rely on OMO; but if one wishes to limit market signals to discrete administered changes, one would tend to establish a corridor and intervene only by moving the bounds of the corridor; and finally, the degree of decentralization one wishes to achieve--if OMOs are undertaken frequently, this is likely to have to be on a relatively centralized basis, so if decentralization has a high priority this may point toward a system which is self-stabilizing, and where OMOs need only be undertaken infrequently.

In the context of this last factor, it is worth stressing that monetary policy formulation in a single monetary area is essentially indivisible. Thus decentralization relates to the implementation of policy once the policy has been determined in the center.

The development of a pan-EU payments system is seen as an integral part of the preparation for Stage 3. Considerable work has been undertaken to develop Real Time Gross Settlements (RTGS) systems in each of the member countries. It is expected that such systems will be in place in all but two member states by end-1996. Work is now proceeding to integrate these national systems (the TARGET project) to create a pan-EU transfer system in the prospective single currency. Good progress is being made, although a number of issues remain to be addressed. One is the question of remote access: the degree to which banks should be able to access directly the RTGS in another member state. Another is the degree of harmonization that should be achieved in the operating procedures of the national systems, and indeed in the target system itself--for instance, as regards opening hours of the RTGSs in the various countries. This raises issues as to whether central banks should in effect be competing with each other for shares in settlements systems business, and has yet to be fully addressed.

As suggested above, it should be recalled that the discussions regarding the choice of instruments are being conducted in the context of wider on-going developments, including the overall economic integration associated with the EU's internal market program. It is noteworthy that there has already been considerable innovation in EU members' monetary policy instruments in recent years, due as much to these wider developments as to the prospects for EMU: the widespread reduction, or abolition, of reserve requirements is one example.

Prospects appear good that the EMI and the various sub-committees and working parties will meet their end-1996 deadline to complete the specification of the regulatory, organizational, and logistical framework necessary for Stage 3 of EMU. However, much work remains to be done. Indeed, even where there appears to be consensus, such as on the desires to "decentralize" to the extent possible and to rely on open market operations as the principal instrument of monetary management, it is not clear how much agreement there actually is at this point in making the concepts operational.

Overall, there seem to be two broad models. One focuses largely on wider financial market developments, and seeks to establish monetary instruments which reflect these, for instance ensuring the use of state-of-the-art information systems technology, and seeking to minimize risks of disintermediation from the banking system of the Union area. The other focuses on the objective of enabling self-stabilization by the markets so that the monetary authorities need not themselves make frequent interventions in the money market, and stresses the need to design instruments to achieve this objective. Advocates of the latter approach acknowledge that it shares in large measure the focus of the Bundesbank, and argue that rapid establishment of the credibility of the prospective monetary institution will be assisted by ensuring that its operating procedures resemble those that have been applied in the most successful of the participant NCBs. Much is therefore made of the view that the ESCB will be able to "inherit" credibility. With regard to the links with the practices of the Bundesbank, however, it is worth noting that the Bundesbank

too has modified its procedures quite substantially in recent years--for instance, there have been reductions in reserve requirements, and the frequency of repo operations in the markets has increased. Additional changes are envisaged for the future--for instance, the number of Bundesbank branches is expected to decline. Such changes reduce the differences between the models being examined.

Finally, it is clear that the EMU discussions are likely to have important implications for the conduct of monetary policy more widely. For instance, the provisions on central bank independence are already influencing central bank laws, for instance in central and Eastern Europe. The development of the RTGSs is likely to spur the development of such systems worldwide. The withdrawal of some EU central banks from their traditional function of acting as banker to the Government may also come under wider consideration. Once decisions are reached on the choice of monetary instruments, these too are likely to have a wider influence. In some areas--especially on the payments systems--work in the EMU context has been conducted alongside work for a wider grouping of countries, such as the G10, which should serve to ensure that EMU developments are consistent with those taking place more widely. In those areas where no such formal parallel process exists, it will be important to maintain other channels to ensure that the wider community is aware of EMU developments and is able to provide feedback during this critical period.

Features of Reserve Requirements in EU Member States*
(Situation as of end-1994)

	DE	GR	ES	FR	IE	IT
1. Reserve ratios	- Sight liabilities: 5% - Remaining eligible liabilities: 2%	- Domestic currency liabilities: 9% - Foreign currency deposits held by residents and immigrants: up to 100%	2%	- Sight deposits and passbook accounts: 1% - Remaining eligible liabilities: 0.5%	3%	15%
2. Length of computation period	1 month	1 month	10 days	1 day	1-day	1 month
3. Length of maintenance period	1 month	1 month	10 days	1 month	1 month	1 month
4. Lag ^(a)	15 days	60 days	2 days	15 days	50 days	45 days
5. Averaging provisions	yes	no	yes	yes	no	yes ^(m)
6. Vault cash satisfies RRs	yes ^(c)	yes	no	yes	yes ^(d)	no
7. Carry-over provisions	no	yes ^(a)	no	yes ⁽ⁿ⁾	no	no
8. Remuneration	no	yes ^(p)	no	no	yes ^(q)	yes ^(r)
	NL ^(u)	AT	PT	FI	UK ^(v)	BE/DK/LU/SE
1. Reserve ratios	Changed frequently according to money market conditions	- Sight liabilities: 9% - Time/saving deposits: < 1 year: 7% ≥ 1 year: 6% - Securities: < 2 yrs: 6%	2%	- Sight & time deposits: < 1 month: 2% - Other deposits: 1.5% - Other liabilities: 1%	0.35% ^(w)	No reserve requirement system currently in use
2. Length of computation period	3 months ^(m)	1 month ^(m)	7 days	1 day	6 months ^(m)	-
3. Length of maintenance period	variable	1 month	7 days	1 month	6 months	-
4. Lag ^(a)	variable	15 days	3 days	60 days	about 6 months	-
5. Averaging provisions	no	yes	yes	no	no	-
6. Vault cash satisfies RRs	no	yes	no	no	no	-
7. Carry-over provisions	no	no	no	no	no	-
8. Remuneration	yes ^(b)	no	no	no	no	-

Source: EMI, Annual Report 1995, based on national data.

- (a) Interval from end of computation period to end of maintenance period.
 (b) Daily balances cannot be less than a given percentage (currently 91%) of the monthly average requirement.
 (c) Credit institutions are allowed to deduct their average holdings of notes and coin over the maintenance period up to a limit of 25% of the required reserves.
 (d) Each credit institution is required to place a one-month deposit with the central bank on the 20th of each month. The deposit is equal to 3% of the institution's eligible liabilities on the last day of the preceding month less 1st holdings of notes and coin on that day. With effect from March 1995 onwards, a limit of 20% will be placed on the extent to which holdings of notes and coins may count towards a credit institution's reserve requirement.
 (e) Only reserve deficiencies can be carried over.
 (f) Up to 90% of reserve excesses can be carried over when the excess is below 2% of the requirement. Up to 75% of the amount of an excess above the latter percentage can be carried over. Reserve deficiencies cannot be carried over.
 (g) Half of the required reserves are remunerated at a rate of 12.5%.

- (h) Required reserves are remunerated at a rate equal to 80% of the yield on selected short-term domestic government bonds with a remaining maturity of over six months and under three years and six months. The interest rate is adjusted at the beginning of each maintenance period. The interest rate on required reserves is normally below the one-month interbank rate. However, in the event of a steeply sloped positive yield curve, the rate can exceed the one-month rate.
 (i) Required reserves are remunerated at 5.5%. Excess reserves are remunerated at 0.5%.
 (j) The information in this column is on the money market cash reserve.
 (k) The information in this column is on the cash ratio deposits.
 (l) 0.25% for eligible liabilities of the Northern Ireland offices of banks for which Northern Ireland is the principal place of business in the UK.
 (m) The amount of eligible liabilities is identical to the amount used by the central bank to determine the so-called "permissible borrowing" from the central bank. Permissible borrowing is set for each individual bank as an average borrowing over a period of three months and is calculated on the basis of an average of banks' liabilities over the previous three end calendar months.
 (n) Required reserves are calculated on the basis of the average of the eligible liabilities on the 23rd and on the last day of the previous month and on the 7th and 15th of the reporting month.
 (o) The level of an institution's required deposits is calculated twice a year (in April and October) as 0.35% of the average eligible liabilities reported at the previous six end calendar months.
 (p) Weighted average of secured loans rate and special advances rate.

Monetary Policy Strategies, Instruments and Procedures in EU Member States*

	BE	DK	DE	GR	ES	FR	IE	IT	NL	AT	PT	FI	SE	UK
Monetary Policy Strategy ^(a)	XR	XR	MT (M3)	XR, MT (M3)	IT, XR	XR, MT (M3)	XR	MT (M2)	XR	XR	XR	IT	IT	IT
Reserve Requirements for Monetary Policy Purposes	no	no	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no	no
- Size (% of GDP) ^(b)	...	...	1.3	4.3	1.4	0.1	1.3	6.7	3.7	2.8	1.8	1.3	...	...
- Remuneration	...	...	no	partly	no	no	close to market rates	partly	close to market rates	no	no	no	...	...
Standing Facilities ^(c)														
- Lending facilities at below or close to market rates (rate)	<input type="checkbox"/>	...	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	(below market)		(below market)	(below market)				(close to market)	(close to market)	(close to market)				
- Deposit facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	...
- Marginal refinancing	<input type="checkbox"/>	...	<input type="checkbox"/>	<input checked="" type="checkbox"/>	...	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Open Market Operations														
1. Types: ^(d)														
- Outright transactions ^(e)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	...	<input checked="" type="checkbox"/>	...	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
- Reversed transactions in domestic securities	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
- Foreign currency swap transactions	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	...	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	...	<input checked="" type="checkbox"/>
2. Frequency of operations: ^(e)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
3. Auction procedures: ^(d)														
- volume tender	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	...	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
- interest rate tender	<input checked="" type="checkbox"/>	...	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	...	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Source: EMI, Annual Report 1995, based on national data.

- (a) Position at end-1994. XR = Exchange rate target; IT = Inflation target; MT = Monetary target. For countries pursuing monetary targets the targeted aggregate is shown in brackets.
 (b) Required reserves held at the central banks to nominal GDP (mid-1994 figures, except Portugal for which end-1994 figures are shown).
 (c) Importance in providing (or withdrawing) liquidity to (or from) the market: Low; Intermediate; High.
 (d) These include issues of certificates of deposit by the central bank in the cases of Denmark, the Netherlands and Finland, fixed-term deposits in the case of Ireland and Sweden, and placing or accepting deposits in the interbank market in the case of Belgium, Greece, the Netherlands and Finland.
 (e) About once a week; Several times a week; More than once a day.

Decentralization of Monetary Operations in Germany

With emphasis being placed on the provision in the Maastricht Treaty that there should be decentralization "to the extent possible", it is worth examining briefly present practices in the Bundesbank, frequently taken as an example as to what decentralization might involve.

The Bundesbank Directorate is located in Frankfurt and is the executive arm of the central bank. Major decisions--such as changes to the interest rates on the standing facilities--are taken by the Council of the Bundesbank, which includes the members of the Directorate, but on which the Presidents of the 10 Landeszentralbanken (LZBs) have the majority. The Bundesbank presently has a four-tiered structure: beneath the Federal Headquarters and the Headquarters of the LZBs, there are about 120 branches of the Bundesbank (the number is gradually declining), and sub-branches beneath these.

Germany's 4000 banks--many specialized by sector or by region--have their principal relationships with the branches (or sub-branches) of the Bundesbank. Multiple relationships are common, although there has been some recent consolidation. One big commercial bank formerly had one hundred accounts with the Bundesbank; now it has only twenty. Reserve requirements are held at the branches.

Refinancing too is through the branches. Although the decision as to how much the individual banks can actually refinance is up to the LZBs, decisions on total volumes (i.e., "calculated quotas") are up to the Bundesbank Council. Changes to this total are infrequent, between the annual November recalculations to update on the basis of the capital in banks' balance sheets. The size of the calculated quotas is passed on to the LZBs, which may make modifications for particular reasons, e.g., excessive credit risk may lead to a reduction in refinancing actually extended. Also, there are modifications for banks that are partly state-owned.

The main open market instrument is the repo: bids are taken, and allocations made, through the branches. Branches give information to the banks regarding the tender, and bids are made by the banks to the branches. The branches aggregate them and pass them to the LZBs which in turn aggregate them and pass them on to Headquarters. Headquarters therefore just receives aggregated bids from the LZBs. There is no problem of non-local banks being involved in bids, since bids will require collateral.

Due to the structure of the banking system, some small banks do not participate directly in the tender; rather they participate through their sectoral Headquarters. Most banks make their bids through the branches where they have their Headquarters, e.g., the Westdeuschelandesbank makes its bids in Duesseldorf. Banks can choose to bid wherever they have branches. It makes sense for them to make their bids through a centralized treasury.

All decisions on the tender are by the Directorate and the Council; there is a two-week cycle: the Council determines the interest rates on volume tenders, and the volume on interest rate tenders, and announces these on a Tuesday morning. The LZBs communicate the details to the banks in their region and solicit responses by 3:00 p.m. on Tuesday. Multiple bids are permitted. The decision as to how much is actually supplied to the market is made on the Wednesday morning by the Directorate. A staff working group estimates the liquidity gap in the banking system, and it evaluates how quickly the gap should be filled--this is largely a matter of tactics. The decision of the Directorate on Wednesday morning is based on a proposal by the research department; the department meets daily to update the liquidity position and sends a paper to the Directorate.

A "Schnelltender"--used to fine-tune liquidity in the event of unexpected changes in liquidity conditions--works in the same way, except that only a small number of bids is solicited. Schnelltender decisions are made by the Directorate, not the Council. The responsible official speaks to the research department, who make a recommendation to the responsible director, who contacts the rest of the Directorate (which requires three directors to be quorate, and which must justify its actions at the next Council meeting). This process takes maybe a quarter of an hour. The official then contacts the LZBs, either by telephone or by fax. Banks are then contacted and given a quarter of an hour to react. The entire process takes about one hour.

There was only one Schnelltender in the last year. There were, in addition, 4-5 fine-tuning interventions in the last year through sales of treasury bills; this process is covered by Section 42 of the Bundesbank Act. The treasury bills are such in name only, and the entire cost is borne by the Bundesbank.

In 1993, there was monthly fine-tuning in response to the ERM interventions. The Bundesbank used "Section 17" instruments--it shifted Federal Government funds held in the Bundesbank to the money market to provide liquidity to keep interest rates under control. This procedure has been abolished because of the provision in Stage 2 of Maastricht prohibiting central bank credit to government. As a counterpoint, under the earlier arrangements the Federal Government had had to hold its balances at the Bundesbank; this provision too has been dropped. Correspondingly, the Bundesbank has expanded the volume of treasury bills at its disposal from around DM 18 billion to DM 50 billion--a process similar to that adopted by the Danish and Spanish central banks. In fine-tuning operations the usual maturity is 2-3 days, since they are seen simply as a bridge to the next tender.

In 1993, the Bundesbank issued its own paper, the "bullis." The last tranche has recently run out. The purpose was to compensate for the reduction in reserve requirements. It had been expected that the domestic private sector would buy them to reduce M3. Instead, they were largely bought by external investors, including central banks.

One major form of centralization is the information system. Headquarters ensures that there is fully compatible software and hardware throughout the Bundesbank system.

The Bundesbank uses screens only for informational purposes, for instance to inform the public of the results of the repos, and also other fine-tuning activities. Telephone contacts are the principal form of communication for conducting the monetary operations. For a Schnelltender, where timeliness is important, only a relatively small number of counterparties is involved, telephone contact is feasible.

Very little use is made of foreign exchange swaps, in part because of the two-day lag for delivery. Same-day delivery would lead to a need to block collateral from the Lombard facility.

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