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FINANCIAL STABILITY IN EUROPEAN ECONOMIC AND MONETARY UNION

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In my opinion, banking supervision is a central bank function. The combination, within the central bank, of banking supervision with lender of last resort, oversight and monetary policy functions offers distinct advantages. These advantages should not be ignored, considering the significance of financial stability—especially within an open and liberalized economy—and the contribution which banking supervision makes in this respect.

—W. F. Duisenberg, *President of the Netherlands Bank and of the Bank for International Settlements, June 19, 1995*

1 INTRODUCTION

From the start of European Economic and Monetary Union (EMU) in January 1999, financial policies in the European Union (EU) have been guided by the new institutional framework for EMU financial policy-making mandated by the Treaty on European Union (Maastricht Treaty) and other EU agreements. This framework consists of the new EU-wide payments system, the Trans-European Automated Real-Time Gross Settlement Express Transfer (TARGET) system; the new European System of Central Banks (ESCB); and the evolving arrangements for financial supervision and regulation, systemic-risk management, and crisis management of pan-European institutions and markets. The potential impact this framework might have on the ability of European policymakers to ensure financial stability and manage financial crises within EMU is the subject of this study. It focuses, in particular, on the allocation of lender-of-last-resort (LOLR) and banking-supervision responsibilities among the European Central Bank (ECB) and the national central banks (NCBs), national supervisors, and national treasuries of the eleven member countries.

Chapter 2 of this study examines three financial-stability challenges remaining within EMU that might have a direct bearing on systemic risk. First, the intense competition between EMU payments systems creates the possibility that part of the large-value transfers that are widely expected to be settled within TARGET might be settled in lower-cost, private, alternative payments systems. This could mean that reductions in systemic risk might be smaller than is generally expected.

An earlier version of this study was presented at the conference on Monetary Policy of the ESCB: Strategic and Implementation Issues, cosponsored by the Banca d'Italia and Università Bocconi (IGIER and Centro "Paolo Baffi") in Milan on July 6 and 7, 1998. The study accounts for developments and publicly available information up to the end of 1998, with a postscript added in June 1999. The inquiry benefited from informal discussions on technical aspects of EMU with private market participants and staff at the Banque de France, the Bank of England, the Deutsche Bundesbank, the European Monetary Institute, and the U.K. Financial Services Authority. The authors acknowledge conference participants and Michael Mussa, Lorenzo Bini Smaghi, Pietro Catte, Burkhard Drees, Curzio Giannini, Mauro Grande, Laura Kodres, Charles Kramer, Ferdinando Sasso, and Eduardo Levy Yeyati for helpful discussions. The views expressed in this study are solely those of the authors and should not be attributed to the International Monetary Fund or its staff.

Second, there are financial and systemic considerations associated with the emergence of pan-European money and financial markets. Third, increased competitive pressures within EMU may lead to continued, if not accelerated, consolidation and restructuring of the European banking system in an environment of bank disintermediation, widespread public ownership, and rigid labor laws.

Chapter 3 examines EMU's current implicit (and ambiguous) mechanisms for resolving banking problems and, in particular, banking crises.

Chapter 4 discusses the theory and practice of crisis management, focusing on Bagehot's principles of LOLR responsibilities, two alternative concepts of the potential role of central banks in implementing LOLR responsibilities, and actual practices in selected advanced countries. Because the Deutsche Bundesbank is the model on which the ESCB has been designed, the final section of Chapter 4 examines the crisis-management framework prevailing in Germany. It concludes that, in practice, the Bundesbank has played a somewhat more active role in banking supervision, crisis management, and LOLR responsibilities than is generally understood.

Chapter 5 examines the options for crisis management within EMU and, in particular, the options for assigning LOLR responsibilities for pan-European financial crises.[1] It discusses (1) the infeasibility of leaving LOLR responsibilities entirely to lenders-of-penultimate-resort deposit-insurance schemes, liquidity consortia, pools of solvent banks, and treasuries, (2) the potential problems associated with NCBs acting independently as lenders of last resort, (3) the potentially limited access of the ECB to supervisory information, and (4) potential problems in allocating and sharing responsibilities for crisis management. The discussion suggests that the EMU framework deviates in some ways from practices in other industrial countries, including countries like Germany, in which the central bank does not have formal supervisory responsibilities. It notes, moreover, that it is an open question how

[1] This study does not consider national or local financial problems that are of no immediate threat to national or European financial markets. Examples of such problems would include the recapitalization of small local retail-banking institutions in the towns and villages of individual countries. In general, these local problems manifest slowly and involve decisions by local or national fiscal authorities, rather than by EMU-wide financial or monetary authorities. In cases where a national problem entails considerable ambiguity about the EMU cross-border monetary and financial implications, the involvement of the ESCB and a number of national supervisory authorities and national treasuries might warrant the involvement of a pan-European LOLR if and when one is put in place.

Europe will, in practice, allocate and share responsibilities among the ECB, the NCBs, and numerous national authorities for resolving pan-European banking and financial problems. This chapter reviews statutory allocations of responsibilities within EMU and considers whether uncertainties about the possible interpretations of statutory mandates constitute what is normally meant by the principle of "constructive ambiguity." It considers options for assigning LOLR responsibilities that might reduce the potential for coordination problems during a fast-breaking pan-European crisis, hasten the detection and resolution of problems, and help ensure EMU credibility.

Chapter 6 summarizes the study. Six appendices provide background material. A postscript brings the discussion up to June 1999.

2 REMAINING CHALLENGES TO FINANCIAL STABILITY WITHIN EMU

Ensuring financial stability within EMU may be particularly challenging in these early years. First, there is the possibility that TARGET might yield only some of the expected reductions in potential systemic risks, in part because a share of large-value transactions may seek lower-cost alternative systems. Second, as new pan-European markets emerge, the growth of cross-border unsecured interbank lending might lead to much greater market integration and, thus, greater potential for financial spillovers and contagion—at least until the creation of an EMU-wide repo market—and the widespread use of secured (collateralized) interbank credit lines. Third, the euro is expected to accelerate the restructuring of European banking systems in an environment in which it may be difficult to close banks and to reduce costs through downsizing. In such circumstances, inefficient and unprofitable institutions may continue to operate and engage in increasingly risky activities.[1]

These tendencies to raise the potential for systemic issues may not be felt immediately, because market integration and bank restructuring may not occur quickly. This delay will put off the creation of pan-European markets and a pan-European banking system—and the considerable benefits such developments will have for investors and consumers—but it will also provide time for adjustments. Current limited cross-border mergers among European banks, gradually increasing competitive pressures in the retail sector, widespread public ownership, and still-underdeveloped capital markets may provide some EMU countries with more time for restructuring banking systems and with the ability to continue to rely on decentralized arrangements for market surveillance and crisis management based on home-country supervision. Through time, the introduction of the euro is expected to encourage the creation of a set of pan-European markets and institutions, which may require the centralization of financial surveillance, systemic-risk management,

[1] Systemic risk is the risk associated with "the propagation of an agent's economic distress to other agents linked to that agent through financial transactions" (Rochet and Tirole, 1996, p. 733). Systemic risk is present in various parts of the economy, but it has been studied primarily in relation to the banking sector, in part because of uncollateralized interbank transactions, including intraday debits on payments systems, overnight and term interbank lending, and contingent claims.

and crisis resolution. Institutional arrangements in several Group of Seven (G–7) countries—Canada, Japan, the United Kingdom, and the United States—indicate that central banks may be a natural place to centralize some of these functions. Before discussing these issues, we examine systemic matters associated with the implementation of TARGET, the creation of pan-European financial markets, the likely acceleration of banking-system consolidation and restructuring, and the associated emergence of pan-European financial institutions.

The Implementation of TARGET

The TARGET payments system (see Appendix A) is a central feature of the financial infrastructure for EMU. Its two main objectives are (1) the creation of an efficient system of cross-border payments that will integrate money markets and support the implementation of a single monetary policy and (2) the safeguarding of the prospective pan-European financial markets and financial institutions from systemic events. The system is composed of as many real-time gross-settlement (RTGS) national payments systems as there are EMU members, with each national system administered by the respective NCB and linked to all the other EMU payments systems through a communications network. Cross-border payments are settled through the accounts of NCBs. Until a few years ago, most European payments systems were not RTGS systems but were, instead, end-of-day settlement systems, netting systems, or a combination of both, some with several settlement periods. In non-RTGS systems, financial institutions accumulate very large open positions against counterparties and run the risk of losses caused by settlement failures. The advantage of RTGS systems is that each payment is made final as it occurs, so that large outstanding positions are not accumulated. The reduction in systemic risk resulting from a well-functioning RTGS system will in turn diminish the need for LOLR intervention for payments-system reasons. This was one of the key reasons why the decision was made to incur the considerable costs to establish TARGET as a network of RTGS systems.

The TARGET system is likely to face competition from other RTGS systems, private netting schemes, and correspondent banking. Although TARGET is broadly considered to be well conceived, there is a risk that the official perception that all high-value payments—the kind of payments with systemic-risk components—will be sent through TARGET might turn out to be erroneous. Because large-value transactions use intraday credit, the collateral requirement for obtaining intraday credit within TARGET means that institutions must obtain and tie up

earnings assets. This is costly, and institutions will try to economize by using alternative settlement mechanisms—including correspondent banks and netting systems such as the net clearing systems of the European Bankers' Association (EBA) and the Euro Access Frankfurt (EAF),[2] which settle at regular intervals—and will use TARGET only for time-critical payments that need the immediacy of final payment. In particular, if EAF can settle net open positions several times a day without a high risk of queuing or gridlock, there may be an incentive to use TARGET mainly for urgent, time-critical payments and payments that are not likely to be offset quickly by opposite payments, and that therefore require intraday credit.[3]

Whether or not high-value transactions are sent through TARGET depends on the availability and cost of collateral. The need for intraday credit and the resulting demand for collateral are likely to be smaller

[2] Global institutions in EMU could offer correspondent banking services for high-value payments through their branches, which would increase their exposure to settlement risk.

The EBA system currently comprises 103 member banks, including 49 clearing banks worldwide. In EBA, settlement is at the end of the day. To strengthen the system, there is a permanent collateral pool (currently 15 million euro per participant) covering one or more failures up to an agreed maximum amount of the single largest net debit position in the system (Lamfalussy Principle IV; see Working Group on EC Payment Systems, 1993, pp. 23–24). In addition, net debit and net credit caps constrain payment flows. To reduce legal risk, an innovative "Single Obligation Structure" has been introduced "whereby payment obligations are agreed, from the outset, to be on a net basis."

The EAF system is the net clearing system owned by the Landeszentralbank in Hessen, Germany, which allows remote membership. It is a hybrid system with a frequency of settlement higher than in traditional netting schemes but not as high as in RTGS systems. Sophisticated settlement algorithms allow EAF to alternate continuously bilateral and multilateral settlement clearings during the day (in twenty-minute cycles). Most payments tend to be settled during the bilateral phase with funds deriving from opposite payments within the system. The need for liquidity should be minimized, because liquidity is required only in the multilateral phase for that portion of payments that exceeds the bilaterally offsetting payment flows (which usually do not match exactly). Given that the unwinding of cleared and settled payments (bilaterally or multilaterally) is not possible, there is no risk of domino effects and, just as in RTGS systems, there is an ongoing flow of final payments available to the receiving banks. Finally, EAF satisfies Lamfalussy standards because, during the multilateral settlement phase, the algorithm defers payments not covered by enough liquidity on the account of the sending bank until all debit positions are covered.

[3] Given that the high frequency of settlements in EAF may reduce the speed advantage of TARGET, to make a bank decide to use TARGET, the need for intraday credit, and not only the urgency of the payment, is important. Whereas in normal circumstances, the average processing time required to complete a TARGET transaction is about one minute (Godeffroy, 1998, and ECB, 1998a), the maximum estimated time may be somewhat longer (see EMI, 1997e, p. 3–3).

than would be estimated on the basis of pre-EMU open positions in net payment systems, because RTGS systems—and the cost of collateral—provide strong incentives for more effective cash, liquidity, and payment-flow management. In addition, the definition of eligible collateral is quite broad (see Appendix B). The stock of available collateral, however, is likely to be smaller than the outstanding stock of eligible assets, because retail and institutional investors, who hold a large share of eligible assets, are not always in the markets to make their assets available on short notice, and because current technical limitations of some EMU securities settlement systems (see below) imply that securities may need to be predeposited before being used as collateral to obtain intraday credit (ECB, 1998c) In addition, it remains to be seen whether commercial banks will be ready to reduce their stocks of liquid assets below the threshold required to meet prudential liquidity requirements at the end of the day in order to obtain intraday credit (even though this may be technically possible).[4] Finally, as in futures markets, the demand for eligible assets might tend to concentrate on a few (scarce) assets that are the "cheapest to deliver" and that will end up in excess demand.

The cost of depositing collateral also has several components. First, the cost reflects the trading opportunities lost on the underlying assets, varies over time, and probably increases when liquidity is most needed. Among the several alternative uses of eligible assets are their utility in cash trading (for delivery in futures markets) and their use as collateral in monetary-policy operations. The more developed financial markets are, the greater are the trading opportunities for securities and the opportunity cost of collateral. Second, to acquire and manage portfolios of eligible assets, credit institutions pay commissions and incur the costs of market spreads. Third, if credit institutions need to hold a larger stock of eligible assets than they would hold for prudential reasons, they will incur additional funding costs.

Market participants have suggested that these costs, taken together, may be high and more relevant than the (also higher) transaction cost of a TARGET payment. In France, short-term interbank loans that are

[4] In practice, bank supervisors seem to allow assets held for prudential liquidity requirements to be used as collateral for intraday credit, although only the Bank of England (BOE) appears to have explicitly clarified the issue by introducing the concept of "sequential duty." Under this convention, eligible liquid assets can be used both to support payment flows in the Clearing House Automated Payment System (CHAPS, the large-value payment system used during the pound sterling crisis of September 1992) during the course of the day and to satisfy the prudential liquidity requirement on an overnight basis.

settled in the RTGS system have an interest premium, which is not incurred with loans settled in the netting system (Godeffroy, 1998). In part for this reason, some high-value payments—which are the most likely to require intraday credit—might not use TARGET but might use netting schemes like EBA and EAF instead.[5] This may produce a hierarchy of euro payments different from that which was envisioned when the system was designed. The imagined hierarchy was a pyramid in which most low-volume, high-value payments (which carry systemic-risk components) would settle in TARGET, at the top of the pyramid, and in which high-volume, low-value payments would settle in alternative (some private) settlement systems, at the bottom of the pyramid (see, for example, Larkman, 1998). The TARGET system was based on this concept in order to reduce and limit the risk of systemic events within EMU.

In assessing the prospects for using alternatives to TARGET as a settlement mechanism, several counterarguments should be taken into account. First, participants in netting schemes incur collateral costs resulting from collateral that is deposited to satisfy Lamfalussy Standard IV. This collateral is permanently deposited, whereas collateral for TARGET intraday credit is deposited only for the duration of the intraday credit operation. Private netting schemes, moreover, charge annual admission and participation fees, which are not incurred with TARGET. Second, the opportunity cost of collateral may be lower than is generally perceived. Both systems envisaged in EMU for depositing collateral ("pooling" and "earmarking") may allow institutions to substitute the underlying assets on a daily basis, in which case institutions can trade them as long as these institutions have a sufficient pool of other eligible assets to replace them in deposits as collateral.[6] The efficiency and flexibility of these arrangements can play a critical role in determining how intensively TARGET will be used.[7] The technical

[5] The cost of setting aside collateral may provide incentives for developing intraday interbank loans. This would reintroduce a degree of credit risk into the system.

[6] In a pooling system, counterparties may, by definition, substitute underlying assets on a daily basis, because individual assets in the pool are not linked to specific credit operations with the ESCB. In an earmarking system, specific identifiable assets are linked to each credit operation, but NCBs adopting this system may still permit their substitution (see EMI, 1997c, p. 43).

[7] Indeed, in a sample calculation, the Banca Commerciale Italiana (COMIT, 1998) showed that the collateral cost per payment in TARGET will be higher than in EBA if the collateral in TARGET is "immobilized," whereas it will be lower if it is "mobilized." See also the estimates of collateral costs in Folkerts-Landau, Garber, and Schoenmaker (1996).

limitations of some EMU securities settlement systems, however, as listed in a recent ECB (1998c) publication, imply that securities may need to be predeposited before they can be used as collateral. This will most likely translate into lost trading opportunities, even with flexible pooling and earmarking systems in place.

The ECB (1998d, pp. 10–11) indicated that it expected the opportunity cost of collateral needed for intraday credit to be minimal for several reasons. First, fully remunerated reserve requirements will be available for payments during the day. Second, credit institutions will hold assets for other reasons as well. Finally, efficient procedures to allow easy collateral substitution and cross-border use of collateral have been developed.

Although these factors are likely to reduce costs, they probably are insufficient to rule out entirely the possibility that large-value transactions might be sent by way of competing schemes. Specifically, although the ability to use fully remunerated required reserves intraday provides banks with a cheap source of funds for meeting the considerable intraday liquidity needs of TARGET, it does not imply that the need for intraday credit will be negligible. In the United States, required-reserve balances can also be used for payments-systems purposes; the only difference is that U.S. required reserves are not remunerated. Nevertheless, the liquidity needs of banks considerably exceed required reserve balances. In 1995, for example, to use Fedwire (the U.S. RTGS system), depository institutions incurred an average of $45 billion a minute of daylight overdrafts (that is, negative balances during the day on their reserve accounts at the Federal Reserve), with daily peaks as high as $75 billion.[8] In TARGET, similar overdrafts could be incurred only by obtaining fully collateralized intraday credit from the ESCB.

Another important aspect of the U.S. experience is that even when an RTGS system is subsidized (as is Fedwire, in which overdrafts may be used—up to an institution-specific cap—by paying a fee and without depositing collateral), a large share of payments goes through alternative netting schemes. The daily average value of transactions in the Clearing House Interbank Payments System (CHIPS), in New York, is actually larger than in Fedwire, although the daily average number of transactions is smaller (see BIS, 1997, annexes 1 and 2). The larger daily transaction size in CHIPS suggests that, at least in the United States, netting schemes attract a significant share of systemically important large-value transactions.

[8] Here and throughout, billion equals one thousand million.

Whether or not banks will use TARGET for high-volume small-value transactions, which require little use of intraday credit or collateral depends largely on the cost per transaction. The Governing Council of the ECB specified the TARGET price structure on June 10, 1998, with the fee to be charged according to the following scale: 1.75 euros for each of the first 100 transactions per month, 1 euro for each of the next 900 transactions per month, and 0.80 euro for each subsequent transaction in excess of 1,000 per month. This cost is considerably lower than earlier European Monetary Institute (EMI) estimates but remains high relative to competing netting schemes and other RTGS schemes; EBA and EAF have announced they will charge a price close to 0.25 euro per payment, and the German Express Electronic Credit Transfer System (Eiliger Zahlungsverkehr) is now expected to charge 0.25 euro per transaction (BOE, 1998, p. 19).

London-based and other noneuro European Economic Area (EEA) institutions will have additional disincentives to use TARGET. First, some limits have been set to their ability to access TARGET and obtain intraday credit from their national central bank (see Appendix A). Second, although London-based institutions might obtain intraday credit in TARGET through a subsidiary or branch based in EMU, many of these institutions will have relatively small inventories of euro assets—if it is not part of their primary business in London—and will therefore need to acquire and maintain a pool of eligible euro assets if they want to receive intraday credit. In their list of Tier II assets, however, NCBs may include—after ECB approval—assets denominated in EEA or other widely traded currencies, including the British pound, and issued in EEA countries with the risk to be borne by the non-EMU national central bank of the non-EMU institution requesting intraday credit (see Appendices A and B). Third, using a subsidiary or a branch in an EMU country to obtain unrestricted access to intraday credit will entail extra costs, because it will require rebooking and rerouting transactions to branches, subsidiaries, or correspondent banks on the continent. Consider the case of a London-based institution that does not have the necessary liquidity to make the payment in TARGET and demands that its branch or subsidiary in the euro zone obtain it. The parent bank will need to make sure that the branch has a portfolio of eligible securities large enough to secure intraday credit from the ESCB. This might involve a first additional step (and the related additional costs) of transferring a portfolio of eligible securities to a securities settlement system in the euro area under the branch (or subsidiary) name. Once the branch obtains the necessary intraday

liquidity from the ESCB, it will need to send it immediately through TARGET—or through another payment system—to the parent institution. This will be a second additional step, and it will involve the payment of a transaction fee in TARGET or in the alternative payment system that the branch might use. In the latter case, some risks might also be involved. Even if this second step is avoided by having the branch send the payment directly to the receiving bank, an additional (reverse) transaction might be necessary to transfer back liquidity to the branch before the end of the day, when it will need to reimburse the intraday credit to the ESCB.

All of the above considerations suggest that it is possible that TARGET may not fully achieve the intended objective of minimizing systemic risk. Two key features of TARGET will have to be reconsidered, the requirement of full collateral for obtaining intraday credit and the full-cost-recovery principle on which TARGET pricing is based.[9] The implication is that systemic-risk benefits associated with the RTGS features of TARGET might not be captured if the overwhelming majority of transactions is channeled through private and quasi-public netting systems.

This potential relative loss of benefits might be counterbalanced by several factors: (1) some of these systems (such as EAF) would avoid the accumulation of large net exposures by introducing intraday settlement; (2) all of the systems would have to satisfy Lamfalussy standards for clearing houses; and (3) in case of gridlock in one of these netting schemes, payments could always be rerouted toward TARGET, which could play the role of "payments system of ultimate resort." Decentralized oversight of a system like EAF, however, which is currently attributed to the Bundesbank, would be inadequate in the event that such a system attracted most EMU cross-border payments and had participants from all the countries in EMU. The oversight of EBA, by contrast, is attributed to the ECB.

Another potential problem is that despite sophisticated risk-management systems and burden-sharing rules for members, some of these netting settlement systems will be considered to be too big to fail and will have to be underwritten and guaranteed by their respective governments. A less costly alternative for managing these risks might be to encourage the use of TARGET by abandoning the policy of full-cost

[9] The implications of the full-cost-recovery principle are somewhat unclear, because a number of key aspects remain uncertain. One is that the horizon on which it should be applied has not yet been defined. Another key difficulty is that pricing cannot be finalized until the total cost of the system and the likely volumes are known.

recovery and by reducing the need for using collateral to obtain intraday credit, perhaps by charging fees instead, as Fedwire does. Another possibility would be to try to make TARGET more attractive while satisfying the cost-recovery principle. This could perhaps be accomplished by taking advantage of the unique features of TARGET, which would allow it to offer additional services rather than to lower the per-unit fees. Having the bulk of high-value payments settled in real time would minimize the potential for problems in one European bank or banking system to cascade throughout the euro zone.

The TARGET system would not eliminate systemic risk from EMU payments systems, even if it could attract the bulk of large-value payments. This is so because "some RTGS systems linked to TARGET offer their customers queuing and queuing-matching facilities, in some cases combined with queue transparency" (EMI, 1997d, p. 3-3). Queuing would dilute the finality of payments and reintroduce some systemic risk in TARGET if receiving banks act on the assumption that payments pending in the queue will carry through. No easy solution exists for this problem, because the greater risk associated with queuing facilities needs to be balanced against the greater efficiency brought to the payments system by the valuable information about pending payments (Giannini and Monticelli, 1995). In addition, until the May 19, 1998, "Directive on settlement finality in payment and securities settlement systems" is implemented in all EMU countries (the deadline is December 11, 1999), some systemic risk will remain in both netting and RTGS payments systems—as well as in securities settlement systems—because insolvency procedures have a retroactive effect (see Appendix A).

Payments systems are not the only part of the EMU financial infrastructure that may be subject to systemic risk. Securities settlement systems for both domestic and cross-border transactions are another, possibly greater, source of systemic risk. In the case of domestic transactions, although several securities settlement systems will offer intraday delivery-versus-payment (DVP) procedures by January 1, 1999, thus eliminating principal risk, only a few of them will offer real-time settlement before 2002 (ECB, 1998c). As a result, even domestic securities transactions will not be completely free of liquidity risk. Some securities settlement systems will try to manage this risk by offering settlement guarantees, securities-lending facilities, assured payments, and credit facilities. Cross-border delivery of securities between the participants of two different securities settlement systems will initially be free of payment, with DVP links between systems to be introduced only at a second stage (BOE, 1997, pp. 25–28). Moreover,

although the ECB has set a series of minimum requirements for securities settlement systems, their oversight remains largely at the national level, with no framework yet in place for cross-border cooperation. This implies that, unless a rapid consolidation of these systems and central securities depositories accompanies the integration of EMU capital markets, it is likely that a growing number of (cross-border) securities transactions will be settled without intraday finality and without the involvement of any central institution capable of assessing the systemic risk in case of a settlement failure. Because of the liquidity interdependence between payments and securities systems,[10] these failures may also generate large, and time-concentrated, settlement pressures in TARGET or in the prevailing payments system in EMU.

Pan-European Money Markets and the Role of the ESCB

The risk that TARGET might process a small share of high-value payments opens up the possibility that EMU money markets, and in particular a pan-European interbank market, will play a more central role in liquidity risk management. One of the unknowns is how European banks will organize short-term-credit markets. Whether cross-border interbank transactions will be on a secured or an unsecured basis will have implications for both private and systemic-risk management. If cross-border interbank lending were predominantly on a secured (collateralized) basis, for example, because of the relatively rapid development of an EMU-wide repo market, interbank lending would be reasonably safe. This would imply that the risks of systemic events associated with credit problems would remain low, even if banks were to decide to use netting schemes and correspondent banking, rather than TARGET, to settle repurchase transactions.[11] If cross-border interbank lending were to remain uncollateralized, however, the risk of systemic events associated with interbank transactions would be somewhat higher than it is today, because the introduction of the euro is expected to raise the volume of cross-border transactions and to make the assessment of interbank counterparty risk more difficult.

It is likely that unsecured lending will prevail, at least at the beginning of EMU, given the current organization of cross-border interbank

[10] On the interrelations among RTGS and other payment and settlement systems, see BIS, 1997, pp. 33–37.

[11] Collateralized lending does not fully insulate the system from systemic risk if the exposures of a problem institution (such as Long-Term Capital Management) are so large that a simultaneous selling of collateral would disrupt financial markets and produce large adverse price movements that devalue the collateral.

lending in Europe and the prevalence of interbank deposits over interbank repos in all European countries.[12] Because cross-border payments are likely to remain more expensive than domestic payments (certainly in TARGET, but probably also in the competing systems), only large intermediaries will find it profitable to arbitrage liquidity across EMU. As a result, the EMU interbank market will probably be organized in a "hub and spoke" fashion. Each national banking system will have a relatively small number of large banks that will either absorb or supply liquidity within its domestic market while supplying or absorbing liquidity from the larger banks in other countries through cross-border transactions. These cross-border relationships will ensure a single EMU interbank rate by means of cross-country arbitrage. In principle, the reach of the TARGET network will also permit the development of an alternative "consolidated" structure of the interbank market in which both small and large banks would exchange cross-border interbank funds. Such an arrangement is unlikely at least initially, however, because it would require small banks to engage in costly credit-risk assessment of unfamiliar, smaller banks across EMU.

A final option is that of a "money center" structure, in which one center might become so efficient in supplying transactions and settlement services that a critical mass of the major banks (and large corporations) would channel their transactions (and perhaps move their treasury operations) to this location.

Although domestic repo markets are growing rapidly in several countries, the prospects of an EMU-wide repo market are uncertain. Cross-border collateralized interbank lending is therefore expected to develop slowly. Cross-border repo transactions will remain difficult because of delays in developing links between national securities settlement systems and remote access to them, which will be possible—thanks to the use of the correspondent banking model between NCBs—only for the settling of the securities leg of monetary-policy operations. The diversity of legal features of repo contracts is also likely to be an important obstacle to an EMU-wide repo market.

The pressures created by the development of EMU capital markets may bring about a consolidation of securities settlement systems that will encourage the rapid development of an EMU-wide repo market. This consolidation can take different forms. One possibility is that repo

[12] In 1996, French banks were the largest user of repos in continental Europe, accounting for 37 percent of the total interbank treasury product mix (interbank deposits plus repos). They were followed by the banks in Spain, with 27 percent; in Germany, with 13 percent; and in Italy, with 9 percent (Associazione Bancaria Italiana, 1997).

markets may develop in association with the emergence of a few international central securities depositories in which most EMU bonds would be deposited. The two large international European depositories, CEDEL and Euroclear, are already making the necessary preparations to overcome the legal obstacles of a single repo contract for EMU as a whole, but at present, they have bonds of only a subset of the EMU countries on deposit. Another possibility is that the interbank market will follow the money center model and create the strong incentive to transfer settlement operations, together with cash-management operations, to the center; the domestic repo market of this money center would then become the main repo market within EMU. In both instances, a truly integrated EMU-wide repo market will be possible only if bonds of enough EMU sovereigns are fungible. Whether or not this will be the case depends on what type of euro treasury securities will be deliverable against euro treasury futures.

What kind of policies might reduce systemic risk in EMU interbank markets? Besides encouraging the use of TARGET, EMU governments and central banks could promote the wider use of secured interbank transactions by pursuing policies that would foster the development of an EMU-wide repo market. This would include completing the links between national securities settlement systems and allowing remote access to them, as well as harmonizing legislation and regulations to eliminate the differences that prevent the use of an EMU-wide repo contract. But it might also be necessary for the ESCB to play the role of "lender of last resort of securities"—as central banks in the United States and Spain already do— by conducting securities-lending operations, securities swaps, or sell-buy-backs. In the United States, the Federal Reserve Bank of New York (FRBNY) lends government securities to primary dealers in the event of a "fail," that is, a situation in which a firm is unable to deliver a security on time. This operation is fully collateralized,[13] and it amounts to a swap of two government securities, one of which is temporarily in short supply. The Bank of Spain conducts similar operations in the form of sell-buy-backs (that is, the security is lent against cash collateral), but it is about to switch to a securities swap similar to that used by the FRBNY. These operations are not only useful in the event of tensions in the government-securities markets (the FRBNY, for example, eased the conditions for securities

[13] "The dealer must pledge to the Federal Reserve other U.S. government securities in an amount with market value (including accrued interest) that exceeds the value of the borrowed securities plus accrued interest in the borrowed securities" (FRBNY, 1988, p. 2).

lending during the 1987 stock market crash; see Garcia, 1989, pp. 152–153); they might also smooth the operations of an EMU-wide repo market, in which government securities of some EMU sovereigns may be in short supply.

Another way of strengthening the infrastructure of EMU interbank markets would be to reassess the adequacy of existing prudential liquidity requirements and possibly to harmonize them across EMU. Existing requirements vary in purpose and scope, ranging from those aimed at guaranteeing the survival of an illiquid institution over a relatively short period of time (United Kingdom) to those guaranteeing that the maturity of assets and liabilities is matched over a one-year horizon (Italy).[14] Whereas some harmonization would probably be beneficial, any strengthening of the liquidity requirements in EMU—by not allowing, for example, banks to use the liquid assets held to obtain intraday credit—would imply a difficult balancing act between the direct benefits of greater resilience of financial institutions to liquidity shocks and the indirect costs of even greater disincentives to using TARGET because of its higher collateral charges.

European Bank Restructuring and the Need for Crisis Management in EMU

The introduction of the euro is generally expected to speed up the ongoing restructuring and consolidation of European financial systems (IMF, 1997, pp. 205–208). This restructuring can have implications for the stability of EMU banking systems and for European-wide financial markets as competitive pressures intensify, especially if such pressures lead to excessive risk taking. European financial institutions that provide retail services at the local level may find it difficult to maintain current levels of profitability as competition increases and interest-rate margins narrow. Similarly, the decline in foreign-exchange-trading revenues from the introduction of the euro and the emergence of European-wide interbank money, repo, and securities markets may adversely affect profitability of financial institutions that provide wholesale services. In addition, continued progress in information technology will create new distribution channels for banking products and make the excess banking capacity in many EU countries increasingly trans-

[14] The prudential liquidity regime introduced by the Bank of England in January 1996 was designed to ensure that any bank that gets into difficulties has enough liquid assets to meet its requirements for liquidity over the next five business days. The idea is that a bank in difficulty can survive if denied access to the wholesale market completely over the five days and if it experiences a withdrawal equal to 5 percent of its retail deposit base.

parent and burdensome. Moreover, if EMU is accompanied by a rapid expansion of EMU-wide capital markets (IMF, 1997, pp. 188–199), ongoing disintermediation—currently reflecting mainly demographic and social changes—might accelerate, with funds shifting from banks to institutional investors. Overall, the pressures for consolidation and the creation of EMU-wide financial groups and alliances with nonbank intermediaries are likely to increase.[15]

It is an open question whether bank restructuring can take place within Europe in an orderly, market-oriented, and economical way or whether banking problems are likely to emerge that require further injections of public funds. Existing regulations, union strength, and extensive public ownership make it difficult to close banks and to reduce costs through downsizing. In such an environment, restructuring and consolidation may not be possible, and the potential cost savings related to capturing economies of scale might not be fully realized or realized at all. The inability to reduce costs may provide incentives to improve profitability by engaging in activities that have higher, but more volatile, expected returns—which can lead to a growing number of insolvent banks. This scenario is by no means unavoidable, and the forms and the extent of the needed restructuring may vary across EMU. The experience of the United States and the Nordic countries, where banking crises preceded restructuring, and the more recent experience with financial-system problems in Japan, suggest that, in the absence of reforms, European bank restructuring is not likely to occur to the extent that is desirable without tensions. Given these additional pressures, it is advisable that the financial-policy framework within EMU—encompassing the ESCB, national supervisors, and national treasuries—include efficient mechanisms for crisis management, with explicit lines and sharing of responsibilities among authorities, and with the capability of identifying rapidly systemic problems within pan-European financial institutions and across European-wide financial markets.

[15] This scenario is broadly in line with the results of the survey conducted by the EMI (1998, pp. 76–78) in 1997 on current trends in EU banking systems.

3 LENDER-OF-LAST-RESORT RESPONSIBILITIES IN EMU

The structure of European financial policymaking and of the ESCB is set down in the Maastricht Treaty. The framework for banking supervision and regulation is laid down in EU directives, including the Second Banking Directive, the Capital Adequacy and Solvency Directives, and the BCCI Directive. Competence for banking supervision and regulation remains with the national authorities, which in the EU may be NCBs, non-central-bank bodies, or both, depending on the country (see Appendix C). The basic EU principle of "home-country control" coupled with cross-border cooperation among supervisors will initially continue to be applied in EMU. The ESCB Statute (Art. 25[1]) and the Maastricht Treaty (Art. 105[4,5,6]) together assign some relatively vague responsibilities to the ESCB in the areas of prudential supervision and financial stability.[1] The 1997 *Annual Report* of the EMI (1998, pp. 61–63) explains how the EMI and the Banking Supervisory Sub-Committee expect these provisions to be implemented in EMU. The report indicates that any transfer of supervisory powers to the ECB is, at this time, considered to be premature. By contrast, the ESCB is given an explicit role in promoting the smooth functioning of the payments system (Art. 105[2]) of the Treaty), and the ECB "may make regulations to ensure efficient and sound clearing and payment systems" (Art. 22 of the Statute).

The assignment of responsibilities in the Maastricht Treaty and other EU official documents suggests that the framers of EMU did not envision a centralized mechanism for dealing with European financial

[1] Article 25(1) envisions a specific advisory function for the ECB in the field of European Community legislation relating to the prudential supervision of credit institutions and the stability of the financial system. Article 105(4) contemplates a somewhat stronger role for the ECB by stipulating that it must be consulted on draft Community and national legislation falling within its field of competence. Article 105(5) makes clear that the role of the ESCB is subordinate to that of the competent supervisory authorities by indicating that the ESCB is expected "to 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." Article 105(6) limits the role of the ECB in the area of prudential supervision to "specific tasks" that the EU Council may confer to it on a proposal of the European Commission.

and banking problems and did not foresee the need for a centralized crisis-management mechanism. In part, this omission reflects the "narrow" concept of central banking envisioned in the Maastricht Treaty (Mishkin, 1993; Monticelli and Viñals, 1993; Folkerts-Landau and Garber, 1994). The ECB has a mandate to focus almost exclusively on monetary policy and, in particular, on price stability. Although it has been assigned some regulatory functions related to the operation of the TARGET payment systems, the ECB has only a limited, peripheral, and loosely defined role in banking supervision. Neither the Treaty nor the Statute give the ECB an explicit mandate to provide emergency liquidity support directly to individual financial institutions. A broad concept of central banking would include other financial-policy functions such as an explicit mandate to ensure financial stability, provide emergency liquidity support to financial institutions, and supervise systemically important financial institutions (with access to the payments system). In implementing the vision of the Treaty, the ECB has been organized to facilitate the functioning of TARGET and ESCB monetary-policy operations, and it has clearly separated the work on the latter from its work in the areas of banking supervision and financial-market stability. More generally within the EMU framework, the broader decisions about crisis management, and, specifically, LOLR responsibilities, have been left unstated, although there most likely are some unpublicized understandings among policymakers, at least through memoranda of understanding about how crises might be managed. Neither the ECB nor any other EMU-wide institution has been assigned a statutory mandate to coordinate crisis management or to assume LOLR responsibilities. Thus, there is, at present, uncertainty about whether, in the event of a banking crisis across pan-European markets, there will be a central provider or coordinator of emergency liquidity or whether these functions will remain decentralized.

Within this institutional framework, it is unclear how a fast-breaking liquidity crisis will be handled if it involves a pan-European financial institution for which supervisory, regulatory, and LOLR responsibilities will be shared to some extent. The issue is what the ECB or NCBs will do if it becomes apparent that a financial institution cannot meet its financial obligations because its eligible assets are insufficient to obtain the necessary liquidity from the ESCB and its failure may have systemic implications across EMU.

4 CRISIS MANAGEMENT: THEORY AND PRACTICE

This chapter considers the principles on which the involvement of central banks in LOLR responsibilities can be justified, actual practices in selected advanced countries, and the theory and practice of crisis management in Germany.

Theory: Two Views of the Role of Central Banks

The provision of central-bank liquidity to individual institutions in emergency situations can have implications for both monetary and financial stability. The manner in and conditions under which such funds are provided to individual institutions, moreover, can also affect moral hazard and fiscal policy. Because these matters are complex, there is no conceptual framework for the provision of liquidity assistance during emergency situations (that is, financial crises) that is uniformly viewed as appropriate by practitioners and academics, and there is a wide range of industrial-country practices. In most countries, financial safety nets have two key elements, namely, a lender of last resort, whose responsibility is usually—but not always—assigned to the central bank, and a deposit-insurance scheme.[1] Although LOLR interventions by central banks are common practice, they have been frequently criticized because they might (1) have moral-hazard implications, (2) affect the central bank's financial condition, and (3) conflict with monetary- (price-)stability objectives.

To minimize these risks, central banks can follow a set of "best" practices. Bagehot (1873) set the benchmark over a century ago. The application of his doctrine would require that a central bank (1) make LOLR facilities available to the entire financial system but lend only to illiquid institutions that are solvent, (2) let insolvent institutions fail, (3) lend speedily, (4) lend only for the short term, (5) charge penalty interest rates, (6) require good collateral, and (7) announce these conditions well in advance of any crisis, so that the market will know

[1] The IMF (1998) describes LOLR policies as typically having three primary objectives: (1) to protect the integrity of the payments system, (2) to avoid runs that spill over from bank to bank and develop into a systemic crisis, and (3) to prevent illiquidity at an individual bank from unnecessarily leading to its insolvency. By contrast, the primary objective of a deposit-insurance scheme is to prevent self-fulfilling runs on deposits and to provide a safe asset to small savers.

exactly what to expect. These "best" practices are still generally considered valid (see IMF, 1998, box 2, p. 28).

In principle, strict adherence to Bagehot's rules would alleviate most, if not all, concerns about central-bank involvement in LOLR operations. Lending only to solvent institutions, at penalty rates, would eliminate the risk of moral hazard, and lending against good collateral would insure against losses. Moreover, lending only for the short term would limit the inflationary consequences of LOLR intervention.

In practice, three factors complicate the implementation of Bagehot's guidelines. First, in the midst of a crisis, the information available is generally insufficient to allow for an unambiguous distinction between illiquid institutions that are solvent and institutions that are insolvent, or between "bad" and "good" collateral. Second, if a crisis has systemic implications, authorities might tend to bail out insolvent banks to prevent the failure of other, potentially solvent, banks or the collapse of the financial system. Third, if a part of the banking system is allowed to fail, the authorities may find it even more difficult to achieve macroeconomic objectives, including monetary, price, and fiscal stability, in part because a loss of confidence can alter private-sector behavior (Goodhart and Huang, 1999).

These three factors can interact, worsen a crisis, and complicate crisis management. If imperfect information forestalls a clear delineation of insolvent from solvent institutions, a local crisis can become systemic as market participants fail to distinguish good from bad institutions and good from bad collateral, and assume all are bad. At the same time, asymmetric information and asset mispricing can make it difficult to limit moral hazard by providing LOLR assistance only to illiquid and systemically important institutions. Moreover, if liquidity assistance is provided to insolvent institutions against bad collateral—in order to contain the systemic implications of the crisis—the central bank might endanger its own financial position. Finally, if the confidence effects of a crisis are miscalculated, the central bank can risk choosing a monetary policy that may be too tight, as in the 1930s, or too loose, as in the period after the 1987 stock market crash.

Thus, the moral-hazard and monetary-stability outcomes associated with LOLR interventions mainly reflect the (increased) degree of imperfect information available to central banks in emergency situations. If central banks had access to perfect information and were equipped to evaluate it rapidly, they could limit and manage the systemic consequences of a crisis with limited moral hazard. In cases of payments systems crises, for example, central banks could rescue banks selectively

by providing temporary liquidity assistance to solvent lending banks only. By refusing such assistance to insolvent debtor banks and letting them fail, they would allow the bank management and shareholders to bear the full consequences of the bank's financial condition (Rochet and Tirole, 1996). Similarly, perfect information about the confidence effects of bank failures would allow central banks to fine-tune their monetary policies and achieve their macroeconomic objectives.

Realistically, central banks do not have access to perfect information, and there are very high and costly informational requirements for distinguishing between solvent and insolvent institutions and for selecting the appropriate monetary policy in a crisis. These costly requirements raise the issue of whether central banks can justify their LOLR role, not only by showing that they have better information than market participants, but also because LOLR interventions yield benefits in excess of the costs of (1) the supervision and regulation necessary to acquire superior information, (2) moral hazard, the costs of which remain as long as the supervisory information in the hands of central banks is imperfect, (3) reduced peer monitoring among market participants because of the central banks' LOLR role (Rochet and Tirole, 1996), and (4) potential monetary-policy errors resulting from LOLR intervention.

In practice, the pivotal issue is whether a central bank should distribute liquidity by screening strong from weak banks and assessing the systemic implications of bank failures, or whether it should simply provide liquidity to the market, leaving the allocation of liquidity to market participants, and focus exclusively on providing liquidity to the system against well-defined collateral, for example, government paper. The academic and policy literatures hold two distinct views on this issue. At one extreme, is the "market-operations" approach. According to this view, in order to avoid moral hazard, a central bank should supply emergency liquidity to financial markets (not individual institutions) through its open-market operations—accepting government securities as underlying assets.[2] A simple interpretation of this strategy is that central banks should be concerned only with monetary stability, and financial stability will naturally follow.

At the other extreme is the "banking-policy" approach,[3] which favors a more interventionist financial-stability role for central banks, on the

[2] Marvin Goodfriend and Robert King (1988) argue that control of high-powered money alone is sufficient to deal with liquidity crises.

[3] Goodfriend and King (1988) define a central bank's banking policy—as opposed to monetary policy—as involving (1) its regulatory and supervisory actions or (2) changes in the composition of the asset side of the central bank's balance sheet, holding the total fixed.

assumption that there is a strong relation between achieving and maintaining monetary and financial stability. This view rests on three main arguments. First, market failures may preclude the fast and reliable channeling of liquidity to illiquid, solvent institutions. Second, widespread failures of financial institutions may affect the confidence and behavior of the private sector so unpredictably that the conduct of monetary policy solely by means of open-market operations will become extremely difficult. To continue basing monetary policy on predictable relationships, central banks may then follow some sort of too-big-to-fail policy and bail out sufficiently large illiquid institutions regardless of their financial condition and viability (Goodhart and Huang, 1999). Third, central banks can reasonably contain the moral-hazard implications of such policies by following the practice of "constructive ambiguity."[4] An additional point often made by those favoring a banking-policy approach is that central banks are likely to be involved in most instances of banking crises, including those regarding insolvent institutions, because they are generally the only source of immediate funds. Whether central banks will be the ultimate source of funds depends on arrangements between them and the regulatory agencies, treasuries, and deposit-insurance schemes.[5] Although central banks may be indemnified, they might initially have to provide funds to insolvent institutions, and possibly even to institutions that are not systemically important (as occurred in Japan in November 1997) if the responsible authorities decide that they should be intervened. It is evident that the faster a crisis occurs, the more likely this scenario becomes.

Although the banking-policy approach seems to be more consistent with the historical experiences of many, if not most, industrial countries, the market-operations strategy provides a conceptual benchmark for examining the EMU framework. In many respects, this framework seems to reflect the market-operations approach of providing liquidity to the economy by using only open-market operations to smooth interest-rate movements and a Lombard (that is, a strictly defined collateralized) facility to provide emergency liquidity assistance at a "penalty" rate. This approach contrasts with the discount-window policy of the U.S. Federal Reserve System, which gives considerable leeway

[4] Constructive ambiguity is discussed below. Goodhart and Huang (1999) provide a rationale for it, whereas Giannini (1999) emphasizes its key role in controlling moral hazard when central banks cannot easily separate illiquid from insolvent banks.

[5] Goodhart and Schoenmaker (1995a) make this point based on a sample of 104 major bank failures in several industrial countries.

to the Federal Reserve in selecting eligible collateral and counterparties, and which allows loans to be made at a subsidized rate.

An important reservation about the market-operations view is that it does not address systemic or contagion risk—defined as the risk that financial difficulties at one or more bank(s) will spill over to a large number of other banks or to the financial system as a whole. If the failure of a troubled institution has systemic implications, and if it is impossible to distinguish its insolvent from its solvent but illiquid creditors in a short period of time, a central bank might want to provide funds to the struggling institution even if solvency is an issue and even if it does not have adequate collateral. Bagehot (1873, pp. 51–52) was concerned about systemic risk: "In wild periods of alarm, one failure makes many, and the best way to prevent the derivative failures is to arrest the primary failure which causes them." The pre-Federal Reserve period in the United States is instructive because it offers a rare opportunity to test hypotheses using data that are not distorted by the presence of a public safety net. According to the market-operations view, the successful functioning of clearinghouses in this period provides evidence that, as long as the overall supply of currency can be increased in the event of a crisis, the role of distributing the additional liquidity to individual institutions can be left to the private sector. The evidence is, however, mixed. On the one hand, simple descriptive statistics on failure rates suggest that allowing private clearinghouses to perform LOLR functions does not increase, but rather decreases, systemic risk: the average annual failure rate of banks over the 1870–1913 pre-Federal Reserve period was 0.91 percent compared with 1.01 percent for nonbanks. Conversely, in the 1914–1994 period, the average annual failure rate of banks was 1.09 percent against a rate of 0.65 percent of nonbanks (Kaufman, 1996; Temzelides, 1997). On the other hand, recent econometric studies that control for macroeconomic factors find evidence of contagion risk in the pre-Federal Reserve period (Grossman, 1993; Hasan and Dwyer, 1994; Schoenmaker, 1996).

On balance, the issues are mainly whether the central banks can, in crisis situations that may have far-reaching systemic implications, (1) assess the solvency of illiquid institutions better than the market can and (2) contribute to an orderly resolution of such crises with a limited and tolerable impact on moral hazard and monetary (price) stability. In recent years, the clearest example of the markets' inability to distinguish between illiquidity and insolvency has been the Bank of New York episode in 1985. In this instance, the Bank of New York became

unable to borrow from the money market to meet its liquidity needs, although its difficulties were entirely temporary and caused by a computer breakdown. To prevent the bank's failure and the related systemic implications, the Federal Reserve provided collateralized overnight credit equivalent to more than 10 percent of the U.S. monetary base (Folkerts-Landau and Garber, 1992). In other instances, central banks—usually the only immediate providers of liquidity—might have to inject liquidity into undercapitalized and perhaps even insolvent too-big-to-fail financial institutions in order to ensure an orderly resolution of financial problems or crises before they become systemic (that is, in order to maintain or restore financial stability). In such cases, although central banks are usually the only immediate source of liquidity, other public institutions, or consortia of private banks, can and should bear the ultimate costs of the bailout.

Practice: Country Experiences with Crisis Management

Central banks clearly differ in their approaches to crisis management and in their willingness to use central-bank funds. In intervening in support of the banking system, the evidence suggests that the Bank of England has been willing to provide LOLR support whenever it has believed that a failure will have systemic implications, no matter whether the troubled institution is fully solvent and adequate collateral is available. That the Bank of England follows such a policy is evident from the losses it incurred on the guarantees extended to small banks in 1991, for which it had to make provisions of £95 million. On that occasion, several clearing banks withdrew wholesale funds from small banks and building societies and created funding pressures for some midsize banks. The Bank of England provided indirect liquidity support in the form of guarantees, without which clearing banks would have refused funds to troubled banks. When liquidity difficulties in some banks developed into a solvency problem, the Bank of England made provisions for the losses related to the guarantees. The guarantees were not widely known until the provisions were announced, because neither the Bank of England nor the clearing banks made them public.

The rescue operation of Johnson Matthey Bankers Ltd. (JMB) in 1984 allowed the Bank of England to recoup most of the losses associated with the £150 million indemnity that it provided. The definition of solvency used by the Bank of England was an extended definition, because the initial losses on the indemnity were recouped only after some time, when the rescue operation—also involving other participants in the gold market where JMB had an important position—was

completed. The cases of the Bank of Credit and Commerce International (BCCI) and Barings indicate that the Bank of England is ready to let insolvent institutions fail, whenever their failure is not viewed as representing a systemic risk.[6]

In the United States, discount-window lending is the main tool used for LOLR operations.[7] Discount-window lending differs from repurchase operations not only because of the subsidized rate that has characterized its use in recent years, but also because of the kind of collateral that is eligible. Whereas only Treasury securities can be used for repos, a much wider range of financial instruments is acceptable as collateral for discount-window loans; these instruments include corporate bonds and money-market instruments, collateralized mortgage obligations, residential mortgage notes, and commercial, industrial, and agricultural notes. In addition, "Reserve Bank staff can . . . discuss other types of collateral that may be acceptable" (Board of Governors, 1994, p. 8). Since 1980, the Federal Reserve has been allowed to lend to any depository institution (bank or thrift), but thrifts must turn to their special security lenders before approaching the U.S. Federal Reserve. Nondepository institutions generally have to use their commercial banks as lenders of penultimate resort. In addition, there is a "provision of the Federal Reserve Act which allows Federal Reserve Banks (upon an affirmative vote of at least five members of the Federal Reserve Board) to make loans to individuals, partnerships, or corporations for short periods of time if the latter cannot get sufficient credit from commercial banks. But to qualify, borrowers must be creditworthy, and the loans must be secured by collateral acceptable to the Reserve Bank" (Brimmer, 1989, p. 5).

In practice, the U.S. Federal Reserve System has recently followed a policy of lending only to depository institutions and of letting them channel funds to other troubled institutions, even when the latter are at the origin of the crisis, as in the case of the Penn Central Railroad bankruptcy in 1970, the problems at Prudential Bache (a leading broker-

[6] Also in the case of Barings, however, the Bank of England announced, after deciding not to support the bank and before the London markets opened, that it would "stand ready to provide liquidity to the banking system to ensure that it continues to function normally" (Schoenmaker, 1995, p. 12).

[7] Gillian Garcia (1989) discusses a number of other quasi-LOLR procedures used by the Federal Reserve that are both well known (public pronouncements and open-market operations) and less well known (contingency planning, information gathering and agency coordination, daylight overdrafts, securities lending, and counseling).

dealer in securities) during the 1980 silver speculation, and the near failure of clearing and settlement systems in the 1987 stock market crash. In some of these instances—as well as in some of the main banking-sector crises, namely, of Franklin National in 1974, of SeaFirst and Continental Illinois in 1984, and of the Bank of New York in 1985—the Federal Reserve is likely to have accepted nongovernment securities as collateral for discount-window loans. The Federal Reserve Board's policy of not commenting publicly on discount-window use, even well after the event, makes it difficult to know whether the FRB incurred any losses as a result of its LOLR operations, which were often sizable ($4.5 billion for Continental Illinois; $22.5 billion for the Bank of New York).

In the case of Continental Illinois, the objective of the Federal Reserve's intervention was to contain the systemic consequences of the bank's failure. Contagion effects could have been sizable because Continental had numerous credit links with the rest of the banking system by way of the federal-funds market and correspondent balances. Specifically, nearly 1,000 banks had (uninsured) deposits with Continental, which represented more than 100 percent of the capital of 66 of them and between 50 and 100 percent of the capital of another 113 of them (Schoenmaker, 1996).

The 1987 stock market crash involved nondepository institutions and illustrates how difficult it can become to determine whether a financial institution is insolvent or illiquid in the short time-horizon in which LOLR decisions need to be taken. During the 1987 crash, price movements were so large that differences in the timing of the settlement of margin obligations among the stock, options, and futures markets, coupled with settlement delays, created an extraordinary demand for liquidity by traders and brokerage firms. Even traders with positions that were perfectly hedged in the options market needed a large amount of interim liquidity to meet intraday margin calls in the futures market. To satisfy the demand for liquidity, traders and brokerage firms were asking commercial banks to increase their credit-line limits at a time when they were potentially experiencing large losses. In this situation, the Federal Reserve made the discount window available to commercial banks and encouraged them to increase credit-line limits to traders and brokerage firms.[8]

[8] As a result, total discount-window lending to New York banks increased, and "weekly reporting banks in New York City expanded their loans to brokers and to individuals to purchase or carry securities from $16.7 billion in the week ending October 7 to $24.4 billion in the week ending October 21" (Garcia, 1989, p. 152).

From the point of view of this study, an important aspect of the 1987 episode is that, although the volatile environment was making credit assessments extremely difficult, the commercial banks and the Federal Reserve had to decide—probably in less than one hour—whether to allow traders and brokerage houses to default by not meeting intraday margin calls. In this instance, the Federal Reserve is believed to have exposed itself to a potentially large amount of credit risk by encouraging banks to increase credit-line limits and to use the discount window. It remains an open question whether the necessary liquidity could have been injected using only open-market operations, as was partly done. An important question is what the Federal Reserve would have done if clearing and settlement systems had worked without a glitch, so that any increase in liquidity demand could have been interpreted as reflecting losses that traders and brokerage houses were incurring, rather than delays and synchronization problems in settlement systems. Finally, the 1987 episode confirms that the Federal Reserve considers settlement risk—together with liquidity risk, and as opposed to credit and market risk—as a risk it is willing temporarily to insure, just as it does by granting intraday credit in the form of daylight overdrafts in Fedwire.

More recently, in September 1998, a private consortium of the creditors of the hedge fund Long-Term Capital Management (LTCM) was "facilitated" by the Federal Reserve Bank of New York to avoid a potential systemic problem. In this case, a run on the collateral of LTCM by its creditors could have disrupted financial markets and weakened the financial condition of other important financial institutions. The private rescue by creditors was orchestrated to allow for a more orderly unwinding of LTCM's positions.

Central banks of many other industrial countries have provided various kinds of support to troubled or failing banks (see Goodhart and Schoenmaker, 1995b, appendix 3, for most of the following examples). In the past, the Bank of Japan (BOJ) granted concessionary loans to a troubled bank (the Togo Bank in 1991) and gave access to subsidized credit as part of a plan to accelerate the write-off of bad loans (the Cooperative Credit Purchasing Company in 1992–93). More recently, the new Bank of Japan law (1997), which was the basis for the bank's interventions during the crisis in November and December 1997, identified three ways in which the Bank of Japan could provide liquidity to the system, with the objective of ensuring "a smooth settlement of funds among banks and other financial institutions, thereby contributing to the maintenance of an orderly financial system" (BOJ, 1997, Art. 1).

One way is to provide, on a regular basis, liquidity against collateral. Eligible assets include government and private bonds, commercial bills, other negotiable securities, and gold (BOJ, 1997, Art. 33). A second possibility is to provide uncollateralized loans to financial institutions that "unexpectedly experience a temporary shortage of funds for payment due to accidental causes, including computer system problems, . . . provided that the advance is necessary to secure the smooth settlement of funds among financial institutions" (BOJ, 1997, Art. 37). A third possibility is to provide liquidity under special conditions upon request of the Ministry of Finance "when it is believed to be especially necessary for the maintenance of an orderly financial system" (BOJ, 1997, Art. 38). In practice, this last article has been used to provide "bridge liquidity" for unwinding the business of institutions about to be closed down, as, for example, the Yamaichi and Hokkaido Takushoku Bank in late 1997. In these cases, the presumption is that the Ministry of Finance will be the ultimate provider of funds—although no specific provision to this effect is included in the Bank of Japan law.

The Bank of Canada also granted liquidity support on several occasions, by giving advances to troubled banks and public assurances that it would provide all the necessary liquidity.[9] The Danish central bank (Dansmarks Nationalbank) offered guarantees (to the Kronenbanken in 1985), gave unsecured liquidity support (to the C&G Banken in 1987), and in one case, both granted liquidity support and injected subordinated capital (to the 6.juli Banken in 1987). Similarly, the Finnish central bank (Suomen Pankki) injected share capital, guaranteed liquidity, and purchased problem assets of a single troubled institution (the Skopbank in 1991–93), suffering in the end an estimated loss of FM 4.9 billion. The Bank of Greece guaranteed the deposits of a private bank (the Bank of Crete in 1988) that ended up in special administration. The Banca d'Italia on several occasions gave secured special advances at a subsidized 1 percent rate by applying the so-called *Legge Sindona*. This form of subsidy for banks in difficulties was first granted to the Banco Ambrosiano in 1982 and, more recently, to the Banco di Napoli in 1996. The central bank of Norway (Norges Bank) provided liquidity support on several occasions in the 1980s and early 1990s.[10] The Banco de España participated in the bailout of a single bank (the Banca

[9] The banks assisted were the Canadian Commercial Bank (1985), Northland Bank (1985), Bank of British Columbia (1985–86), and Continental Bank of Canada (1985–86).

[10] It assisted the Sørlandsbanken (1980s), Sunnmørsbanken (1988), Fokus Bank (1990–92), Realkreditt (1991), Christiania Bank (1991–92), Den Norske Bank (1991–92), and government bank insurance and investment funds (1991–92).

Catalana in 1982–83), the total cost of which, Ptas 100 billion, was shared with the Deposit Guarantee Fund and a special bank-rescue fund.

Other industrial countries, by contrast, handled banking problems without resorting to central-bank funds. In some instances, troubled institutions were bailed out with funds of commercial banks, governments, or deposit-insurance schemes; in others, they were taken over by financially sound banks; and, in a minority of cases, they were liquidated.[11] In about one-fourth of the cases examined by Goodhart and Schoenmaker, multiple sources of funding were used. But, even when the central bank did not use its funds, it was frequently instrumental in arranging alternative solutions. In some countries, the extensive share of public ownership in the banking system facilitated this moral-suasion role of the central banks. In France, a controversial article of the 1984 banking law (Art. 52.1) even gives the central-bank governor the authority to appeal first for help to the shareholders of the troubled institution and then, if the shareholders do not respond to the appeal and the failure of the bank has systemic implications, to organize a rescue based on solidarity contributions (the so-called *solidarité de place*) from the rest of the banking system (Art. 52.2).

The leeway that a central bank has in accepting collateral is another indication of the extent to which it can exceed its monetary-policy mandate and engage in banking policy, including the management of crisis situations. In most industrial countries (see Borio, 1997, tables 4.6a and A.III.1), as in the United States, the range of assets accepted as collateral at standing facilities (Lombard and discount window) is wider than the range of assets underlying discretionary operations (repos or outright purchases). Notable exceptions are Australia, Canada, and the Netherlands, where the same set of assets is eligible for both types of refinancing operations. In Australia and Canada, only government securities are accepted for both types of refinancing operations. In the Netherlands, a fairly wide range of both public and high-quality private assets is accepted, including government and (good) quality private paper, mortgage bonds, listed shares, and subordinated paper. Private assets are generally accepted alongside public assets at standing facilities (Australia and Canada are the only exceptions), whereas only public bonds tend to underlie discretionary operations.[12] In some countries,

[11] Goodhart and Schoenmaker (1995b) cite examples of such cases in Australia, Austria, Belgium, France, Germany, Ireland, Luxembourg, the Netherlands, New Zealand, Portugal, Sweden, and Switzerland.

[12] This is true in the United States, as well as in Australia, Canada, Denmark, Greece, Ireland, Italy, Spain, and Switzerland.

however, a wide range of assets—including commercial paper and even loans—is also used for discretionary operations, and a few central banks (in Belgium, Greece, Finland, and Sweden) even conduct unsecured credit operations for fine-tuning purposes, mainly in the interbank market (Aspetsberger, 1996, table 6). In France, bank claims on companies given favorable credit ratings by the Banque de France (maximum residual maturity of two years) are accepted for reverse transactions.

An interesting aspect of this evidence is that there seems to be little correlation between the countries that have used central-bank funds to manage banking crises and those that have adopted more liberal eligibility criteria for collateral. In France, for example, although the central bank can accept loans as collateral for open-market operations, no central-bank funds were reported to have been used in the management of banking failures. By contrast, in Canada, the requirement of accepting only government debt as collateral for central-bank advances did not prevent the Bank of Canada from providing funds to insolvent institutions.

Crisis Management in Germany

Because the ESCB Statute is similar to that of the Bundesbank in many respects, the German system is a useful benchmark for examining the way in which crisis management might be structured within EMU. The Bundesbank is widely regarded as a central bank that has been involved in crisis management to the least possible extent. It is generally believed that no Bundesbank funds have been directly used to support troubled institutions in the postwar period. In addition, eligibility criteria for the use of collateral in refinancing operations are strict, and the range of eligible assets for Lombard loans and open-market operations, including both public and high-quality private securities, are equally restricted (Bundesbank Act, Sections 19.3 and 21). An even more limited range of assets, comprising only shorter-term private and public bills, is accepted at the discount window.[13] Although the Bundesbank is allowed, on the basis of its statute, to make some additions to the list of eligible debt securities[14] for open-market operations and the Lombard facility, its leeway is limited compared with that of other major central banks (including the Bank of England, the Banque de France, the Bank of Japan, and the U.S.

[13] This is probably because the discount window is subsidized. Sections 19.1 and 19.2 of the Bundesbank Act define the eligible assets.

[14] See Section 19.3, point e, and Section 21.4 of the Bundesbank Act. No bank loans or equity may, in any case, be accepted as collateral.

Federal Reserve System, which has flexibility in determining eligible collateral for discounting). The Bundesbank thus appears to be the central bank that best fulfills the market-operations approach of focusing exclusively on monetary-policy objectives and avoiding involvement in banking policy.

Conceptually, the German framework for dealing with banking and financial crises appears to be constructed so as to ensure that the Bundesbank focuses exclusively on price stability and avoids directly providing funds for bank-rescue operations. The crisis-management framework in Germany appears to embody three lines of defense aimed at preventing such direct use of Bundesbank funds: (1) banking supervision and regulation by an independent body, the Federal Banking Supervisory Office, (2) deposit-insurance schemes and public guarantees for the publicly owned segment of the banking system, to prevent a run by depositors, (3) brokered market solutions combined with short-term emergency liquidity assistance provided by the Liquidity Consortium Bank (LCB), and, if the liquid resources of the LCB are insufficient, short-term emergency liquidity assistance provided directly by the Bundesbank to the LCB but only if the LCB guarantees the troubled institution.

The LCB, established in 1974 in the wake of the failure of the Herstatt Bank, is a specialized financial institution that is meant to ensure the settlement of domestic and external payments among banks. It grants short-term liquidity assistance to financial institutions that are facing temporary illiquidity but that are judged to be in sound financial condition. The identities of the intervened institutions are publicly revealed neither at the time of the crisis nor after the fact. The Bundesbank holds 30 percent of the LCB's capital (DM 372 million at end-1997); the rest is held by private banks (31.5 percent), savings banks (26.5 percent), cooperative banks (11.0 percent), and installment-credit financing institutions (1 percent). The four-member credit committee of the LCB (one Bundesbank member plus one member for each association of credit institutions) decides on the granting of liquidity support. Banks in need of such support, but with no solvency problems, may borrow from the LCB by rediscounting three-month promissory notes (*Banksolawechsel*).[15] The LCB's partners are obliged, if necessary, to make supplementary payments of up to 5 times their equity stakes, but this option has thus far not been used in the midst of a crisis. If the

[15] To determine solvency, the LCB credit committee would use information from various sources, including supervisory information to which the Bundesbank representative would

liquid resources of the LCB are insufficient, the LCB can use a special rediscount facility at the Bundesbank, which allows it to discount promissory notes that troubled banks have issued and on which the LCB has provided the "second good signature" required by law. New arrangements will have to be made in relation to the discounting of promissory notes in EMU because the discount window of the Bundesbank will cease to exist and banks' promissory notes may not be considered eligible collateral by the ECB.

In principle, these lines of defense appear to limit considerably the involvement of the Bundesbank in judging the solvency of individual financial institutions, in decisions about providing liquidity assistance to illiquid institutions, and in banking supervision. In practice, the Bundesbank would be involved in these situations, all of which go beyond open-market operations and monetary-policy operations. First, the Bundesbank owns 30 percent of the LCB's capital, the remainder of which is dispersed among a large number of various categories of banks within Germany. When the LCB has provided liquidity assistance, its decisions to provide liquidity have required unanimous agreement of its credit committee. Second, and perhaps more important, the success of the Bundesbank in finding alternative solutions to the use of central-bank funds requires it to have direct access to supervisory information. Section 7 of the German Banking Act requires that "the Deutsche Bundesbank and the Federal Banking Supervisory Office shall communicate to each other any observations and findings which may be of significance for the performance of their respective functions" (Deutsche Bundesbank, 1996, p. 32). The Bundesbank (1995, p. 35) specifies in one of its publications that "the Supervisory Office, which has no branches of its own, takes advantage of the Bundesbank's familiarity with local conditions and its relevant expertise. There is a mutual exchange of information, which may be significant for the discharge of the duties each institution has to perform." Third, the existence of the LCB suggests that policymakers in Germany recognize that liquidity problems cannot satisfactorily be tackled exclusively with normal market-based monetary-policy operations. This suggests that German financial policymaking does not wholly subscribe to the monetary-operations view of LOLR responsibilities and that it contains aspects of the banking-policy approach.

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have easy access, given that the Bundesbank representatives (in particular the Landeszentralbanken) often act as agents for the Bank Supervisory Office in collecting supervisory data.

Like the Bundesbank, the ECB has no explicit responsibility for crisis management beyond an advisory role for safeguarding the stability of the EMU financial system. It does not, moreover, have an explicit mandate as a lender of last resort. In some respects, EMU's institutional arrangements—in particular the ECB's dependent and limited access to supervisory information—allows the ECB less scope and flexibility than the Bundesbank has to play a role in market surveillance, the detection of financial problems, crisis management, and liquidity support to single illiquid institutions.[1] The ECB seems to have greater leeway than the Bundesbank, however, in altering the list of eligible collateral.[2] Because of these differences, the EMU and ESCB frameworks imply that the LOLR function within EMU resembles the open-market-operations view of LOLR responsibilities more closely than it resembles the German framework (or any other with which the authors are familiar).

In particular, in EMU, an illiquid bank would use the same eligible assets to obtain intraday credit in the payments system, would bid aggressively for funds in open-market operations, or would access the marginal-lending facility. In the event of a liquidity crisis, the ECB would not have the mandate to assess solvency of an illiquid bank; this would be left to national authorities. The ECB could maintain open and unrestricted access to its marginal-lending facility, but it would then be required to decide whether to sterilize the liquidity impact of any lending, depending on whether the liquidity crisis were local or

[1] In the existing framework, as has been made known to the general public, there seems to be no straightforward way for the ECB to accept noneligible assets from a troubled institution without making that typology of assets eligible for credit operations to the entire system.

[2] As already discussed, in Germany, the Bundesbank's statute specifies the eligibility characteristics of the collateral. This implies that, to accept ineligible collateral, it would be necessary to go through the lengthy process of changing the statute. The LCB is probably a way to reintroduce some flexibility in the management of liquidity crises. By contrast, the ECB Statute (Article 18) only specifies that the ECB's lending should be based on "adequate" collateral, leaving the exact definition of "adequate" to the Governing Council of the ECB. In EMU, a decision of the Governing Council of the ECB would then be enough to change the assets included in the Tier I and Tier II lists of collateral (see Appendix B).

EMU-wide. The ESCB structure implies that there is no prearranged way by which the ECB can quickly and unilaterally provide liquidity to a financial institution that does not have eligible assets.[3] There would seem to be no legal obstacles, however, to setting up an emergency liquidity facility that can lend funds against collateral, albeit of less quality than is required for ESCB operations, at the NCB level, the ECB level (in an ad hoc fashion), or as a separate EMU-wide institution (such as the LCB) outside the ESCB.

Assuming that it was a deliberate decision of the EU framers of EMU to conform closely to the market-operations approach to LOLR responsibilities (or something like it), EMU is unlikely to achieve the main benefits of this strategy, even though it might bear the costs of a reduced ability to cope with a banking crisis. First, according to the market-operations approach, one key advantage of having a central bank that focuses exclusively on monetary policy is that it can eliminate, or considerably reduce, supervisory and regulatory costs. This is unlikely in EMU. Pan-European banking institutions will probably have to deal with eleven different supervisory and regulatory agencies, the practices and regulations of which are still not fully harmonized (see Appendix D). Second, the reduction in moral hazard resulting from a limited involvement of the ESCB in the resolution of banking crises is also unlikely to be realized, because it would be a departure from current practices in most EMU countries, including Germany, and might thus be viewed as not credible. To achieve the desired reduction in moral hazard, banks operating in EU banking systems where there is a clearly defined lender of last resort must change their expectations of assistance within the new EMU lender-of-last-resort regime. But this requires the transition to the new regime to be adequately publicized and clarified. Otherwise, commercial banks will continue to rely on assistance from the NCBs. This would pose the strong risk that limiting the use of ECB funds in the management of banking crises would create a time-inconsistent policy.[4]

[3] The options available are further discussed below. The list of eligible assets includes government paper and, especially in the case of Tier II collateral, assets the quality of which must be assessed by the NCBs.

[4] Goodfriend and King (1988, p. 15) consider this to be the worst possible case, stating that "the government would have to precommit itself not to provide emergency liquidity assistance. The worst possible case would be one in which the government announced its intention not to provide emergency credit assistance in the future, but the banks believed that in fact it would. Then, if a liquidity problem arose, banks would not have prepared for it by holding sufficient capital and by arranging lines of credit. If the government remained true to its policy, widespread insolvency could prevail."

Of course, this would not be an issue if the NCBs were allowed to continue to follow previous LOLR practices according to a fully decentralized arrangement. This possibility is discussed in detail below.

The foregoing analysis raises the question of whether there are viable substitutes to central banks for fulfilling LOLR responsibilities and whether these alternatives are feasible within EMU. In particular, is it pragmatic to manage fast-breaking financial or banking crises within EMU without involving either the ECB, the NCBs, or both. The feasibility of two possible strategies are considered below: (1) a strategy based on a lender of penultimate resort, in which neither the ECB nor the NCBs would use central-bank funds to provide liquidity to individual institutions, and (2) a decentralized approach, in which LOLR assistance is left entirely to the NCBs without involvement of the ECB. Three important implications of the following analysis are that (1) because only central banks can provide unlimited and immediate liquidity assistance in the form of "good" (central-bank) funds, it is difficult to envision a financial safety net that excludes them completely in the midst of a fast-breaking crisis, (2) an option based on a lender of penultimate resort would be impractical during a fast-breaking, EMU-wide financial or banking problem, and (3) an option based on a decentralized strategy would necessarily involve ECB decisions about systemwide liquidity and what the NCB should be allowed to do.

Lenders of Penultimate Resort: LOLR Responsibilities without Central-Bank Funds

Lenders of penultimate resort can reduce the need for central-bank funds. Provided that the necessary political consensus is achieved, relationships can be established between other agencies and the ESCB to limit recourse to the ESCB as the ultimate source of funds. The possibilities for lenders of penultimate resort include deposit-insurance schemes, liquidity consortia, pools of solvent banks, and national treasuries.[5]

There are several reasons why deposit-insurance schemes alone might not be effective in managing a liquidity crisis in an EMU banking system. First, the coverage of most deposit-insurance schemes in EMU would be enough to protect small depositors but not to ensure financial stability (see Appendix E). Second, payouts from deposit-insurance funds are generally very slow, so there would still be a need for an immediate

[5] In the past, public banks and public financial institutions were lenders of penultimate resort, but this role will diminish with the number of public banks.

provider of liquidity assistance.[6] Finally, in an integrated EMU banking system with several EMU-wide institutions, there is the risk that the use of deposit-insurance schemes would take time to determine how the financial responsibilities would be shared among national authorities and could delay the resolution of a problem bank.[7]

The concept of a liquidity consortium is a natural candidate for EMU, because of Germany's success in minimizing the use of central-bank funds and the analogies between the ESCB and the Bundesbank statutes. Nevertheless, there are several reasons why the German method (three lines of defense, with use of central-bank funds only if the consortium guarantees the discounted debt instruments of the troubled bank) might not work within EMU. First, there is no analog to the LCB in other EMU countries, and one is not planned at the EMU level. Second, even if such an institution existed in each EMU country, or an EMU-wide consortium were created, it would seem inadequate in relation to the size and the cross-border systemic implications of a liquidity crisis involving a major pan-European banking group, unless such institutions were endowed with considerable resources and could, with their guarantees, transform ineligible into eligible collateral. Third, the German liquidity consortium never had to face a systemic crisis as large or as complicated as one that might occur in pan-European markets involving pan-European institutions. The German system worked well in an environment characterized by a large share of public ownership in the banking system and capital markets less developed than those that are likely to emerge in EMU. In that environment, crises unfolded "in slow motion" and most likely did not have the same liquidity and systemic implications that a sudden correction in asset prices, or the insolvency of a major financial institution, would have in integrated EMU-wide capital markets. Fourth, the success of the German LCB may have reflected the presence of the Bundesbank, which provided 30 percent of the LCB's capital and a special rediscount facility, along with the Bundesbank's credibility and commitment to make it work through moral suasion. The arrangements of such a consortium, or of any other that could be created in other

[6] In the United Kingdom, for example, payouts on BCCI deposits began in April 1992, well after the liquidation of the bank on July 5, 1991 (see Schoenmaker, 1992).

[7] For example, under the Directive on Deposit-Guarantee Schemes (see Appendix E), foreign branches can join a host-country scheme so that they obtain "insurance coverage in a country even though that country has no authority to regulate the risk-taking behavior of those branches because of mutual recognition" (Barth, Nolle, and Rice, 1997, p. 25). In cases of supervisory oversight, these provisions are likely to generate disputes between supervisors and deposit-insurance schemes.

EMU countries, would have to be adapted to make it compatible with the transference of monetary-policy responsibilities to the ECB. Finally, and perhaps more important, an EMU-wide liquidity consortium would need to have much greater access to supervisory information than national supervisors seem willing to provide to the ECB (see Appendix F). Close cooperation between the Bundesbank and the Federal Banking Supervisory Office (discussed above) was certainly essential in identifying illiquid but solvent institutions and in convincing banks to provide emergency liquidity assistance. In sum, although liquidity consortia could be an important lender of penultimate resort in EMU, it is unlikely that, even if they were created in each EMU country, they could address a pan-European crisis without access to supervisory information and new arrangements to obtain central-bank resources in the event that their liquid assets were exhausted.

Could pools of commercial banks resolve a banking crisis in EMU without central-bank funds, and with or without the brokering role of the ECB or the NCBs? This kind of solution has several precedents, from the already mentioned pre-Federal Reserve clearinghouse experience to the more recent cases documented by Goodhart and Schoenmaker of takeovers of troubled institutions. Many of the latter required the central bank to play a brokering role, often based on its ability to gauge the systemic implications of the crisis, as well as to provide moral suasion and access to supervisory information. In the case of the near collapse and private rescue of LTCM in September 1998, the FRBNY "facilitated" the creation of a private consortium of creditors. Such solutions might be difficult to arrange within EMU for several reasons. First, the increased banking competition and the greater size of the institutions that are likely to emerge from the ongoing consolidation process at the EMU level could make it unlikely that commercial banks would have enough solidarity and resources to orchestrate bank rescues such as those observed in the past (Goodhart and Schoenmaker, 1995a). Second, increased competition could also reduce the ability of central banks to organize and coordinate such rescues. Third, in organizing brokering solutions, the NCBs would probably lose some of their power of moral suasion with the transfer of monetary-policy responsibilities to the ECB—although the Banque de France may maintain the organizing power that it has on the basis of Article 52.2 of its banking law. Fourth, the current agreement about sharing information between the ECB and the national supervisors—which can be summarized by the formula "no real obligation, no real obstacle, and some understanding"—does not give the ECB the same authority as the Bundesbank has, or

as any of the pre-EMU central banks have, with which to broker a solution to a banking crisis at the EMU level. The ECB can probably still try to play this role if it is perceived to have the same access to supervisory information at the EMU level that the Bundesbank has at the German level, or if it has independent authority to inspect counterparties in order to assess creditworthiness.

The last option is to have national treasuries play a greater role in EMU than they have so far played in the management of banking crises. One possibility would be to transfer the LOLR function to the national treasury, which would then create and fully finance an emergency fund. Given the limits set by the Maastricht Treaty on monetary financing of the public sector, any pool of liquidity set aside by treasuries to deal with banking crises could not be provided by the ESCB or the NCBs. An emergency fund would need to be created *ex ante* by raising taxes or issuing bonds—that is, before using its resources to provide liquidity assistance or to bail out a troubled institution. There are several problems with this solution. First, although the liquid resources of treasuries can be sizable (the Italian Treasury, for example, had a balance of some $30 billion in its account at the Banca d'Italia at end–1997), they will always be limited and have a sizable opportunity cost. Second, especially if the use of these funds is subject to parliamentary approval, there would be an obvious risk of delays in the management of crises, and it would certainly be more difficult to provide liquidity assistance in a discreet way and without political interference. Third, it might take too much time before national governments agree on the distribution of responsibility for bailing out an institution with EMU-wide interests.[8] Fourth, the mere existence of such a fund might create at least as much moral hazard as leaving the LOLR function with a central bank. The above considerations suggest that it is unlikely that treasuries can become the immediate providers of funds for bank rescues.

Another option would render the ESCB the immediate provider of liquidity for LOLR operations, and treasuries the ultimate providers of funds. In practice, this solution would amount to a treasury guarantee on LOLR operations of the central bank. Although such an arrangement is possible, it would need to be structured so that the independence of the central bank is maintained and so that the central bank itself (and the supervisors) is (are) not subject to moral hazard in distinguishing between solvency and illiquidity. That this incentive problem is serious is clear from the amendment of the Federal Reserve Act that was

[8] An independent EMU-wide emergency fund might overcome some of these problems.

introduced with Section 142 of the Federal Deposit Insurance Corporation Improvement Act (FDICIA) of 1991. This amendment severely limited the Federal Reserve's discretion to lend to undercapitalized institutions and specified that, if it did so lend, and that lending caused losses to the FDIC, the Federal Reserve would have to reimburse the FDIC.[9] Finally, it is likely that, if the treasury had to provide funds, it would also want to control how the ESCB would use them, with all the potentially negative implications discussed above in terms of delays and political interference. As Goodhart and Schoenmaker (1995a) put it, "he who pays the piper calls the tune."

National Central Banks as Lenders of Last Resort

The Maastricht Treaty, the ESCB Statute, and those ECB regulations and guidelines that have been made public leave considerable uncertainty about the scope that NCBs have in conducting LOLR operations. To identify this uncertainty, it is necessary to distinguish between two types of crisis: a general liquidity crisis affecting all of EMU and a local liquidity crisis with potentially systemic implications.

Consider, for example, the case of a general liquidity crisis caused by gridlock in the payments system or a sudden drop of prices across European equity markets. The ECB might temporarily relax the overall monetary-policy stance in response to the crisis and increase EMU-wide liquidity. In some cases, collateralized intraday credit and extraordinary open-market operations might be sufficient to inject the required liquidity. In other instances, these operations might not suffice because some financial institutions might have a shortage of eligible collateral. The latter situation might arise, for example, because of a sudden increase in the volume of payments in RTGS systems, such as occurred in CHAPS, which caused foreign-exchange transactions to double (Schoenmaker, 1995). The 1987 stock market crash is another example of a general liquidity crisis, in which the Federal Reserve made it clear that banks would have unrestricted access to the discount window so that they could keep their credit lines open to brokers and securities houses. If banks do not have enough eligible collateral to obtain intraday credit, gridlock can occur within TARGET and force the ESCB to accept noneligible paper as collateral for payments-system overdrafts or open-market operations.

[9] The applicability of this norm is limited, because it is difficult to identify precisely the moment when the Federal Reserve's lending allows a troubled institution not to be liquidated and increases its losses.

Whether, in the instance of a general liquidity crisis, the ECB will stick to a policy of accepting only "good" collateral at the Lombard facility and in open-market operations remains to be seen. In principle, the Governing Council of the ECB has some leeway in changing the list of eligible collateral that NCBs can accept, because the ECB Statute is vague about what collateral is eligible and indicates only that it should be "adequate" (Art. 18). In practice, in a crisis, the seventeen-member council of the ECB would have to decide rapidly, and most likely without independent access to supervisory information, whether or not to change the list of eligible collateral. The council would have to rely exclusively on the information that national supervisors (only in some cases the NCBs) would provide by way of the NCB governors on the council or, if willing, directly to the ECB board members (also on the council). This procedure could prove to be laborious during a fast-breaking pan-European liquidity problem and would require that communication channels among several authorities at the national and supranational levels work extremely well. In addition, it would require that the staff of the ECB (or of some other central agency) have the expertise and the infrastructure needed to aggregate quickly the parceled information provided by the national authorities and to assess the systemic implications of the crisis.

Coordination problems would most likely be even greater in cases of local liquidity crises that have potentially systemic implications. In these cases, an excessive degree of decentralization at the NCB level would complicate the assessment of the systemic implications of the crisis and risk transforming a local liquidity crisis into a crisis that cuts across national borders or across the entire EMU financial system.

The critical questions seem to be whether or not an NCB can provide liquidity assistance to a troubled institution without violating the ESCB Statute or guidelines, and whether the ECB needs to be informed of such operations, is required to authorize them, or can require NCBs to conduct them. The first uncertainty is whether an NCB can provide liquidity support as one of those functions not explicitly specified in the ESCB Statute (Art. 14.4) that can be "performed on the responsibility and liability of national central banks," unless prohibited by the Governing Council of the ECB.[10] The question is whether this article provides enough leeway to NCBs to provide liquidity to a bank in trouble by

[10] This article may have been adopted to provide NCBs leeway in performing functions that have limited liquidity impact, such as paying employee salaries or purchasing assets for employee pension funds. Nevertheless, there is uncertainty about its broader interpretations.

purchasing some of its noneligible assets (for example, commercial paper or loans) and letting the ESCB sterilize the "macroeconomic" liquidity effects of this operation. The specific language in the Statute suggests that the NCBs will be able to perform these operations unless the Governing Council of the ECB decides to prohibit the provision of liquidity against noneligible assets either with a qualified-majority vote—because this operation "interferes with the objectives and tasks of the ESCB" (Art. 14.4)—or with guidelines and instructions issued according to Articles 12.1 and 14.3.[11] The ECB has not yet publicly clarified this issue, but the existence of secret understandings between the ECB and the NCBs cannot be ruled out.

It is possible to invent ways for the NCBs to assist banks having liquidity problems. For example, an NCB can provide liquid assets in return for a bank's illiquid assets and assume the credit, market, and liquidity risks. Similarly, an NCB can guarantee the obligations of the troubled institution (or undertake other similar off-balance-sheet activities), as the Bank of England did in 1984 and 1991. If this were done, an open question is whether the Governing Council could argue on the basis of Article 14.4 that these NCB operations "interfere with the objectives and tasks of the ESCB" even if such operations do not affect EMU liquidity. Accordingly, the council could issue guidelines prohibiting certain types of on- and off-balance-sheet operations of the NCBs or specify that its prior authorization is required. Once more, it remains to be seen whether the council will publicly remove these ambiguities or maintain them.

Even if ECB guidelines are going to be strict enough to prevent NCBs from providing any form of direct or indirect liquidity assistance to a bank in trouble, there may be remaining leeway for NCBs through the definition of eligible Tier II collateral within the monetary-policy framework of the ESCB. The NCBs have some flexibility in redefining the list of eligible paper and can propose additions of assets to the

[11] Article 12.1 stipulates that "the Governing Council shall adopt the guidelines and take the decisions necessary to ensure the performance of the tasks entrusted to the ESCB under this Treaty and this Statute." Article 14.3 stipulates that "the national central banks are an integral part of the ESCB and shall act in accordance with the guidelines and instructions of the ECB. The Governing Council shall take the necessary steps to ensure compliance with the guidelines and instructions of the ECB, and shall require that any necessary information be given to it." Article 18.1 of the Statute does not prohibit these operations even though it requires that lending should be based on "adequate collateral," because Article 18.1 refers to the ESCB—not to the NCBs—and is in the chapter "Monetary functions and operations of the ESCB." On this ambiguity, see Schoenmaker (1995, pp. 8–9).

register of eligible Tier II collateral.[12] But because eligible collateral must be accepted by all NCBs, the Governing Council must approve these proposed additions. How quickly the approval process can work is unknown, and probably will not be known until it is used for the first time. If it becomes necessary to provide liquidity assistance, the tendency probably will be to consider problems on a case-by-case basis rather than to allow NCBs to propose, and the council to approve, the inclusion of additional assets in the list of Tier II eligible collateral on a permanent basis.

Is it prudent and practical to delegate the management of local liquidity crises entirely to NCBs? Decentralized crisis management poses risks, in part because it might not permit the proper assessment of the systemic implications of a local liquidity crisis. The more integrated the EMU financial market becomes, the greater is this risk. By contrast, centralizing decisions on LOLR operations at the ECB level—along the lines of the new U.K. framework for crisis management discussed below—would allow for the possibility of a correct assessment of the systemic implications of a crisis (given adequate ECB access to supervisory information). This benefit could more than counterbalance the risk that the ECB—in light of the higher threshold of systemic failures associated with EMU-wide money and capital markets—might refuse to assist important national institutions that single NCBs would save. With centralization of these decisions, national considerations would inevitably lose importance as financial integration proceeds. Moreover, in the short run, local governments might ask the ECB to provide emergency liquidity assistance to a troubled bank, with the understanding that they would refund to the ECB any losses it incurred. To limit the associated moral hazard and maintain it at a uniform level across EMU, it would be necessary to establish rules and procedures for obtaining such temporary liquidity assistance from the ECB. (Similar rules and procedures would be necessary in a decentralized system.) Of course, in a centralized system, LOLR decisions might not need to be taken by the ECB alone, but, as in the U.K. model discussed below, they might involve the approval of independent EMU-wide supervisory and political institutions once those were created.

Some have argued that as long as bank supervision remains decentralized, LOLR operations should also be decentralized so that national supervisors have the incentive to avoid problems in their national

[12] Tier II assets are eligible as collateral throughout EMU. Losses on Tier II collateral will be borne by the NCB that proposes it. Losses on Tier I collateral will be shared within the ESCB.

financial systems, because their country would bear the related costs (Schoenmaker, 1995). This argument is valid only so long as bank supervision remains at the national level. As is discussed below, there are reasons for greater centralization in this area as well. In addition, it is not obvious that, even with decentralized supervision, centralizing LOLR decisions requires all EMU countries to share the costs of LOLR operations. On the contrary, national authorities could be considered responsible for any costs that the system would ultimately incur if the illiquid institution turned out to be insolvent, because centralized LOLR intervention would be based on the information they provide. Indeed, the "indirect method" for distributing EMU monetary income—which is going to be used during the first five years of EMU—implies that any loss incurred by an NCB would not be shared by the others, unless the Governing Council decides otherwise on the basis of Article 33.2 of the ECB Statute (see EMI, 1997b, p. 77, regarding the indirect method).

Finally, another reason for centralizing LOLR decisions is that, in the current situation, the ESCB balance sheet is equal to the consolidated balance sheet of the eleven NCBs. It is difficult to imagine that the ECB would allow the NCBs to decide independently inherently risky LOLR operations that might adversely affect the balance sheet of the ESCB.

The ECB's Access to Supervisory Information

In all the relevant cases discussed above, the ECB appears either to be required to make a decision about injecting funds into the system in the event of a general liquidity crisis or to allow the NCBs to intervene in a local liquidity crisis. Both decisions would require access to information on the financial condition of counterparty institutions. Supervisory information would be necessary to assess the credit risk that any LOLR might incur in lending to illiquid institutions and to assess the potential systemic implications of a crisis. In most cases, the ECB would probably be unable to rely only on market assessments.

Thus, even if the ECB is only minimally involved in the management of liquidity crises—possibly only in the authorization or denial of LOLR operations of the NCBs—the current information-sharing arrangements between national supervisors and the ECB seem to be too limited to allow well-informed decisions. An arrangement in which the ECB does not have access to supervisory information on a systematic basis and in which banking supervisors "will be prepared to inform the ESCB on a case-by-case basis should a banking crisis arise" means that the ECB is dependent on national supervisory authorities for the information

required to make decisions (EMI, 1998, p. 62), in some cases about EMU-wide financial markets and pan-European institutions.[13] By contrast, much wider information-sharing arrangements exist even in countries in which banking supervision has been separated from the central bank. The German Banking Act contemplates a much broader sharing of information between the Bundesbank and the Federal Banking Supervisory Office. Other European countries also have more explicit sharing arrangements. The recent Memorandum of Understanding (MoU) between the U.K. Treasury, the Bank of England, and the U.K. Financial Services Authority (FSA), is a case in point (see FSA, 1997, appendix 2, pp. 34–39). After assigning the responsibility for banking supervision to the FSA (a noncentral bank), the MoU introduces sharing-of-information provisions. The MoU (par. 9) stipulates, for example, that "the FSA and the Bank will establish information sharing arrangements, to ensure that all information which is or may be relevant to the discharge of their respective responsibilities will be shared fully and freely. Each will seek to provide the other with relevant information as requested." The Bank of England also has "free and open access" to supervisory records (MoU, par. 21). Although these arrangements do not rule out possible conflicts among the three institutions involved in crisis management, they are more explicit than the current understanding among the ECB, the eleven NCBs, the eleven supervisory authorities, and, possibly, the eleven treasuries in EMU. In the event of a crisis involving a European banking group, these multiple understandings among EMU national authorities are bound to raise problems with regard to sharing information and coordinating roles.

It may be argued that no new arrangements will be needed to ensure adequate ECB access to supervisory information, because the governors of all the NCBs are represented in the decisionmaking body of the ECB (the Governing Council), and that MoUs, as well as an established network of contacts among supervisors, and between supervisors and the respective NCBs, have been in place for many years. There are, in addition, two multilateral forums: the Banking Supervision Committee, a senior-level committee for cooperation among national supervisors, and the Groupe de Contact, a lower-level group that addresses cases involving individual banks. By encouraging the development of pan-European markets and institutions, the intro-

[13] It remains possible, however, that a wider understanding about exchanging supervisory information might be sought if an emergency liquidity facility were set up at the EMU level (see Appendix F).

duction of the euro will create an environment in which speed will increasingly become a critical factor in the handling of systemic crises and in which bilateral agreements and channels of communication based on the large number and permutations of bilateral MoUs may prove too complicated and slow to allow for a rapid assessment of the systemic implications of a crisis.[14] As a minimum, if the ECB is to discharge its limited obligations in this area, it would seem to need access to supervisory information and to develop expertise in aggregating this information at the EMU level.

In case of disagreements among NCB governors on the appropriate course of action, an independent ECB assessment of the systemic implications of a crisis could be helpful in resolving conflicts and in avoiding risky delays. Ultimately, the ECB executive board's responsibilities in this area could evolve into a leading and coordinating role within the Governing Council of the ECB.

The historical evolution of the U.S. Federal Reserve System is an example, in this respect, of the way in which decisionmaking power and authority shifted, out of necessity, from the Federal Reserve district banks to the board of governors. It is generally believed that the conflicts in the late 1920s and early 1930s between the center (the Federal Reserve Board) and the periphery (the Federal Reserve banks, especially the FRBNY) contributed to the mismanagement of the Great Depression (Friedman and Schwartz, 1963). These conflicts led to the creation in 1935 of the Federal Open Market Committee, composed of seven members of the Federal Reserve Board and five Federal Reserve banks (rotating, but always including New York), which shifted the balance of power to the center. In the United States, Federal Reserve district banks administer discount-window lending but, before granting any advances to groups of banks, they must have the consent of not fewer than five members of the board (Federal Reserve Act, Section 10A, and Regulation A, Sections 201.4 and 201.5: "Extension of Credit by Federal Reserve Banks"). In addition, either the chairman of the board or the head of the appropriate federal banking agency must certify the viability of a borrowing institution, which is a precondition for obtaining advances for a period longer than five days (Regulation A, Section 201.4).

By contrast, in EMU, the balance of power appears to be at the periphery, not only because national supervisors assess the viability of

[14] Lorenzo Bini Smaghi (1999, p. 3–9) lists several reasons why decentralized bank regulation and supervision in EMU is "not only inefficient but also potentially dangerous for financial stability."

each institution and NCBs may grant emergency liquidity assistance, but also because the eleven NCB governors outnumber the six members of the executive board in the Governing Council of the ECB. Against this background, if decentralized crisis management in EMU proves to be ineffective, serious consideration might be given to using Article 12.1 of the ECB Statute, which foresees that "the Executive Board may have certain powers delegated to it where the Governing Council so decides."

Does Uncertainty About EMU Crisis-Management Mechanisms Constitute "Constructive Ambiguity"?

The existing uncertainty about the way in which a crisis having systemic consequences or involving a pan-European institution will be managed in EMU raises a natural question: is this ambiguity intentional and constructive? And, if so, is there any rationale for maintaining it? In practice, central banks have often kept their involvement in financial safety-net operations secret, arguing that such constructive ambiguity can reduce moral hazard and that, to avoid a panic and maintain confidence in the banking system, LOLR intervention has to be "discreet." In recent years, however, there has been a tendency toward greater disclosure and transparency, reflecting growing concerns that ambiguity reduces the accountability of supervisors and encourages regulatory forbearance and that it may not, therefore, be constructive (see, for example, Kane, 1998). In many ways, the current debate parallels the debate on rules versus discretion in monetary policy.[15]

The focus, in theory and in practice, has been on rule-based exit policies that guarantee prompt and orderly closures of insolvent institutions and ensure that part of the costs of a bank failure are borne by managers, owners and shareholders, and, perhaps, creditors (Aghion, Bolton, and Fries, 1998; IMF, 1998, chap. 5). The provisions for prompt corrective action, introduced by the 1991 FDICIA in the United States, and recently implemented in Japan, are an example of a rule that requires supervisors to take prompt action when an institution's capital ratio falls below a specified level. A more radical example is the market-based regulation in New Zealand in 1996, by which banks are required to disclose to the public information that in other countries is normally viewed as the proprietary information of the authorities. The objective of the reforms is to limit regulatory forbearance by passing

[15] See Quinn (1996) and Cordella and Levy Yeyati (1997) on the risks of excessive information disclosure.

some of the responsibility for supervising the banking system to the markets and to reduce moral hazard by changing the incentives of bank managers. Together with full disclosure, these reforms increase the frequency of external audits and credit ratings, eliminate official deposit insurance, and make the managers of financial institutions personally liable and accountable.

In the United Kingdom, the clear attribution of responsibilities and the high degree of accountability signed into the recent MoU between the Treasury, the Bank of England, and the FSA, is another example of rules. The explicit attribution of LOLR responsibilities to the Bank of England may actually have made the FSA more willing to share supervisory information. The arrangement still maintains some ambiguity about the means that will be employed in dealing with an emergency situation: "The form of the response would depend on the nature of the event and would be determined at the time" (MoU, par. 12) and on whether support will be granted: "The Bank and the FSA would need to work together very closely and they would immediately inform the Treasury, in order to give the Chancellor of the Exchequer the option of refusing support action" (MoU, par. 13). The U.K. example shows that a clear attribution of LOLR responsibilities is not an obstacle to maintaining some constructive ambiguity about how and whether emergency liquidity assistance will be granted.

In EMU, by contrast, the limited agreement on information sharing reflects the fact that no clear LOLR function has been attributed to the ECB. Current understandings seem to imply that crises can be managed in a decentralized fashion and through case-specific, ad hoc arrangements by which to assess and avert systemic problems. The idea may be that in the event of a crisis, an NCB or a national authority will provide liquidity support, and then central banks and supervisors will quietly pursue longer-lasting solutions, including the organizing of mergers, acquisitions, alliances, and other desirable market-based solutions. This lack of transparency may be interpreted as constructive ambiguity aimed at reducing moral hazard. However, from the perspective of more transparent arrangements and practices in other countries with large banking systems and deep and liquid securities markets, current understandings and arrangements within EMU can usefully develop further so as to ensure the speed of decisions and actions that is increasingly becoming a critical factor in the handling of systemic crises. In other words, although constructive ambiguity about the conditions under which LOLR facilities will be available is probably a necessary element in preventing moral hazard, prudence requires that

there should be no ambiguity among policymakers about the mechanisms that can be used to manage crises having systemic consequences or involving pan-European institutions (an observation first made in IMF, 1997, p. 55).

The current approach to crisis management in EMU seems to rely heavily on information sharing and coordinated responses, and this could delay the prompt resolution of banking problems and other financial difficulties that might occur across the pan-European financial markets and financial institutions.

The lack of transparency could also limit the realization of the considerable potential benefits of reductions in moral hazard that might accompany a well-designed strategy of constructive ambiguity. A rigorous application of the Maastricht Treaty that excludes the use of central-bank funds in the management of banking crises—at the ECB or NCB levels—would represent a significant departure from current practices in many countries. Such a change in regime might be more credible if it were more transparent, and it might then bring about the desirable reduction in moral hazard, if this is the overriding objective.[16] If it is not, European banks might expect to be bailed out and might take excessive risks. That is, one way to commit to keeping the ESCB outside the EMU safety net is to publicize a credible mechanism for crisis management. Otherwise, the policy of granting only monetary functions to the ECB will turn out to be time-inconsistent.

[16] The IMF (1998, p. 27) warns, in the context of financial safety nets, that any "abrupt changes in public policies may have adverse effects. Such changes would need to be accompanied by transparent public explanations of the new policy."

6 CONCLUDING REMARKS

Crisis management is an important issue in its own right, but it is particularly important when embarking on the challenges faced by European policymakers in EMU, especially in these early years of the union, when it is trying to establish international credibility. The decentralized approach to broader financial-policy functions, and to crisis management in particular, presents national authorities (NCBs, supervisors, treasuries) with the remaining challenges of allocating responsibility for managing a crisis involving pan-European banks. As pan-European banking groups emerge, supervisors with national orientations are less likely to be able to assess bank soundness and risks of systemic contagion adequately. As relatively recent experience has demonstrated, the sharing of responsibilities between home and host supervisors has not been uniformly successful among the Group of Ten (G–10) countries (witness BCCI, Barings, Daiwa, and others). Further, the decentralization of LOLR responsibilities could create an uneven playing field and introduce different levels of moral hazard across the countries within EMU. In addition, because the ECB does not have a statutory mandate to supervise banks and has no explicit legal authority to obtain supervisory information independently (even though it has understandings with national authorities), the new central bank may find itself at the center of European financial markets with limited information and tools for independently assessing creditworthiness of counterparties and for rapidly assessing the systemic implications of a crisis. From the perspective of practices in other countries, including those in which banking supervision has been separated from the central bank, this may not be an optimal arrangement.

One possible direction in which the EMU framework could evolve—consistent with existing allocations of responsibilities and decisionmaking—is in the direction of more ambitious and novel solutions to the problem of crisis management. The narrow concept of central banking (concentrating on price stability) that seems to have inspired the Maastricht Treaty and the ESCB Statute leaves open the possibility that the ECB, and even the NCBs, could be precluded from crisis management. If the Governing Council of the ECB decides to move in this direction, it would represent a departure from current practices for most EMU central banks, including the Bundesbank.

Given that the potential for crises would not simultaneously diminish, and on the contrary might increase in the short and medium term, it would become necessary to develop other institutional mechanisms for crisis management that do not involve the central bank, such as a privately funded liquidity consortium that also has national authorities as shareholders.

This study has considered whether such non-central-bank mechanisms, including deposit-insurance schemes, German-style liquidity consortia, pools of solvent banks, and emergency liquidity funds of national treasuries, will permit the management of banking crises without using central-bank funds. Its conclusion is that, given that all non-central-bank institutions can set aside *ex ante* only a limited quantity of resources and that speed is increasingly becoming a critical factor in the handling of systemic crises, the ECSB, or the NCBs, will have to remain, at least in the case of pan-European crises, the *immediate* providers of liquidity, while other entities will become the *ultimate* providers of funds. Any arrangement of this kind would require an extraordinary coordination among the relevant authorities in each EMU country. The effective resolution of crises involving pan-European financial institutions would appear to require the involvement of the ECB and the eleven NCBs, supervisory agencies, national treasuries, and deposit-insurance schemes. Although this is technically feasible, it would require a high degree of political consensus and coordination. Although the EMU framework for crisis management might evolve in this direction, it seems unrealistic at this time for it to occur soon. The likelihood of this novel arrangement would increase, however, if a single pan-European independent financial supervisor and regulator were to emerge.

Another possible direction in which the framework might change is that the ECB might evolve into an institution that would assume a leading and coordinating role in crisis management. If no other single institution can satisfactorily take up LOLR responsibility at the EMU level, responsibility might devolve to the ESCB. It could devolve to the NCBs, but the ECB would, at a minimum, need to be able to assess the systemic implications of a crisis rapidly, especially if it involves pan-European institutions. This might require the ECB to have more independent and regular access to supervisory information than is made explicit in the relevant statutes. Although the ECB may never assume supervisory functions directly, extensive information-sharing arrangements, similar to those between the Bundesbank and the Federal Banking Supervisory Office would be desirable.

The ECB and the other relevant authorities might be tempted to maintain uncertainty about crisis-management mechanisms, on the principle that some ambiguity would be constructive and would reduce moral hazard. It may be desirable to maintain ambiguity about the conditions under which liquidity and LOLR support would be considered and granted. However, it would be unusual, and at variance with practices in other industrial countries, to fail to identify clearly *ex ante*, at least among all policymakers, the division of responsibilities between the ECB and the eleven national authorities and central banks.

First, in the event of a crisis involving a pan-European institution or of a local crisis having systemic implications, the coordination problems faced by EMU authorities are likely to be greater than those faced before in similar situations. In practice, it would be difficult and potentially costly to work out responsibilities in the midst of a crisis and on an ad hoc basis. Second, because of the greater integration of financial markets and banking systems within EMU, crises are likely to develop more rapidly and less transparently than in smaller, national markets. It is a reasonable assumption that faster response times will be required to detect and assess problems and to contain the consequences of crises than were needed during past crises in European countries, where financial markets were segmented, protected, and (until recently) insulated, and where public sectors were still large shareholders in large segments of the banking system.

The degree of public transparency about the mechanisms (although not about the conditions and circumstances in which they will be applied) for resolving systemic crises is to some extent a matter to be decided by policymakers themselves. Nevertheless, public transparency can be justified. If the intention is to control tightly the conditions under which central-bank funds are provided to institutions experiencing problems, it might be desirable to clarify and announce the change in regime so that the desired reductions in moral hazard can be achieved. It would be desirable, for example, to avoid situations in which constructive ambiguity might encourage financial institutions to expect liquidity assistance in a crisis when the ESCB has no intention of granting it. In such a situation, the risk of widespread insolvency triggered by a run on liquidity could force the ESCB to renege on its commitment not to intervene and to reveal the time-inconsistency of its stated policy.

APPENDIX A: TARGET

The TARGET settlement system is a payments system designed to process cross-border transactions denominated in euros after the start of Stage Three of EMU on January 1, 1999. TARGET has two main objectives. The first is to provide a safe payments mechanism within the euro area based on RTGS procedures that will insulate the payments system across Europe from the effects of liquidity and payment difficulties experienced by a single institution.[1] The second goal is to create an efficient system of cross-border payments that will integrate the money markets of the participating countries and support the implementation of the single monetary policy in Stage Three.

Participation

The TARGET system is composed of one RTGS system in each of the EMU countries and the payments mechanism of the ECB connected by common infrastructures and procedures forming the Interlinking System, a communications network (see Figure A-1).[2] Only the ECB

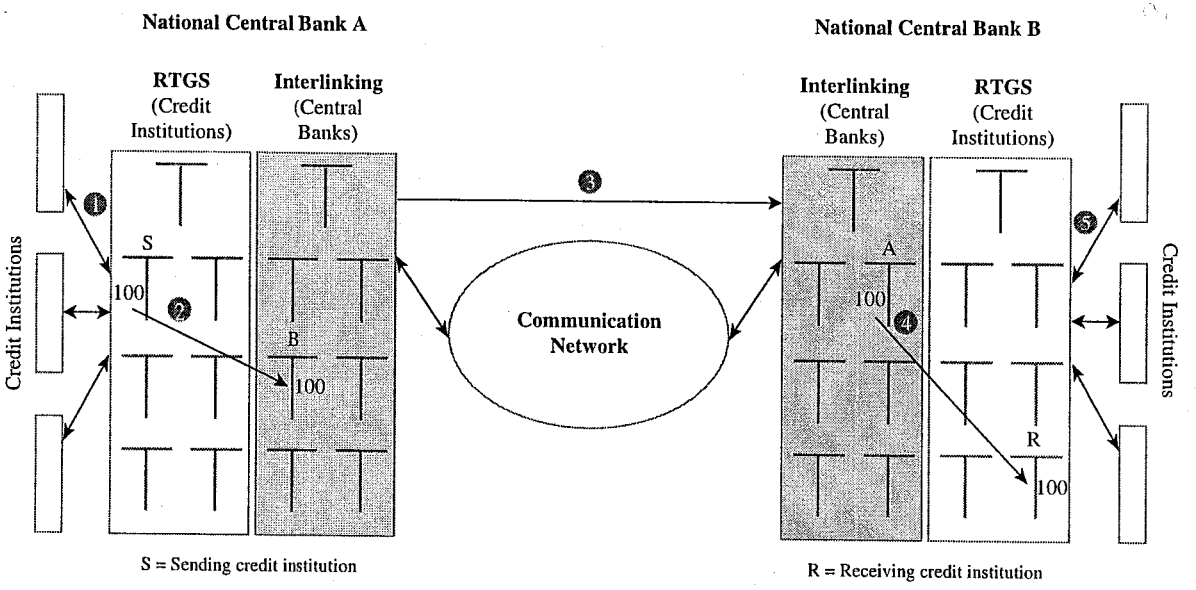
[1] In RTGS systems, payments orders are processed one by one on a sequential basis. As long as there are sufficient funds or overdraft facilities available in the sending institution's account with the central bank, there will be immediate and final settlement of all payments. The receiving institution bears no credit or liquidity risk on the payments orders received, because its account is credited only after the account of the sending institution is debited.

Until the May 19, 1998, "directive on settlement finality in payment and securities settlement systems" is implemented in all EMU countries (the deadline is December 11, 1999), some systemic risk will remain in both netting and RTGS payments systems—as well as securities settlement systems—because of the retroactive effect of insolvency procedures. The "zero-hour" rule currently applied in Austria, Italy, and the Netherlands renders all transactions void from midnight (that is, the zero hour) before the actual openings of insolvency procedures. This implies that payments and securities transactions after the zero hour and before the opening of insolvency proceedings may not be final. Under the existing legislation, in case of insolvency, even the collateral securities pledged to obtain intraday credit in an RTGS system may be affected by insolvency proceedings. The implementation of the directive will make, instead, the transfer orders of money and securities final and irrevocable once they have been accepted in the system and until payments and securities settlement systems are notified of insolvency proceedings against participants.

[2] Although the Interlinking procedures will be identical in all countries, the payments services for end users may differ, reflecting local conditions under which RTGS systems have been developed in each country (for example, some systems may include queuing facilities or cash-management facilities).

FIGURE A–1

CROSS-BORDER TARGET PAYMENTS



and NCBs will be allowed to use the Interlinking System, but any participant in any RTGS system connected to TARGET will be allowed to send payments through TARGET. Because TARGET is designed to process only euro transactions, RTGS systems of EU countries not in EMU will be allowed to connect to TARGET only if they are able to process euros. Remote access to domestic RTGS systems will be granted on a nondiscriminatory basis to credit institutions licensed in other EU states either through their local branches or directly from another EU country. To facilitate the operations of large-value net-settlement systems working in euros through TARGET, net-settlement systems will be allowed to open a special account with the ECB or an NCB that must be used exclusively for settlement purposes and must have a zero balance at the beginning and end of each day.

Structure

TARGET is designed as a decentralized system in which payments messages are exchanged on a bilateral basis among NCBs, according to the central-banking correspondent model, without any central counterparty. The "Second Progress Report on TARGET" (September 1997) eliminated the uncertainty about whether the ECB will be connected to TARGET. The ECB will have its own payments mechanism connected to TARGET, which will (1) process payments for the ECB and its customers, (2) provide settlement services to cross-border large-value net-settlement systems, and (3) maintain accounts on behalf of the ECB's institutional customers.

The ECB will neither monitor nor receive information on inter-NCB payments orders during the day. At the end of the day, the ECB will perform specific control operations with the aim of checking the correctness of cross-border payments exchanged during the day and the resulting inter-NCB balance positions. The clearing and settlement modalities (frequency of settlement, degree of centralization, means of payment) of outstanding balances among NCBs have not yet been announced.

In the U.S. Federal Reserve System, the board of governors, like the ECB, does not monitor the settlement positions of each Federal Reserve bank during the day. At the end of each business day, the reserve bank's Integrated Accounting System settles the cross-district financial transactions by debiting or crediting as appropriate each reserve bank's Interdistrict Settlement Account. This daily clearing process is known as the "gold wire process." The board coordinates once a year (in April) the settlement of the balances on the Interdistrict

Settlement Accounts by means of a transfer of Gold Certificate assets among reserve banks. The amount settled is equal to the daily average balance in the Interdistrict Settlement Account over the previous year. No such clearing process has been announced in the ESCB, and this omission opens up the possibility that one NCB might accumulate large claims against another NCB, with no mechanism available for their settlement (Bishop, 1997; Dooley, 1997; Garber, 1997; Kenen, 1997).

Transactions Processed

In accordance with the objective of facilitating the implementation of a single monetary policy, credit institutions will be required to use TARGET for payments directly connected with monetary-policy operations. Furthermore, large-value net-settlement systems are likely to use TARGET to perform their settlement operations because they are bound to settle in central-bank money and therefore in euros.[3] Credit institutions will decide whether to use TARGET for other categories of payments, and there will be no upper or lower limits to the amounts transferred, besides those in the domestic RTGS systems. Nevertheless, the EMI indicated that TARGET is expected to process mainly large-value payments between credit institutions, whereas private systems are expected to process small-value payments (EMI, 1996, p. 7).

Intraday Liquidity

Participants in RTGS systems may experience a liquidity shortfall whenever they need to send a payments order before receiving one. In this situation, payments may be blocked or queued until sufficient funds become available either through incoming payments or by borrowing in the market; in the limit, settlement may be delayed and gridlock may occur with systemic implications (that is, payments cannot be processed because of a lack of sufficient funds). To avoid such events, the NCBs in EMU will allow intraday mobilization of reserve requirements and will provide participants in their RTGS systems with fully collateralized intraday credit in the form of daily overdrafts or repurchase agreements.

On July 8, 1998, the ECB announced the conditions under which London-based institutions and other non-euro credit institutions are permitted to access TARGET. The conditions are imposed to assure that "non-euro credit institutions will always be in a position to reimburse intraday credit in due time, thus avoiding any need for overnight

[3] This is stated in Principle 5 of the report on "Minimum Common Features for Domestic Payments Systems" released by the Committee of Governors in November 1993 (IMF, 1997, p. 172).

central bank credit in euro. . . . Safeguards will be based on the intraday credit being capped, on an early liquidity deadline and on a system of penalties in the event of a failure to reimburse the intraday credit" (ECB, 1998b, pp. 1–2). The conditions are as follows: (1) credit institutions may receive collateralized intraday credit from their non-EMU NCBs on the basis of a euro deposit with the ESCB (set at 3 billion euros for the United Kingdom and at 1 billion euros for each of the three other non-EMU NCBs); (2) there will be a 1 billion euro ceiling on each RTGS participant's use of intraday credit from its own non-EMU NCB; (3) after 5 P.M., credit institutions may make payments only out of positive balances; (4) a penalty rate of 5 percentage points over the marginal lending rate is imposed for spillovers; (5) balances with the non-EMU NCB will be remunerated at rates to be set between 0 percent and the rate of the ESCB's deposit facility; and (6) non-EMU NCBs are allowed to take domestic collateral of the same quality as the ESCB eligible assets, and EMU NCBs may accept the collateral issued in non-EMU countries with the risk to be borne by non-EMU NCBs.

Institutions making cross-border payments to the euro area may adapt their behavior in a number of ways. In some instances, they will still channel payments through the TARGET system; in others they will not. First, non-EMU NCBs may borrow euros in the market to provide intraday credit—up to the 3 or 1 billion euro ceilings—to participants in domestic RTGS systems for cross-border payments to the euro area; in this instance, systemic risks might be reduced as much as they would be reduced given direct access to ECB's intraday credit. Second, non-EMU banks may obtain intraday credit in euros through branches and subsidiaries in the euro area that have unrestricted access to intraday and overnight credit; in this case also, the potential risk reductions associated with TARGET will be fully captured. Third, non-EMU institutions may decide to make cross-border payments to the euro area through private net-settlement systems, thus reducing the number of transactions across TARGET; in this instance, some of the systemic-risk reductions that might be achieved through TARGET will not be realized.

Operating Hours and Pricing Policies

The operating hours of TARGET will be from 7:00 A.M. to 6:00 P.M.; domestic RTGS systems will be allowed to open earlier to process domestic payments. One hour before closing time, participants in RTGS systems will stop processing customers' payments in euros, and

only interbank payments will be allowed. These hours will allow for a longer overlap between TARGET and the payments systems in North America and the Far East in an effort to reduce cross-currency settlement risk.

TARGET pricing policy will be directed at cost recovery but also at (1) maintaining a level playing field between participants, (2) contributing to risk-reduction policies by preventing institutions from using a less-secure payments mechanism, and (3) avoiding transaction charges, which would discourage interest-rate arbitrage and hinder the integration of the money market.

APPENDIX B: MONETARY-POLICY INSTRUMENTS AND PROCEDURES

Decentralization is the key principle underlying the operational framework for monetary policy in Stage III. According to the EMI (1997a, p. 18), "the ECB should have recourse to the NCBs to carry out operations to the extent deemed possible and appropriate" in accordance with Article 12 of the ESCB Statute. The agreed goal is "to rely as much as possible on the existing infrastructure and on the NCBs' experience, provided that the application of this principle does not conflict with other guiding principles" (EMI, 1997a, p. 18). The latter include operational efficiency; conformity to market principles; equal treatment to all financial institutions accessing the ESCB's facilities; simplicity, transparency, and cost efficiency; conformity with the decisionmaking process of the ESCB (which requires the Governing Council of the ECB to be able to control the overall stance of monetary policy at all times); and harmonization of the instruments across countries to the extent necessary "to ensure a single monetary policy stance across the euro area, as well as the equal treatment of counterparties and the avoidance of regulatory arbitrage" (EMI, 1997a, p. 18).

Monetary-Policy Instruments and Procedures

Open-market operations are the main monetary-policy instrument of the ESCB. In addition, there are standing facilities and, in particular, a marginal-lending and a marginal-deposit facility, as well as fully remunerated minimum-reserve requirements.

Open-market operations are expected to take mainly the form of reverse transactions (repos), but four other instruments are envisaged: outright transactions, issuance of debt certificates, foreign-exchange swaps, and collection of fixed-term deposits. To conduct open-market operations, the ECB can choose between three procedures: standard tenders, quick tenders, and bilateral procedures. These operations are executed by the NCBs, which—in the case of tenders—collect all the bids and transmit them to the ECB; the latter then sums them up and selects the winning bids. Most refinancing to the financial sector is provided through regular weekly reverse transactions (repos) with a maturity of two weeks (see Table B–1).

TABLE B–1

EUROPEAN SYSTEM OF CENTRAL BANKS: OPEN-MARKET OPERATIONS AND STANDING FACILITIES

Monetary-Policy Operations	Types of Transactions: Provision of Liquidity	Types of Transactions: Absorption of Liquidity	Maturity	Frequency	Procedure
		Open-Market Operations			
Main refinancing operations	Reverse transactions (repos)	n.a.	Two weeks	Weekly	Standard tenders
Longer-term refinancing operations	Reverse transactions (repos)	n.a.	Three months	Monthly	Standard tenders
Fine-tuning operations	Reverse transactions (repos)	Reverse transactions (repos)	Nonstandardized	Nonregular	Quick tenders
	Foreign-exchange swaps	Foreign-exchange swaps			
		Collection of fixed-term deposits			Bilateral procedures
	Outright purchases	Outright sales	n.a.	Nonregular	Bilateral procedures
Structural operations	Reverse transactions (repos)	Issuance of debt certificates	Standardized and nonstandardized	Regular and nonregular	Standard tenders
	Outright purchases	Outright sales	n.a.	Nonregular	Bilateral procedures
		Standing Facilities			
Marginal-lending facility	Reverse transactions (repos)	n.a.	Overnight	Access at the discretion of counterparties	Access at the discretion of counterparties
Deposit facility	n.a.	Deposits	Overnight	Access at the discretion of counterparties	Access at the discretion of counterparties

SOURCE: European Monetary Institute (1997a).

To steer interest rates in the event of unexpected liquidity fluctuations, the ESCB can use fine-tuning operations. These would be executed primarily as reverse transactions, but they might also take the form of outright transactions, foreign-exchange swaps, or collection of fixed-term deposits. Fine-tuning operations would normally be executed by the NCBs through quick tenders or bilateral procedures, but under exceptional circumstances, they might be executed in a centralized manner by the ECB.

Longer-term refinancing operations with a monthly frequency and a maturity of three months are also foreseen, but they would not send signals to the market. Finally, reverse or outright transactions and debt certificates allow the ECB to affect the structural-liquidity position of the system.

Two standing facilities (a marginal-lending and a marginal-deposit facility) allow counterparties to obtain overnight liquidity or make overnight deposits with NCBs in EMU. The interest rates on these facilities should determine the ceiling and the floor of a corridor within which overnight rates are expected to fluctuate. Under normal circumstances, the access to these facilities will not be restricted, so that any eligible counterparty will be able to obtain an unlimited credit from the lending facility as long as it has enough eligible collateral. The ESCB may, however, limit or suspend individual counterparties' access to the facility in exceptional circumstances.

The ECB decided to introduce minimum average reserve requirements with a reserve ratio of 2 percent of the liability base. Reserves earn interest at the prevailing securities repurchase rate. The EMI had earlier indicated three possible rationales for the introduction of minimum average reserve requirements. First, average requirements would help to stabilize short-term interest rates. Second, reserve requirements could be used to create or enlarge a structural-liquidity shortage in the money market. Third, reserve requirements could help to stabilize monetary aggregates. By stabilizing short-term rates, average reserve requirements would reduce the amount and frequency of fine-tuning operations, which in a decentralized operational framework could become cumbersome.

Eligible counterparties of the ESCB for monetary-policy operations are either institutions that are established in the euro area and are subject to at least one form of EU supervision, or branches of non-EMU institutions that have their head office in an EU or EEA country. These institutions must be financially sound, and the ESCB has the authority to suspend temporarily or permanently their access to monetary-policy instruments on prudential grounds. Branches of institutions

from third countries may be counterparties only in bilateral outright operations involving purchases or sales of securities.

All ESCB liquidity-providing operations are based on adequate collateral as required by Article 18.1 of the ESCB Statute. Both public and private assets denominated in euros are eligible as collateral. Tier I collateral includes assets that fulfill eligibility criteria specified by the ECB for the whole euro area; Tier II collateral includes other assets that EMU NCBs may consider eligible in accordance with ECB guidelines (Table B–2). Both Tier I and Tier II assets are eligible in the whole euro area, but, whereas the default risk related to Tier I paper is borne by the ESCB as a whole, default risk related to Tier II paper is borne by the EMU NCB that proposed it.[1] To control risk and to avoid the "cheapest to deliver" problem (counterparts delivering the lowest-quality collateral), the ECB imposes margins and "valuation haircuts" on Tier I and Tier II assets. A list of Tier II assets was deemed necessary because several NCBs have traditionally accepted sizable amounts of nonmarketable private bills and loans as collateral; to assess the related counterparty risk, some NCBs employ a considerable number of people (500 in France, 300 in Germany, and 100 in Austria).

The ESCB has the capacity to conduct foreign-exchange intervention from the start of Stage III by means of reserves transferred from the EMU NCBs to the ECB, totaling a maximum amount of 50 billion euros (Article 30 of the ESCB Statute). The management of foreign reserves that remain with the EMU NCBs is subject to guidelines issued by the ECB (Article 31.3) to assure that such operations do not interfere with the monetary and exchange-rate policies of the ECB. Exchange-rate-policy cooperation between the euro area and other EU countries is envisaged within the framework of a new exchange-rate mechanism called "ERM 2." The ECB makes decisions related to foreign-exchange intervention, but both the ECB and the EMU NCBs may implement them, because the infrastructure for the conduct of foreign-exchange intervention that was developed by the ESCB allows for different degrees of centralization. Counterparties for foreign-exchange intervention need to satisfy a number of prudential and efficiency criteria.

[1] Cross-border use of collateral, that is, the possibility for a counterparty located in one country of the euro area to receive credit from its NCB, using assets located in another country of the euro area, is envisaged. Given the incomplete coverage of international linkages between central securities depositories for this purpose, a mechanism based on the "correspondent central banking model" has been developed by NCBs to ensure that all eligible assets may be used on a cross-border basis.

TABLE B–2

EUROPEAN SYSTEM OF CENTRAL BANKS: ELIGIBLE ASSETS

Criteria	Tier I	Tier II
Type of asset	ESCB debt certificates; other marketable debt instruments (excluding "hybrid" instruments)	Marketable debt instruments; nonmarketable debt instruments; equities traded on a regulated market
Settlement procedures	Assets must be centrally deposited in book-entry form with an NCB or a central securities deposit fulfilling ECB minimum standards	Assets must be easily accessible to the NCB that has included them in its Tier II list
Type of issuer	ESCB; public sector; private sector; international and supranational institutions	Public sector; private sector
Financial soundness	The issuer (guarantor) must be deemed financially sound by the ECB	The issuer/debtor (guarantor) must be deemed financially sound by the NCB that has included the asset in its Tier II list
Location of issuer	EEA	Euro area
Location of asset	Euro area	Euro area
Currency of denomination	Euro	Euro
Memorandum item: Cross-border use	Yes	Yes

SOURCE: European Central Bank (1998b, p. 43, table 4).

Monetary-Policy Operating Procedures in Other Industrial Countries

Monetary-policy operating procedures in industrial countries seem to be guided by two alternative paradigms; see Table B–3 (Borio, 1997). On the one hand, the central banks of Australia, Canada, Japan, the United Kingdom, and the United States play an active role in their domestic money markets by intervening daily. This reflects a relatively volatile demand for liquidity, possibly attributable to their more developed securities markets. On the other hand, most continental European central banks intervene infrequently, relying mainly on average reserve requirements to smooth liquidity shocks.[2]

Like the ECB, most central banks use reverse transactions, in the form of repos or reverse repos, as their main monetary-policy instrument. Only in Canada are reverse transactions not the main instrument used; there, the Canadian central bank transfers government deposits between its balance sheet and those of clearing banks. In the United Kingdom, the Bank of England has, since 1994, increasingly used repos alongside the traditional outright purchases of commercial bills; this trend is likely to continue with the opening of the private repo market in January 1996.

The two-week maturity and the weekly frequency selected for the ECB's operations are identical to those of the reverse transactions in Germany. In most other countries, the maturity of reverse transactions is shorter. There is a clear-cut distinction between the higher frequencies of intervention in Australia, Canada, Japan, the United States, and the United Kingdom (up to three times a day) and the lower (generally weekly) frequencies in all other countries. Additional irregular fine-tuning operations are used in almost every country with the exception of Austria and Germany. Also fairly common are long-term refinancing operations, although these are not used in Australia, Canada, Spain, and Sweden.

Most countries also have marginal lending and deposit facilities. Where a formal standing facility does not exist, similar arrangements are in place. In the United Kingdom, there are several facilities charging escalating rates aimed at limiting the rise in the overnight rate. In Canada, discretionary reverse transactions operate as quasi standing facilities. In Germany, issuance of short-term paper plays the role of a deposit facility. Although some countries still maintain a subsidized below-market facility (discount window), it has generally not been used in recent years for liquidity-management purposes.

[2] In the United States, the growing use of so-called "sweep accounts" is increasingly reducing the buffer role of reserve requirements.

TABLE B–3

KEY MONETARY-POLICY OPERATING PROCEDURES IN INDUSTRIAL COUNTRIES AND IN THE EUROPEAN CENTRAL BANK

	ECB	AUS	BEL	FRA	GER	ITA	NET	SPA	SWE	UK	AUS'L	CAN	JAP	SWI	US
Main operation	RT	RP	RP	RP	RP	RT	CL	RP	RT	OT	RT	RT	RT	FX	RT
Maturity	14	7	7-15	7	14	≤30	2-8	10	7	1-33	7 (av)	1	1-90	80-120	1-15
Frequency	1/wk	1/wk	1/wk	2/wk	1/wk	≥1/wk	1/4d	1/10d	1/wk	≤3/d	1/d	1/d	≤3/d	=1/wk	=1/d
Fine-tuning operations	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Long-term financing operations	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	No	No	Yes	Yes	Yes
Standing facility															
Lending	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	*[b]	Yes	Yes[c]	No	Yes	No
Deposit	Yes	Yes	Yes	No	No[d]	No	No	No	Yes	No	Yes	*[c]	No	No	No
Below market	No	Yes	Yes	No	Yes	Yes	Yes	No	No	No	No	No	Yes[e]	No	Yes
Reserve requirements	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	*[f]	Yes	Yes[g]	Yes	Yes	Yes
Remuneration	Yes	No	No	No	No	Yes	Yes	No	No	No	Yes	No	No	Yes	No

SOURCE: Borio (1997).

NOTE: RT = reverse transaction (repo or reverse repo); RP = repo (reverse purchase); OT = outright transaction, secondary market; CL = collateralized loan; FXS = foreign-exchange swap (purchase or sale).

[a] Or collateralized loans, depending on assets backing the transaction.

[b] A number of facilities aimed at limiting the rise in the overnight rate.

[c] Mainly overdraft loans. In addition, discretionary reverse transactions operated on occasions as a quasi standing facility.

[d] Discretionary issuance of short-term paper operated on occasions as a standing facility

[e] Inactive since July 1995.

[f] Cash-to-deposits ratio.

[g] Requirement that average settlement balances before overdrafts be non-negative.

Average reserve requirements exist in Australia, Austria, Canada, France, Germany, Italy, Japan, the Netherlands, Spain, Switzerland, and the United States, but they are remunerated only in Australia, Italy, the Netherlands, and Switzerland. To reduce the volatility of the overnight rates, some countries without reserve requirements have introduced averaging provisions. In Canada, for example, there is a zero reserve requirement with averaging, and banks are penalized when they have negative average settlement balances on a one-month period. In the United Kingdom, reserve requirements have been replaced by a small cash-to-deposits ratio, but without averaging.

Although frequent interventions have not been ruled out, the announced framework for the ECB's monetary policy appears much closer to the continental European model than to that of one of the other industrial countries. Events, however, could force the ECB to play a more active role.

APPENDIX C: THE LOCATION OF THE BANKING-SUPERVISION FUNCTION

Among the industrial countries, there is no clear tendency to combine banking-supervision functions with monetary-policy functions (Table C–1). About half of the countries combine the two functions within the central bank. The other countries separate these functions and assign supervisory responsibilities to another agency, usually under the control of the ministry of finance. In some instances, the distinction is blurred. In France, for example, the banking commission (Commission Bancaire) is chaired by the governor of the Banque de France and includes representatives of the French Treasury. The commission supervises compliance with regulations, but the Banque de France carries out inspections on behalf of the commission (these cases were classified following Goodhart and Schoenmaker, 1995a). In an increasing number of countries, however, banking supervision has been assigned to a separate institution. Among the twelve countries represented in the Basle Committee on Banking Supervision, only two (Italy and the Netherlands) have the central bank as the only bank supervisor.

There does not seem to be any clear-cut correspondence between monetary operating procedures and banking-supervision models. Industrial countries outside continental Europe do not share the same model. Some countries (New Zealand and, to some extent, the United States) combine monetary and supervisory functions within the central bank, whereas other countries (Australia, Canada, the United Kingdom,[1] and, to some extent, the United States) separate them. Continental European countries are also split as to how to allocate these responsibilities. Germany, some of its close neighbors (Austria, Belgium, Denmark, Switzerland), and the Scandinavian countries (Finland, Norway, Sweden) separate the two functions, whereas the other EU countries combine them.

Current plans suggest that EMU is likely to follow the German model of separating monetary and supervisory responsibilities. The Maastricht

[1] Until May 1997, the United Kingdom was following the alternative model of banking supervision. In May, the government announced plans to move responsibility for banking supervision from the Bank of England to the Securities and Investments Board, to be renamed the "Financial Services Authority" (FSA). The FSA came into existence on October 28, 1997, and took over banking-supervision responsibilities from the Bank of England on June 1, 1998.

TABLE C–1

MONETARY AND SUPERVISORY AGENCIES

Country	Monetary Agency	Supervisory Agency
Australia	Reserve Bank of Australia (CB)	Australian Prudential Regulatory Authority
Austria	National Bank of Austria (CB)	(Federal) Ministry of Finance (MF)
Belgium	National Bank of Belgium (CB)	Bank and Finance Commission
Canada	Bank of Canada (CB)	Office of the Superintendent of Financial Institutions (MF)
Denmark	Danmarks Nationalbank (CB)	Financial Supervisory Agency (MEA)
Finland	Bank of Finland (CB)	Financial Supervision Authority (CB), Bank of Finland (CB)
France	Banque de France (CB)	Banque de France (CB), Commission Bancaire
Germany	Deutsche Bundesbank (CB)	Federal Banking Supervisory Office, Deutsche Bundesbank (CB)
Greece	Bank of Greece (CB)	Bank of Greece (CB)
Hong Kong, China	Hong Kong Monetary Authority (CB)	Hong Kong Monetary Authority (CB)
Ireland	Central Bank of Ireland (CB)	Central Bank of Ireland (CB)
Italy	Banca d'Italia (CB)	Banca d'Italia (CB)
Japan	Bank of Japan (CB)	Financial Supervisory Agency
Luxembourg	Luxembourg Monetary Institute (CB)	Commission de Surveillance du Secteur Financier
Netherlands	De Nederlandsche Bank (CB)	De Nederlandsche Bank (CB)
New Zealand	Reserve Bank of New Zealand (CB)	Reserve Bank of New Zealand (CB)
Norway	Norges Bank (CB)	Banking, Insurance, and Securities Commission (MF)
Portugal	Banco de Portugal (CB)	Banco de Portugal (CB)
Spain	Banco de España (CB)	Banco de España (CB)
Sweden	Sveriges Riksbank (CB)	Swedish Financial Supervisory Authority
Switzerland	Swiss National Bank (CB)	Federal Banking Commission
United Kingdom	Bank of England (CB)	Financial Services Authority
United States	Federal Reserve Board (CB)	Office of the Comptroller of the Currency (MF); Federal Reserve Board (CB); state governments; FDIC
Venezuela	Banco Central de Venezuela (CB)	Superintendency of Banks

SOURCE: Update of Goodhart and Schoenmaker (1995).

NOTE: The sample covers the OECD countries as well as China, Hong Kong, and Venezuela. CB = Central Bank, MEA = Ministry of Economic Affairs, MF = Ministry of Finance.

Treaty (see Appendix F) limits the role of the ECB in the area of prudential supervision to "specific tasks" that the EU Council may grant it following a proposal of the European Commission. The Treaty makes clear that the role of the ESCB is subordinate to that of the competent supervisory authorities by indicating that the ESCB is expected "to 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" (Article 105[5]). Accordingly, the ESCB Statute (Article 25[1]) assigns the ECB only an advisory function by indicating that "the ECB may offer advice to and be consulted by the Council, the Commission, and the competent authorities of the EU countries on the scope and implementation of Community legislation relating to the prudential supervision of credit institutions and to the stability of the financial system."

APPENDIX D: FINANCIAL REGULATION, CAPITAL STANDARDS, AND SUPERVISORY PRACTICES

There are considerable differences in the regulation of banks' activities and their ownership structure across EU countries. Table D–1 classifies EU and G–10 countries according to the extent to which they are allowed to engage in securities, insurance, and real-estate activities, and to own or be owned by nonbanks (Barth, Nolle, and Rice, 1997). Unless further harmonization takes place, banking regulations grant considerably different powers to banks in each country. These range from the "very wide powers" given banks in Austria, France, Holland, and the United Kingdom, to the "wide powers" given banks in Denmark, Finland, Germany, Ireland, Luxembourg, Portugal, and Spain, to the "somewhat restricted powers" given banks in Belgium, Greece, Italy, and Sweden.

Of all these possible banking activities, securities operations are the most uniformly regulated across the EU. They are "unrestricted" in all EU countries except Belgium, where a bank may not underwrite stock issues, and Greece, where dealing and brokerage must be conducted through subsidiaries.[1] Firewalls (that is, restrictions designed to keep securities and insurance operations separate from affiliated banks) are mandated only in Denmark, Greece, and Italy. Insurance activities by banks are also "permitted" in most countries if they are conducted through subsidiaries, but they are "restricted" in Finland, Germany, and Greece (that is, less than a full range of activities may be conducted in the bank or subsidiaries), and they are "prohibited" in Ireland. Real-estate activities are "restricted" in more than one-third of the EU countries, "permitted" in Denmark, Germany, Finland, France, and the Netherlands, and "unrestricted" only in the Austria, Ireland, Luxembourg, and the United Kingdom. Commercial-bank investment in nonfinancial firms is "unrestricted" in two-thirds of the EU countries, "permitted" in Portugal, and "restricted" in Belgium, Denmark, Italy,

[1] "Unrestricted"" means that a full range of activities in the given category may be conducted directly in the bank. "Permitted" means that a full range of activities may be conducted, but all or some must be conducted in subsidiaries. "Restricted" means that less than a full range of activities may be conducted in the bank or subsidiaries. "Prohibited" means that the activity may not be conducted in either the bank or subsidiaries. See Barth, Nolle, and Rice (1997).

TABLE D–1

PERMISSIBLE BANKING ACTIVITIES AND BANK OWNERSHIP IN THE EUROPEAN UNION AND G–10 COUNTRIES, 1995

	Securities[a]	Insurance[b]	Real Estate[c]	Commercial-Bank Investment in Nonfinancial Firms	Nonfinancial-Firm Investment in Commercial Banks
Very wide powers					
Austria	Unrestricted	Permitted	Unrestricted	Unrestricted	Unrestricted
France	Unrestricted	Permitted	Permitted	Unrestricted	Unrestricted
Netherlands	Unrestricted	Permitted	Permitted	Unrestricted	Unrestricted
Switzerland	Unrestricted	Permitted	Unrestricted	Unrestricted	Unrestricted
United Kingdom	Unrestricted	Permitted	Unrestricted	Unrestricted	Unrestricted
Wide powers					
Denmark	Unrestricted	Permitted	Permitted	Restricted	Unrestricted
Finland	Unrestricted	Restricted	Permitted	Unrestricted	Unrestricted
Germany	Unrestricted	Restricted	Permitted	Unrestricted	Unrestricted
Ireland	Unrestricted	Prohibited	Unrestricted	Unrestricted	Unrestricted
Luxembourg	Unrestricted	Permitted	Unrestricted	Unrestricted	Restricted
Portugal	Unrestricted	Permitted	Restricted	Permitted	Unrestricted
Spain	Unrestricted	Permitted	Restricted	Unrestricted	Permitted
Somewhat restricted powers					
Belgium	Permitted	Permitted	Restricted	Restricted	Unrestricted
Canada	Permitted	Permitted	Permitted	Restricted	Restricted
Greece	Permitted	Restricted	Restricted	Unrestricted	Unrestricted
Italy	Unrestricted	Permitted	Restricted	Restricted	Restricted
Sweden	Unrestricted	Permitted	Restricted	Restricted	Restricted
Restricted powers					
Japan	Restricted	Prohibited	Restricted	Restricted	Restricted
United States	Restricted	Restricted	Restricted	Restricted	Restricted

SOURCE: Barth, Nolle, and Rice (1997).

NOTE: "Unrestricted" means that a full range of activities in the given category may be conducted directly in the bank. "Permitted" means that a full range of activities may be conducted, but all or some must be conducted in subsidiaries. "Restricted" means that less than a full range of activities may be conducted in the bank or subsidiaries. "Prohibited" means that the activity may not be conducted in either the bank or subsidiaries.

[a] Securities activities include underwriting, dealing, and brokering all kinds of securities and all aspects of the mutual-fund business.

[b] Insurance activities include underwriting and selling insurance products and services as principal and as agent.

[c] Real-estate activities include investment, development, and management.

and Sweden. Similarly, investment by nonfinancial firms in commercial banks is "unrestricted" in eleven EU countries, "permitted" in Spain, and "restricted" in Italy and Luxembourg.

Most securities activities are on the list of bank activities subject to mutual recognition in the EU included in the Second Banking Directive, which took effect on January 1, 1993 (Box D–1). This means that the single EU passport will allow any EU bank to follow its home-country regulations of securities activities when it operates in another EU country, even if the host-country regulations are different. As a result, lack of harmonization of the regulations on securities activities may hamper the competitive position of some banking systems by causing outflows of funds toward countries permitting the widest range of activities, but it cannot be an obstacle to cross-border competition. This may explain the greater harmonization of securities regulations. In contrast, insurance and real-estate activities are not included in the list of activities subject to mutual recognition, so that whether or not banks are allowed to engage in them depends on both home-country and host-country regulations. Differences in these regulations can create opportunities for regulatory arbitrage and be an obstacle to cross-border competition.

The implementation of several EU directives and of the Basle Accord has not fully harmonized capital standards, which still differ somewhat across EU countries owing to the different lists of items that banks may use to meet capital requirements (Table D–2).[2] Similarly, supervisory practices vary in terms of procedures for examinations and inspections, disclosure of regulatory information, lending limits (on borrowers, sectors, countries, and large exposures), and limits on bank activities abroad (Table D–3). Whereas a single currency will increase pressures for harmonization, decentralized supervisory functions may well allow these differences to persist long enough to affect the location of the banking industry within EMU.

[2] The two main EU directives concerning capital standards are the EC Own Funds Directive (April 1989) and the EC Solvency Directive (December 1989). By January 1, 1993, EU banks had to satisfy a minimum 8 percent risk-weighted total-capital ratio in line with the Basle Accord. A third directive in June 1993, the EC Capital Adequacy Directive (CAD), set capital requirements for the market risk resulting from trading in securities, derivatives, and foreign exchange. CAD II alters CAD to make it consistent with the new Basle capital requirements for market risk allowing for the use of internal models.

BOX D–1

LIST OF BANK ACTIVITIES SUBJECT TO MUTUAL RECOGNITION IN THE EUROPEAN UNION

Acceptance of deposits and other repayable funds from the public.

Advice to undertakings on capital structure, industrial strategy, and related questions, and advice and services relating to mergers and the purchase of undertakings.

Credit-reference services.

Financing leasing.

Guarantees and commitments.

Issuing and administering means of payment (for example, credit cards, travelers' checks, and bankers' drafts).

Lending, including, among other things: consumer credit; mortgage credit; factoring, with or without recourse; financing of commercial transactions (including forfeiting).

Money brokering.

Money-transmission services.

Participation in share issues and the provision of services related to such issues.

Portfolio management and advice.

Safe-custody services.

Safekeeping and administration of securities.

Trading for own account or for account of customers in: money-market instruments (checks, bills, certificates of deposit, etc.); foreign-exchange; financial futures and options; exchange-rate and interest-rate instruments; and transferable securities.

SOURCE: Barth, Nolle, and Rice (1997).

NOTE: The Second Banking Directive, introduced on January 1, 1993, specifies that an EU bank or "credit institution" (that is, deposit-taking and lending institution) may conduct directly or through branches the listed activities throughout the EU so long as its home country authorizes the activities. Subsidiaries of credit institutions governed by the law of the same member state may also conduct the activities, subject to conditions that include 90 percent ownership and a guarantee of commitments by the parent credit institution. Insurance and real-estate activities are not on the list and are therefore determined by both home-country and host-country regulations.

TABLE D–2

COMPONENTS OF CAPITAL FOR MEETING THE CAPITAL STANDARDS OR REQUIREMENTS IN THE EUROPEAN UNION AND G–10 COUNTRIES

	Noncumulative Perpetual Preferred Stock	Current-Year Profit Added (or Loss Deducted)	Intangible Assets Other than Goodwill	Goodwill	Undisclosed Reserves	Hybrid Capital Instruments (Including Cumulative Perpetual Preferred Stock)
Austria	Yes	Yes	No	No	Yes, but limits	Yes, but limits
Belgium	Yes	Yes	No	No	Yes, but limits	Yes, but limits
Canada	Yes	Yes	Yes	No	No	Yes
Denmark	No, does not exist	Yes	No	No	No	Yes, but limits
Finland	Yes	Yes	No	No	No	Yes
France	No, issues not permitted in domestic markets	Yes	No, except lease renewal rights	No	No	Yes
Germany	Yes	No	No	No	Yes, but limits	Yes, but limits
Greece	Yes	Yes	Yes	Yes	No	Yes, but limits
Ireland	Yes, no limits	Yes	No	No	No	Yes, but limits
Italy	Yes, but limits	Yes	Yes	Yes	No	Yes, but limits
Japan	Yes	Yes	Yes	No	No	Yes, but not prevalent
Luxembourg	Yes	Yes	No	No	Yes	Yes
Netherlands	Yes	Yes	Yes	Yes	Yes	Yes
Portugal	Yes	Yes	Yes	Yes	No information	Yes
Spain	Yes	No	No	No	No	Yes, but limits
Sweden	Yes	Yes	No	No	No	Yes with approval
Switzerland	Yes, no limits	Yes	No	No	Yes, but limits	Yes, but limits and not including cumulative perpetual preferred stock
United Kingdom	Yes	Yes	No	No	n.a.	Yes, but limits
United States	Yes	Yes	No, with limited exceptions	No	No	Yes, but limits

TABLE D–2 *continued*

	Subordinated Term Debt	Limited-Life Redeemable Preference Shares	Fixed-Asset Revaluation Reserves	Latent or Hidden Revaluation Reserves	General Loan/Loss Reserves	Investment in the Capital of Other Banks and Financial Institutions
Austria	Yes, but limits	No	Yes, but limits	No	Yes	No
Canada	Yes	Yes	No	No	No	Yes, but back-to-back issues are deducted
Belgium	Yes, but limits	Yes, but limits	Yes, but limits	No	Yes	No
Denmark	No	No, does not exist	No, does not exist	No, does not exist	No, does not exist	No
Finland	Yes	Not applicable	Yes	No	Yes	No
France	Yes	Yes, but not issued	Yes	No	Yes	Yes, but limits
Germany	Yes, but limits	No	No	Yes, with limits	Yes, with limits	No
Greece	Yes, but limits	Yes, but not now used	Yes, but limits	No	Yes	No
Ireland	Yes, but limits	Yes, but limits	Yes, but limits	No	Yes, but limits	No
Italy	Yes, but limits	No, does not exist	Yes, but limits	No	Yes, but limits	No
Japan	Yes	Yes, but not issued	No	Yes	Yes	No, if sole purpose is to raise capital ratio
Luxembourg	Yes	Yes	No	No	Yes	No
Netherlands	Yes	Yes	Yes	Yes	Yes	Yes
Portugal	Yes, but limits	No information	Yes	No information	Yes	No
Spain	Yes, but limits	Yes, but limits	Yes, but limits	No	No	No
Sweden	Yes	No	Yes, with approval	No	No	No
Switzerland	Yes, but limits	No	Yes, but limits	Yes, but limits	Yes, no limits	No
United Kingdom	Yes, but limits	Yes	Yes, with caution	n.a.	Yes, but limits	No
United States	Yes, but limits	Yes, but limits	No	No	Yes, but limits	No

SOURCE: Barth, Nolle, and Rice (1997).

TABLE D-3

COMMERCIAL-BANK SUPERVISORY PRACTICES IN THE EUROPEAN UNION AND G–10 COUNTRIES, 1995

	Examinations and/or Inspections		Required External Audits	Information Publicly Disclosed		Domestic-Bank Activities Abroad
	On-Site	Banks Pay Exam		Bank Examinations or Inspections	Enforcement Actions	Specific Authorization Required
Austria	Yes	Yes	Yes	No	No	No
Belgium	Yes	No	Yes	No	Yes	No, only notification
Canada	Yes, annually	Yes	Yes	No	No	No
Denmark	Yes, usually every 3 years	Yes	Yes	No	No	No
Finland	Yes, not regularly	Yes	Yes	No	No	No
France	Yes	No infor	Yes	No information	No information	No
Germany	Yes	Yes	Yes	No	No	No
Greece	Yes, generally every 2-3 years	No	Yes	No	No	Yes
Ireland	Yes, usually every 18-24 months	No	Yes	No	No	Yes
Italy	Yes, usually every 4-8 years	No	Yes, for banks quoted on the stock exchange	No	Yes	Yes
Japan	Yes	No infor	No information	No information	No information	No information
Luxembourg	Yes, on an ad hoc basis	Yes	Yes	No	No	No
Netherlands	Yes, depends on size and risk profile	No	Yes	No	No	No
Portugal	Yes, usually annually	No	Yes	No	Yes	Yes
Spain	Yes	No	Yes	No	No	Yes, but only branches outside
Sweden	Yes	No	Yes	No	No	No
Switzerland	No	Yes	Yes, official part of supervisory system	No	No	No, only notification
United Kingdom	Yes, but limited and usually biennially	No, not directly	Yes	No	Yes, but not explicitly naming institutions	No
United States	Yes	Yes	Yes, for banks with assets exceeding $500 million	No	Yes	No

TABLE D–3 *continued*

	Domestic-Bank Activities Abroad	Lending Limits on:				
	Limits or Restrictions Placed on Domestic Bank's Foreign Activities	A Single Borrower	Persons Connected with the Bank	Particular Sectors	Country-Risk Exposure	Large Exposures
Austria	No	Yes	Yes	No	No	Yes
Belgium	No, only notification	Yes	Yes	No	No	Yes
Denmark	No	Yes	No	No	No	Yes
Finland	No	Yes	Yes	Yes	Yes	Yes
France	No	No information	No information	No information	No information	No information
Germany	No	Yes	No	No	No	Yes
Greece	No	Yes	Yes	No	No	Yes
Ireland	No	Yes	Yes	No	No	Yes
Italy	No	Yes	Yes	Yes	No	Yes
Luxembourg	No	Yes	Yes	No	No	Yes
Netherlands	Yes	Yes	Yes	Yes	Yes	Yes
Portugal	No	Yes	Yes	No	No	Yes
Spain	No	Yes	Yes	No	No	No
Sweden	No	Yes	No	Yes	No	Yes
United Kingdom	No	Yes	Yes	No	No	Yes
Canada	No	Yes	Yes	No	No	Yes
Japan	No information	Yes	No information	No information	No information	No information
Switzerland	No	Yes	Yes	No	No, but provision	Yes
United States	Yes	Yes	Yes	No	No	No

SOURCE: Barth, Nolle, and Rice (1997).

APPENDIX E: DEPOSIT-INSURANCE SCHEMES

The Directive on Deposit-Guarantee Schemes (May 1994) required all EU countries to introduce a deposit-insurance scheme by July 1995 having three main features: (1) a minimum coverage of ECU 20,000 for each depositor (ECU 15,000 until December 31, 1999); (2) insurance of deposits at foreign branches according to the home-country scheme,[1] unless the foreign branch joins a more favorable host-country scheme; (3) a possibility of excluding from coverage the deposits of financial institutions and insurance companies, as well as bonds issued by banks.

The directive notwithstanding, the structure of deposit-insurance schemes in the EU is far from being harmonized (Table E–1). Deposit-insurance administration is the responsibility of the government in five EU countries, of the banking system in six, and of both in the remaining four. Funding is provided *ex ante* (that is, a reserve fund is established before the occurrence of a bank failure) in two-thirds of the countries and *ex post* (that is, funds are obtained after the occurrence of a bank failure) in the remaining ones, but no country seems to make explicit the source of funding for catastrophic losses. Among *ex ante* funding schemes, only those of Denmark and the United Kingdom specify a minimum-reserve level for the fund. Deposit-insurance premia are risk based only in Italy, Portugal, and Sweden, and the basis on which the premium is calculated varies considerably across the EU. The extent of coverage is uneven, ranging from a low of about $12,000 in Spain to a high of some $118,000 in Italy. In Finland, each depositor is insured in full; full insurance exists in Germany but only up to 30 percent of the bank's capital per depositor. Coinsurance schemes, in which depositors share part of the losses, exist in Ireland and the United Kingdom and to some extent in Portugal, where depositors are fully covered up to a limit and only partially covered for additional amounts.

The lack of harmonization of deposit-insurance schemes may become a source of concern. Various degrees of deposit-insurance protection could trigger regulatory competition between banking systems in the EU, with funds flowing toward countries offering the most protection. Furthermore, given that foreign branches can join a host-country

[1] Until December 31, 1999, however, home-country coverage of deposits at foreign branches of domestic banks cannot exceed the level of host-country coverage.

TABLE E–1

DEPOSIT-INSURANCE SCHEMES FOR COMMERCIAL BANKS IN THE EUROPEAN UNION AND G–10 COUNTRIES

	Administration of System: Government or Industry	Extent or Amount of Coverage per Depositor	*Ex Ante* or *Ex Post* Funding	Fund Minimum-Reserve Level	Base for Premium	Risk-Based Premiums
Austria	Industry	US$260,000	*Ex post*; system organized as an incident-related guarantee facility	n.a.	The deposit-guarantee system shall obligate its member institutions, in case of paying out of guaranteed deposits, to pay without delay *pro arta* amounts that shall be computed according to the share of the remaining member institution at the preceding balance-sheet data as compared to the sum of such guaranteed deposits of the deposit-guarantee system	n.a.
Belgium	Joint government and industry	ECU15,000 until Dec. 1999; ECU20,000 thereafter	*Ex ante*, but in case of insufficient reserves, banks may be asked to pay, each year if necessary, an exceptional additional contribution up to 0.04 percent	No	Total amount of customer's deposits that qualify for reimbursement and that are expressed either in BF, ECU, or another EU currency	No
Canada	Government (Crown Corporation)	Can$60,000	*Ex ante*	No	Insured deposits	No

TABLE E–1 *continued*

	Administration of System: Government or Industry	Extent or Amount of Coverage per Depositor	*Ex Ante* or *Ex Post* Funding	Fund Minimum-Reserve Level	Base for Premium	Risk-Based Premiums
Denmark	Government	DR300,000 or ECU42,000	*Ex ante*	Yes, DKr3 billion	Deposits	No
Finland	Industry	US$29,435	Ex ante	No	Total assets	Yes
France	Industry	F400,000	Ex post	n.a.	The contribution consists of two parts: (1) a fixed part, irrespective of the size of the bank, equal to 0.1 percent of any claim settled and with a F 200,000 ceiling and (2) a proportional part, varying according to a regressive scale relative to the size of the bank contributing, based on deposits and one-third credits	n.a.
Germany	Industry	100 percent up to a limit of 30 percent of the bank's liable capital. Official coinsurance 90 percent to ECU20,000	*Ex ante*. Additional assessments may be made, however, if necessary to discharge the fund's responsibilities. These contributions are limited to twice the annual contribution	No	Balance-sheet item "Liabilities to Customers"	No
Greece	Joint government and industry	ECU20,000	*Ex ante*	No	Total deposits	

Ireland	Government	90 percent to ECU15,000	*Ex ante*	No, but minimum premium rate of £20,000	Total deposits excluding interbank deposits and deposits represented by negotiable certificates of deposit	No
Italy	Industry	100 percent of first Lit200 million	*Ex post*; banks commit *ex ante*; contributions, however, are *ex post*	No	Maximum limit for funding the whole system: Lit4,000 billion. Contributions are distributed among participants on the basis of deposits plus loans minus own funds, with a correction mechanism linked to deposit growth	Yes
Japan	Joint government and industry	US$71,000, but full coverage until March 2001	*Ex ante*	No	Insured deposits	No
Luxembourg	Industry	Coinsure 90 percent to ECU15,000 until Dec. 1999, then to ECU20,000	*Ex post*	n.a.	Banks' premiums based on percentage of loss to be met	n.a.
Netherlands	Joint government and industry	ECU20,000	*Ex post*	n.a.	Amount repaid in compensation to insured is apportioned among participating institutions. The contribution in any one year shall not exceed 5 percent of an institution's own funds and of all institutions' own funds	n.a.

TABLE E–1 *continued*

	Administration of System: Government or Industry	Extent or Amount of Coverage per Depositor	*Ex Ante* or *Ex Post* Funding	Fund Minimum-Reserve Level	Base for Premium	Risk-Based Premiums
Portugal	Government	100 percent up to ECU15,000; 75 percent up to ECU15,000–30,000; 50 percent up to ECU30,000–45,000	*Ex ante*. But the payment of the annual contributions may be partly replaced, with a legal maximum of 75 percent, by the commitment to deliver the amount due to the fund, at any moment it proves necessary	No	Guaranteed deposits	Yes
Spain	Joint government and industry	ECU15,000 until Dec. 1999; ECU20,000 thereafter	*Ex ante*	No	Deposits	No
Sweden	Government	SKr250,000	*Ex ante*	No	Covered deposits	Yes
Switzerland	Industry	SwF30,000	*Ex post*	n.a.	Two components: (1) fixed fee in relation to gross profit; (2) variable fee depending on share of total protected deposits of an individual bank	n.a.
United Kingdom	Government	90 percent of protected deposits, with the maximum amount of deposits protected for each depositor being £20,000 (unless	*Ex ante*; Banks make initial contributions of £10,000 when a bank is first authorized, further contributions if the fund falls below	Yes, the fund is required by law to maintain a level of £5 million to £6 million, but the Deposit Protection Board may decide to	All deposits in EEA currencies less deposits by credit institutions; financial institutions; insurance undertakings; directors, controllers,	No

United Kingdom (*contd.*)		the sterling equivalent of ECU22,222 is greater). Thus, the most an individual can collect in a bank failure is £18,000 or ECU20,000 if greater	£3 million, not exceeding £300,000 per bank, based on the insured-deposit base of the banks involved, and special contributions, again based on the insured-deposit base of the banks involved, but with no contribution limit	borrow to meet its needs	and managers; secured deposits, CDs, deposits by other group companies, and deposits that are part of the bank's own funds	
United States	Government	US$100,000	*Ex ante*	Yes, 1.25 percent of insured deposits	Domestic deposits	Yes
EU (EC Directive on Deposit-Guarantee Schemes)	Only directs that each member state shall ensure that within its territory one or more deposit-guarantee schemes are introduced and officially recognized	The aggregate deposits of each depositor must be covered up to ECU20,000. Until Dec. 31, 1999, member states in which deposits are not covered up to ECU20,000 may retain the maximum amount laid down on their guarantee schemes, provided that this amount is not less than ECU15,000	Determined within each member state	Determined within each member state	Determined within each member state	Determined within each member state

SOURCE: Barth, Nolle, and Rice (1997); Garcia (1999); IMF Country Desk.

scheme, situations may arise in which foreign branches obtain "insurance coverage in a country even though that country has no authority to regulate the risk-taking behavior of those branches because of mutual recognition" (Barth, Nolle, and Rice, 1997, p. 25).

APPENDIX F: ESCB FUNCTIONS RELATED TO PRUDENTIAL SUPERVISION AND THE STABILITY OF THE PAYMENTS AND FINANCIAL SYSTEMS

The ESCB Statute (Art. 25[1]) and the Maastricht Treaty (Art. 105[4,5,6]) assign to the ESCB some functions related to prudential supervision and the stability of the financial system. The flows of supervisory information between the ECB and the competent authorities is also regulated by the so-called "BCCI Directive" (Directive 95/26/EC of June 29, 1995; see European Commission, 1996, pp. 77–90). The 1997 *Annual Report* of the EMI (1998, pp. 61–63) provides some clarification on how the EMI and the Banking Supervisory Sub-Committee expect these provisions to be implemented in EMU.

Article 25(1) of the ESCB Statute envisions a specific advisory function for the ECB in the field of Community legislation relating to the prudential supervision of credit institutions and the stability of the financial system. The EMI report specifies that this function refers to the scope and implementation of Community legislation in these fields and that it should be considered "optional," offering the ECB an instrument by which it will be able to contribute to EU legislation. Article 105(4) of the Treaty (which applies to all EU countries with the exception of the United Kingdom) contemplates a somewhat stronger role for the ECB by stipulating that it must be consulted on draft Community and national legislation falling within its field of competence. The Council Decision of June 29, 1998 (98/415/EC) identifies the precise scope of this provision, indicating that the ECB should be consulted on rules regarding financial institutions, insofar as they materially influence the stability of financial institutions and markets.

Article 105(5) of the Treaty stipulates that "the ESCB 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 EMI report indicates that the main objective of this provision was to ensure an effective interaction between the ESCB and the national supervisory authorities. It has been agreed that this interaction will take two forms. First, the ESCB and, in particular, the ECB will promote cooperation among the EU national supervisory authorities (all of them, regardless of the fact that Article 105[5] applies only to countries participating in EMU),

with a view to achieving "a common understanding on relevant supervisory policy issues." This ECB function will be performed with the assistance of a specific committee, composed of national supervisors and NCB representatives, and is expected "to supplement" the current framework for multilateral cooperation within the EU and "to interact smoothly" with the cooperation promoted by other supervisory forums (the Banking Advisory Committee and the Groupe de Contact at the EU level and the Basle Committee at the G–10 level).

Second, and more important, the EMI report indicates what common understanding has been reached among banking supervisors on the basic features of the flow of information to the ESCB, in light of the relevant provisions of the BCCI Directive. The directive removed all legal obstacles to the exchange of information between the authorities supervising credit institutions, investment firms, or insurance companies and the staff of central banks or "other bodies with a similar function in their capacity as monetary authorities"—including the ECB. The implementation of this directive remained ambiguous, however, because it neither specifies the information that may be exchanged nor creates an obligation to provide it. Although considerable ambiguity remains, the EMI report provides some clarification on the degree of information sharing. The ESCB is *not* going to receive supervisory information on a systematic basis, so that it cannot use it for its risk management,[1] but banking supervisors "will be prepared to consider" requests from the ESCB in this area and, in the event of a banking crisis with systemic implications, to inform the ESCB on a case-by-case basis. This common understanding among EU supervisors is, however, intended to cover the specific needs of the ESCB in its capacity as monetary authority. It remains possible that another, perhaps wider, understanding might be sought (or agreed but not publicly announced) for the provision of emergency liquidity assistance.

Article 105(6) of the Treaty states that "the Council may, acting unanimously on a proposal from the Commission and after consulting the ECB and after receiving the assent of the European Parliament, confer upon the ECB specific tasks concerning policies relating to the prudential supervision of credit institutions and other financial institutions with the exception of insurance undertakings." The commission has not yet taken any initiative in this direction, and the 1997 EMI

[1] This is already the general agreement regulating relations between central banks and supervisors in most EMU countries.

report (EMI, 1998, p. 62) states that "at this stage, it is felt that it would be premature to envisage any transfer of supervisory powers from national authorities to the ECB."

The ESCB is given a more explicit role in relation to the working of the payments system. Article 105(2) of the Treaty stipulates that one of the basic tasks of the ESCB "shall be to promote the smooth functioning of the payments system." Article 22 of the ESCB Statute is more specific, stating that "the ECB and national central banks may provide facilities, and the ECB may issue ECB regulations to ensure efficient and sound clearing and payments systems within the Community and with other countries." In addition, an agreement reached in 1994 between the Banking Supervisory Sub-Committee and the Payments System Sub-Committee disciplined the flow of information between supervisory authorities and NCBs as overseers of national payments systems in the event of a payments-system crisis. This agreement is analogous to the more recent one on banking crises, but—because of its earlier date—it did not mention the ECB and had to be updated in this respect.

POSTSCRIPT

A milestone in European integration was achieved when the third and final stage of EMU began on January 1, 1999, with the introduction of the euro.[1] This postscript provides a progress report on the integration of European financial markets, the implementation and performance of the EMU payments and securities settlement systems, the consolidation and restructuring of the banking system, and on the broader financial-policy issues such as financial supervision, regulation, and crisis management.

The launch of the euro went smoothly, reflecting careful preparations for the considerable operational and logistical challenges of the conversion weekend. In the first months of EMU, the TARGET payments system effectively transferred liquidity among participating countries, and arbitrage substantially equalized money-market interest rates across the euro area. Even with these early successes, it should not be surprising that a single pan-European capital market has not yet emerged from the previous eleven national markets. Some features of the EMU infrastructure may still be impeding the full integration of money markets, especially for secured (repo) transactions, but these obstacles do not seem insurmountable and initiatives are under way to eliminate them. The consolidation and integration of bond, equity, and derivatives markets may be delayed, reflecting remaining challenges in removing problems related to the incomplete and inefficient cross-border links among securities settlement systems. Meanwhile, consolidation and restructuring in the European banking sector is occurring mainly within national boundaries, but it is likely that the single currency will gradually increase pressures for cross-border mergers and the creation of pan-European institutions. National supervisors and regulators are stepping up their coordination efforts, and important agreements have been reached in the area of crisis management.

Money-Market Integration and EMU Financial Infrastructure

Progressive integration of the EMU money market. The introduction of a single currency has had an immediate impact on the money

[1] The only additional remaining step is the introduction of notes and coins, which will take place by 2002. The "Eurosystem," which consists of the ECB and the eleven NCBs of the participating member states, has responsibility for monetary policy for the entire euro area.

markets of the countries participating in EMU. Starting on January 1, 1999, NCBs could no longer tailor monetary policies to the needs of their national economies. Although NCBs still implement monetary-policy decisions, the ECB decides the timing and the size of refinancing operations on the basis of EMU-wide considerations. Effective links among national money markets are therefore necessary to redistribute liquidity across national borders whenever national banking systems experience asymmetric liquidity shocks or do not obtain sufficient liquidity through the Eurosystem repo auctions.

The experience of the first months of EMU has been positive. The TARGET system has provided an effective means for cross-border payments. European private repo and money markets have been distributing liquidity across borders so as to ensure the convergence of overnight rates across participating countries, and financial systems and institutions that have excess liquidity have been able to supply it to those in the euro area that need it.

At the same time, some elements of the financial infrastructure are impeding full integration. Market participants have noted that certain features of the euro financial infrastructure discourage or prevent them from undertaking some cross-border business within the euro area, especially when it involves cross-border transfer of collateral. These features include differences in market structure (such as the extent of bilateral interbank credit lines), national differences in infrastructure (such as payments and securities settlement systems), and national differences in policies (such as tax, legal, and regulatory environments, including differences in the legal treatment of repo operations). As a result, single integrated markets for money, repo, and securities will probably not emerge until many of the differences in market structure, infrastructure, and financial policies are fully resolved. Some of these features will be difficult and time-consuming to change, owing to technical problems as well as conflicting interests among EMU financial centers.

TARGET: A Prerequisite for Money-Market Integration

The launch of TARGET went relatively smoothly. Fewer problems were encountered than some market participants had expected, and minor glitches were attributable to operational errors by banks rather than shortcomings of the system. The only exception was the January 29 breakdown of the link between the French RTGS system and TARGET, which resulted in a number of rejected payments and a greater-than-usual recourse to the Eurosystem standing facilities.

Some market participants had suggested before the launch of EMU that the opportunity cost of the collateral needed to obtain intraday credit in TARGET, and its relatively high price per transaction, might encourage banks to send high-value payments—the kind of payments that carry potential systemic risk—through alternative netting schemes. The first months of EMU have helped dispel these concerns, because most cross-border high-value payments have been sent through TARGET (Figure P–1).[2]

The statistics on the first five months of TARGET operations are reassuring, but it may take some time before a judgment can be reached about the role that TARGET will play. First, the distribution of payments observed in the first five months is widely expected to change because the total number, and value, of cross-border payments sent through TARGET, EBA, and EAF, is likely to increase in future months with the gradual closure of the numerous remaining correspondent banking accounts. (This prospect is made more likely by the fact that the total volume of cross-border payments sent by way of the three main payment schemes is currently well below the volume estimated before the start of EMU). Second, in view of some technical problems encountered in the initial phase (see below), the overwhelming concern with cross-border payments has so far been timing, rather than cost. This may have favored TARGET. Finally, some payments recorded in TARGET are actually transactions within the same banking group and thus carry no systemic risk.[3]

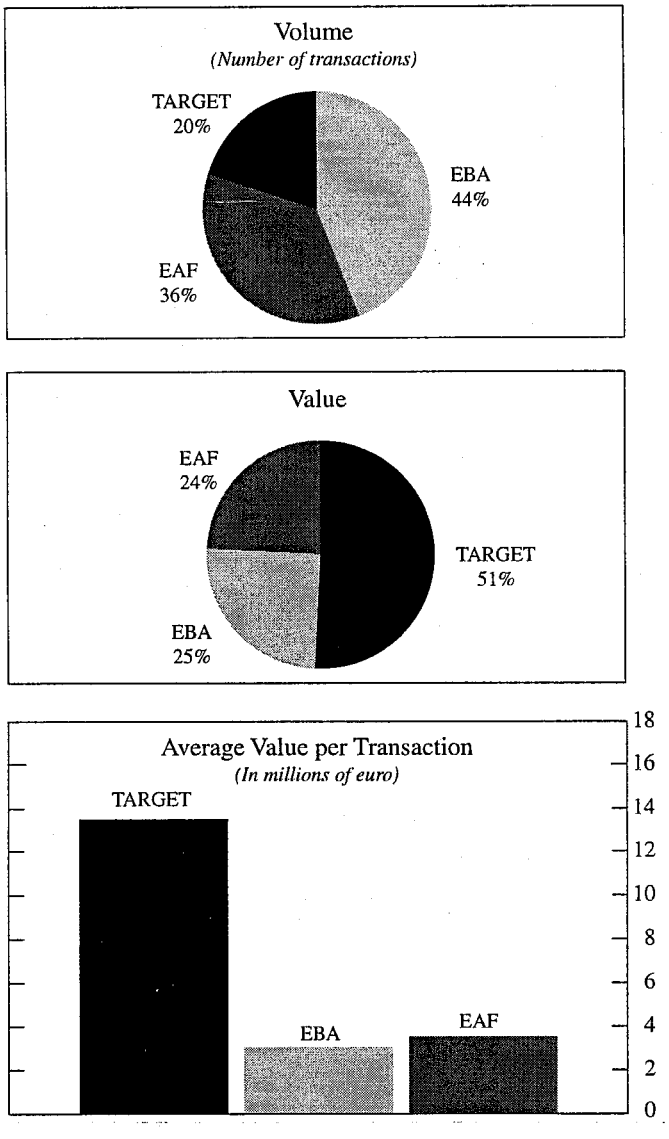
The multiplicity of payments systems available for sending cross-border payments and the preference of different groups of banks for different systems have created problems in the coordination between paying and receiving banks. In the absence of priority rules about the system through which cross-border payments should be sent, a receiving bank did not know, in the first few months after the launch of the euro, whether it would receive the funds directly through TARGET, from one of its correspondent banking accounts, or from another

[2] Whereas EBA payments can all be considered cross-border and TARGET cross-border payments are clearly identified in ECB's statistics, it is not possible to know the cross-border share of EAF payments, part of which is domestic (German). In Figure P–1, EAF payments are assumed to be all cross-border, thus overestimating cross-border payments.

[3] One example is the 13 to 14 billion euros in TARGET payments that are exchanged at the beginning and end of each day between U.K. banks and their branches on the continent.

FIGURE P–1

AVERAGE DISTRIBUTION OF CROSS-BORDER PAYMENTS IN EMU AMONG EAF, EBA, AND TARGET, JANUARY–MAY 1999



SOURCE: European Central Bank.

branch of the same bank. These difficulties prompted some bank associations to forge common understandings and practices that have helped to ease some of these problems.

A remaining issue concerns the timing of payments. In an RTGS system, payments can, in principle, be evenly distributed during the day. Within TARGET, however, there has been a tendency for some large payments to be sent late in the day, which often causes banks to scramble to meet obligations just before closing. Such timing problems seem to stem from preferences to delay payments and thus minimize demand for costly intraday liquidity. If all banks were to manage liquidity in this way, there would be a substantial risk of gridlock. There have also been some concerns about the impact on liquidity within TARGET of the behavior of banks that have reportedly been minimizing their need for costly collateral by requesting payments through TARGET, which settles during the day, while making payments with EBA, which settles at the end of the day.

In sum, although TARGET may be considered to have worked reasonably well during its first months of operations, some issues associated with the existence of multiple competing payments systems and the cost of intraday liquidity in TARGET seem to remain. An option for EMU policymakers to promote is more orderly competition among payments systems. Discretion about the timing of payments, and the large number of alternatives for routing payments, may be unduly complicating liquidity management for European financial institutions at a time when the treasury operations of banks have already become more complex owing to the new environment created by the introduction of the euro.[4]

The Progress Toward a Single EMU Money Market

Recourse to ECB's standing facilities and cross-border interbank flows. Although ECB repo auctions may give rise to an unequal initial distribution of liquidity across banks and banking centers, banks can resort to the ECB's marginal lending and deposit facility, and an integrated and efficient EMU-wide interbank money market can help to transfer liquidity effectively to areas where it is most needed.

Banks in EMU can resort to the ECB's marginal lending and deposit facilities to borrow or deposit overnight liquidity with the Eurosystem.

[4] The ECB (June 1999, p. 48∗) has itself acknowledged that problems remain: "The present lack of market conventions has resulted in imbalances between payment systems and makes it difficult for banks to manage their payment flows efficiently. Therefore, the ECB is urging the industry to make a considerable improvement in this field very soon."

Because the recourse to these facilities is unrestricted for any bank having sufficient eligible collateral, the interest rates on them define the floor and the ceiling for overnight rates. In principle, banks would use these facilities only when market rates approach those available through the facilities, because otherwise they could obtain better terms in the market. In practice, banks made extensive use of the deposit and lending facilities during the first months of EMU, even when overnight rates substantially differed from the rates on the facilities (see bottom panel of Figure P–2). These episodes cannot easily be explained by intraday interest-rate developments (see ECB, May 1999, p. 42, box 3). On several occasions, both facilities were used for considerable amounts on the same day. There have also been instances of spikes in the overnight rate, despite apparently ample aggregate liquidity in the system (ECB, March 1999, p. 12). These occurrences—the frequency of which has diminished in recent months—suggest that at the start of EMU, the interbank market may not yet have been intermediating funds as efficiently as possible. Moreover, in countries with more efficient interbank markets, deposit and lending facilities have been used less frequently and to a lesser extent.[5] The heavy reliance on standing facilities may also reflect start-up inefficiencies of EMU payments systems or bank problems in managing payments flows in the new single-currency environment.

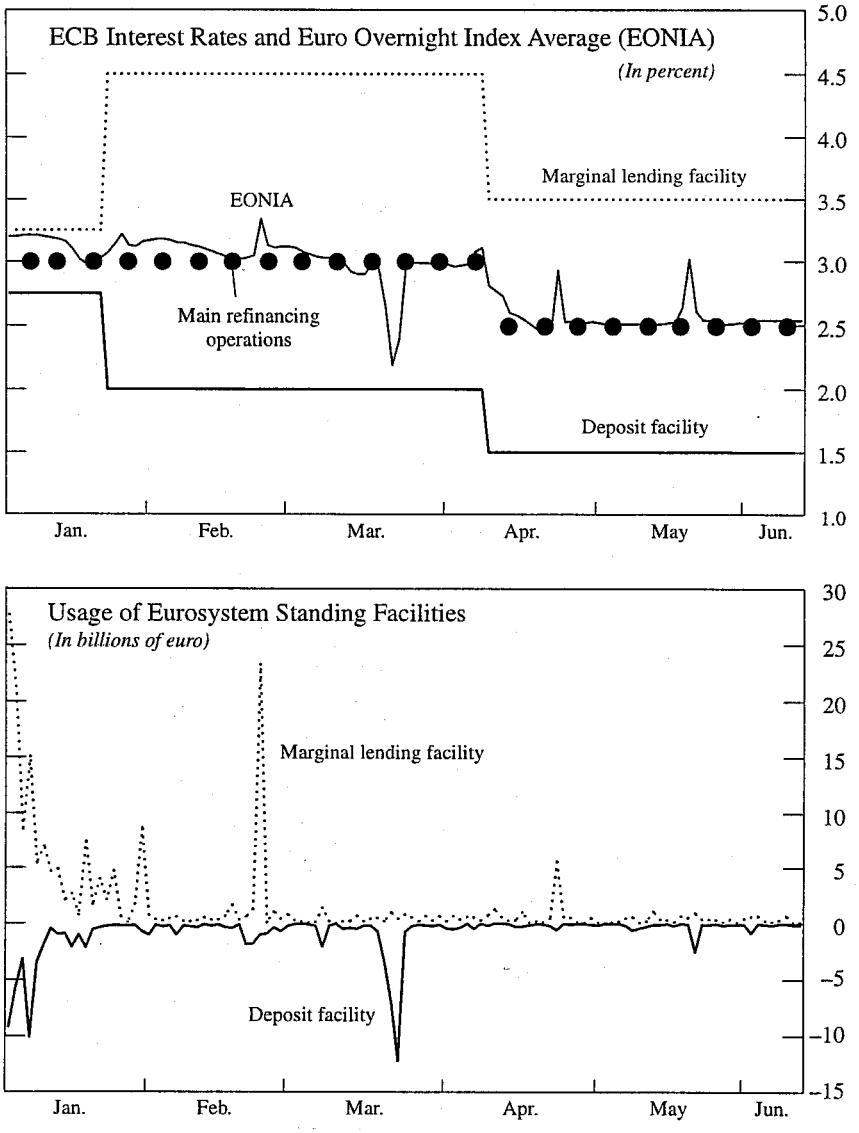
In EMU, the need to redistribute liquidity across national borders will likely lead to a larger share of cross-border interbank loans and deposits with respect to other euro-area countries in each national banking system. By contrast, domestic interbank transactions will likely diminish. In the first three months of EMU, these tendencies were clearly recognizable in Italy and, to a smaller extent, in France and Germany, but no large or sudden change in the pattern of cross-border interbank flows seems to have occurred (Table P–1).

Interest rates in the unsecured interbank market. Whereas quantity data on the recourse to the Eurosystem marginal facilities and cross-border interbank flows suggest that banks in each country still tend to deal primarily with their NCBs and with other domestic banks, overnight interest-rates data indicate that existing cross-border flows have sufficed

[5] In Italy, for example, whose electronic interbank market is generally perceived as one of the most efficient in EMU, the recourse of banks to the marginal lending and deposit facilities in the first four months of EMU accounted for only 1.7 percent and 7 percent of the total, respectively, whereas the funds intermediated by the Italian banking system accounted for more than 10 percent of the total for the entire EMU area (Banca d'Italia, 1999, p. 183).

FIGURE P–2

EUROPEAN CENTRAL BANK: INTEREST RATES AND STANDING FACILITIES, JANUARY 4–JUNE 11, 1999



SOURCES: Bloomberg Financial Markets L.P.; Datastream; European Central Bank.

TABLE P–1

DISTRIBUTION OF INTERBANK LOANS AND DEPOSITS ACROSS EMU COUNTRIES BEFORE AND AFTER EMU

(*In percent*)

	Interbank Loans		Interbank Deposits	
	Before EMU	After EMU	Before EMU	After EMU
France				
Domestic	—	—	87.0	86.0
Other euro area	—	—	13.0	14.0
Germany				
Domestic	90.8	89.1	87.4	84.8
Other euro area	9.2	10.9	12.6	15.2
Italy				
Domestic	71.0	66.0	61.0	58.0
Other euro area	29.0	34.0	39.0	42.0

SOURCES: IMF staff calculations based on data from the Banca d'Italia (1999, table aD15), the Banque de France (1999, table 4.2), and the Deutsche Bundesbank (May 1999, table IV.1).

NOTE: The data periods are, for before EMU: France (December 1998), Germany (January to December 1998), and Italy (June to December 1998). For after EMU, they are: France (March 1999), Germany and Italy (January to March 1999).

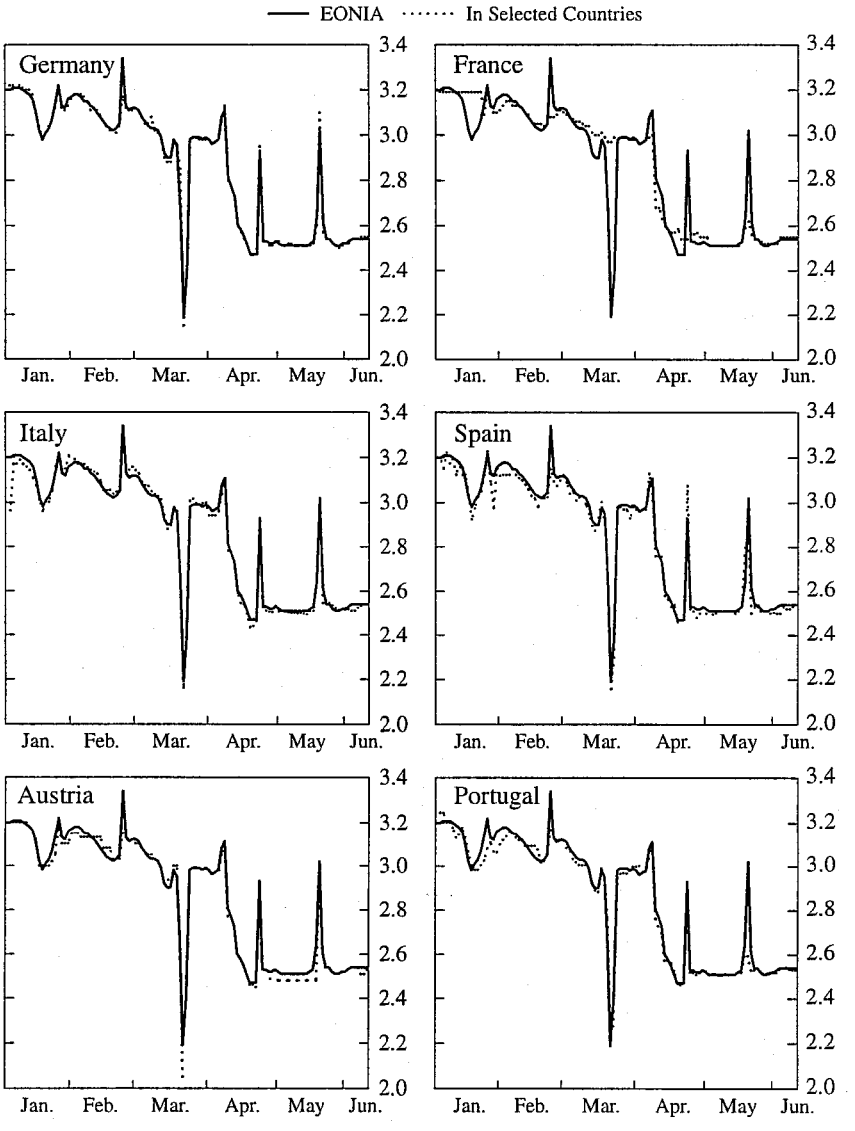
largely to eliminate the differentials between countries in the unsecured money market. Figure P–3 plots the euro overnight index average (EONIA: the weighted average of the rates on unsecured overnight contracts reported by a panel of fifty-seven major institutions in the euro area) against selected indices of national overnight rates, confirming that overnight rates in EMU have substantially converged.[6]

Although interbank average rates are well aligned across markets and volatility around policy rates is not large, it is not clear that the eleven national money markets linked by TARGET are operating fully as a single market. Bid-ask spreads, for example, are wider in some markets than others, suggesting that some markets are more efficient than others

[6] The coverage of the national indices used in Figure P–3 is likely to differ from that of the EONIA panel. The ECB does not publish interest rates for the national components of the EONIA, but it has indicated that the dispersion among the average national interest rates reported by the credit institutions in the panel is minimal. Since the end of the first week of EMU, their weighted standard deviation has fallen below 2 basis points and has stabilized around that level (ECB, May 1999, p. 35, box 2).

FIGURE P–3

OVERNIGHT RATES ON UNSECURED INTERBANK FUNDS IN THE EURO AREA, JANUARY 4–JUNE 10, 1999



SOURCES: Bloomberg Financial Markets L.P.; Datastream.

in intermediating liquidity (Table P–2). Moreover, whereas bid-ask spreads in EMU countries are not unusually large in relation to U.K. or U.S. spreads, in some countries, they are larger than in pre-EMU Germany.

Progress toward integration of money markets. The observation that there is not yet a single money market but, rather, eleven national markets linked to each other by reasonably efficient arbitrage may reconcile the evidence based on quantities (recourse to the eurosystem marginal facilities and cross-border interbank flows) and interest rates. The initial distribution of liquidity at the ECB auctions would not be an issue if the redistribution of liquidity in the unsecured money market were efficient. That there were concerns among market participants and NCBs during the start of EMU about the initial distribution of liquidity suggests possible inefficiencies, which may reflect two factors. First, as the data on cross-border interbank deposits and loans seem to indicate, there may still be relatively few bilateral cross-border interbank credit lines to support cross-border lending in the unsecured interbank market. The limited number of such credit lines is partly a legacy of the pre-euro system; until December 31, 1998, the overwhelming majority of interbank credit lines were between banks in the same country, and it will take time for banks to establish new interbank relationships and assess the associated counterparty risk. In this regard,

TABLE P–2

BID-ASK SPREADS OF OVERNIGHT INTERBANK RATES FOR SELECTED COUNTRIES, 1998-1999

(*In basis points*)

	1998		1999	
	Mean	Median	Mean	Median
EMU countries				
Austria	14.9	15.0	10.0	10.0
France	10.4	10.0	11.8	12.0
Germany	6.5	5.0	—	6.0
Portugal	—	—	—	7.0
Spain	6.4	5.0	9.1	10.0
Non-EMU countries				
United Kingdom	11.6	12.5	15.3	12.5
United States	—	6.3	—	6.3

SOURCES: Bloomberg Financial Markets L.P.; Datastream; Federal Reserve Bank of New York; Reuters; and IMF staff estimates.

it is also possible that a single consolidated payments system for all EMU countries might have encouraged banks to extend cross-border credit lines more rapidly than the current, nationally focused, system does. A single European electronic money market, linked to a single RTGS payments system, could also address some of the shortcomings of the current interbank market.

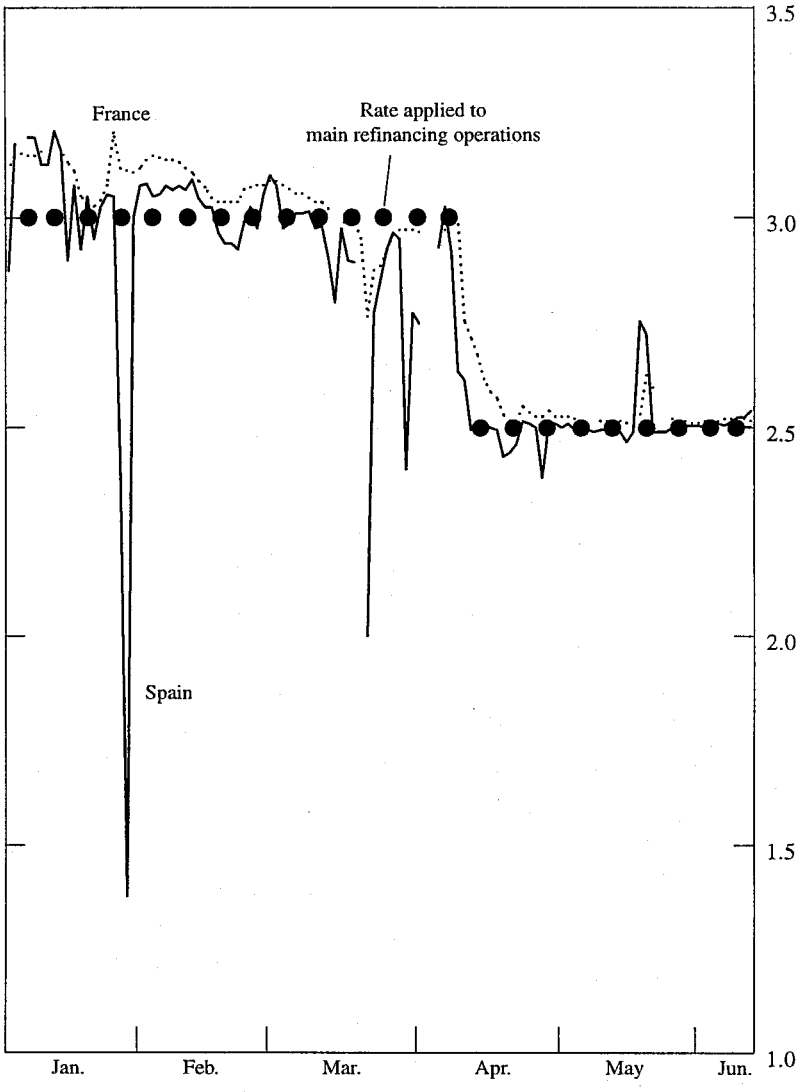
It is not clear whether remaining partial segmentation of the money market for unsecured funds has serious implications for EMU money markets. There are some, but presumably minor, implications for market efficiency, associated with different bid-ask spreads across countries and with frequent recourse to costly marginal facilities. It is an open question how segmentation affects financial stability. On the one hand, segmentation could limit contagion and systemic effects from the failure of a single financial institution. On the other hand, it could complicate pricing and the distribution of liquidity during times of turbulence and thereby possibly affect crisis management. In the event of a liquidity crisis, the unsecured money market might not yet be able to distribute the injected liquidity easily to the institutions that need it most—particularly if some of these institutions are short of the eligible collateral needed to access the ECB's lending facilities and face binding limits on existing credit lines that prevent them from obtaining liquidity from other banks.

Repo markets and securities settlement systems. The development of a single EMU market for private repo transactions would appear to be more challenging than the development of a single unsecured interbank market because there are additional complexities associated with back-office functions within financial institutions and securities settlement systems. Although national overnight repo rates seem to have largely converged across EMU (see, for example, Figure P–4 comparing French and Spanish rates), the main issue regarding EMU repo markets is the absence of reliable and efficient links between national securities settlement systems, a gap that seems to be hampering the cross-border use of collateral.

European securities are now deposited in thirty-one continental and national depositories in Europe (compared to three in the United States) and in a few international depositories (Euroclear and Cedel). Although technology permits a single EMU-wide trading platform for all types of securities, it would be difficult to create a system from existing national systems that would clear and settle cross-border transactions with speed and safety. To support pan-European repo trading, these systems could be connected by real-time DVP links or

FIGURE P–4

OVERNIGHT REPO RATES IN FRANCE AND SPAIN, JANUARY 4–JUNE 11, 1999



SOURCES: Bloomberg Financial Markets L.P.; European Central Bank.

consolidated into a few securities settlement systems.[7] Market participants have suggested, however, that the choice between a centralized or decentralized market structure for securities settlement systems seems to be a politically sensitive issue because of its implications for competition among financial centers. At present, the decentralized model has prevailed, but existing national systems are being linked nonetheless,[8] and the legal problems associated with a multiplicity of different national repo contracts are being addressed.[9] Initially, these links will not be real-time DVP, so that the cross-border use of securities will remain subject (at a minimum) to liquidity risk.

To overcome the problems that the inefficiencies of securities settlement systems created for the cross-border use of collateral in monetary-policy operations, EMU central banks created a correspondent central-banking (CCB) network of accounts by which securities deposited by a financial institution at one NCB could be used by the same institution as collateral in repo operations with another NCB. In the first months of EMU, not all these communications links between NCBs have worked efficiently. For example, some institutions located in one EMU country trying to use the CCB links to obtain liquidity from the NCB of that country against collateral deposited at another NCB reportedly waited six hours for confirmation. Owing to this confirmation lag, the banks were required to undertake another (bridge) operation with their NCB, using domestic collateral deposited at the local securities settlement system, to cover their immediate need for liquidity. A similar need for bridge financing apparently exists when a repo is rolled over while NCBs exchange confirmation messages. These problems may be significant enough to prevent private institutions from using collateral across borders in some instances.

Facilitating cross-border transfers of securities may contribute to the development of a single repo market in EMU, but, more importantly, it may contribute to a reduction of systemic risk, because of the ensuing

[7] There are already several means—such as taking out membership in a foreign securities settlement system or engaging the services of a private-sector custodian—by which a counterparty in one country might hold a security in a securities settlement system in another country, even without any cross-border links or system consolidation, but these methods are not available (or attractive) to all investors (BOE, 1999).

[8] In May 1999, the two large European international depositories, CEDEL and Euroclear, proposed two competing systems of links and alliances among national securities settlement systems. In the same month, the ECB published a list of twenty-six links eligible for cross-border use of collateral on a free-of-payment basis.

[9] The projected "Euromaster Agreement" has been designed to overcome legal problems.

larger share of collateralized cross-border interbank transactions. Options for improvements in the infrastructure for clearing and settlement might include strengthening the links between systems and improving individual systems or creating a single unified system that could serve all European markets. Although private solutions to these problems might be preferable to wholly public ones, there may be some scope for public policy to provide incentives and guidance.

Enhancing efficiency and integration of unsecured and secured EMU money markets. The limited integration of unsecured and secured money markets in Europe reflects a common set of features in these markets: the fragmented structure of trading and counterparty relationships and the fragmented (and in some cases weak) supporting infrastructures, including clearing, settlement, and payments systems. These features reflect, to a certain extent, the decentralized operating procedures for the distribution of liquidity used by the Eurosystem. By entrusting the implementation of monetary policy to NCBs, the framers of EMU have, in effect, supported a level playing field in the competition among European financial centers. They have also, however, helped to perpetuate the nationally oriented infrastructure of payments and securities settlements systems, because this infrastructure is needed to implement monetary policy in a decentralized fashion.[10]

In summary, there are three measures that might make the current system of European money and private repo markets more unified and efficient. The first measure might be the creation of a single, Europe-wide electronic market for unsecured funds. The second might be the improvement of the infrastructure for clearing and settlement. The third measure might be the creation of incentives to encourage more orderly competition among payments systems. Discretion about the

[10] Similar issues emerge in relation to the integration of securities markets. The creation of pan-European exchanges is delayed by obstacles at two levels: technical obstacles that are, in principle, straightforward to overcome; and policy-related obstacles that will be more difficult to overcome, particularly as they serve to protect domestic markets. As with the money markets, problems in securities settlement systems and other back-office functions tend to impede the creation of a single pan-European market for bonds, equity, and derivatives. Additional impediments to consolidation of exchanges are created by differences in tax regimes and other differences in legal and regulatory environments across European countries. Because it is unlikely that these impediments will be addressed soon, market participants themselves may find ways around these barriers. For example, the owners of the successful Euro-Mercato telematico dei titoli di Stato (Euro-MTS) system for trading benchmark European government bonds incorporated their company outside of EMU (in the United Kingdom) as a broker-dealer for regulatory reasons. Exchanges could also be located outside the EU or offshore in order to avoid impediments.

timing of payments, and the large number of alternatives for routing payments, are unduly complicating liquidity management for European financial institutions.

Consolidation and Restructuring of Banking Systems

For the time being, both official preferences and market forces are encouraging consolidation and restructuring of European banking systems within national markets, rather than across borders.[11] There are economic reasons for domestic consolidation, including economies of scale and scope from mergers of retail and universal banks within highly fragmented national systems. There are also cultural and legal features that discourage cross-border mergers. Importantly, authorities in some countries seem reluctant to allow increased foreign participation until the process of domestic consolidation has produced "national champions" that are judged to be large enough both to discourage takeovers by foreign banks and potentially to undertake cross-border acquisitions themselves.

Although there may be reasons for consolidation to continue within national banking systems, there are constraints on the extent of domestic consolidation. In France and Germany, for example, a majority of domestic banking assets are located with banks having legal and ownership structures that largely insulate them from the consolidation efforts of commercial banks. Absent a change in these institutional factors, the pressures to increase size might inevitably lead large banks to look beyond national boundaries, even in the face of incomplete domestic consolidation. In addition, once one big merger shows that cross-border

[11] The exceptions to this trend are the Scandinavian and Benelux countries, where some cross-border mergers have occurred, and to some extent Italy, where foreign participation is substantial. Italian banks with a significant participation of foreign investors account for close to half of the domestic deposits. However, apart from one holding of 22 percent (by France's Crédit Agricole), this mainly reflects a substantial number of holdings of just under 5 percent, the level at which Banca d'Italia approval must be sought. The role of foreign partners is still modest in France and negligible in Germany. In the case of France, however, the core shareholder group of the privatized Crédit Lyonnais, which controls 33 percent of the capital and voting rights, comprises three foreign banks and the French arm of a German insurance company, together with three French institutions. Some banks from Spain and Scandinavia have expanded across borders into non-EMU (and, indeed, non-EU) countries, with the objective of preserving profitability and increasing their size and market value as a possible defense in the ongoing process of consolidation.

consolidation is under way, the relatively small number of attractive targets in some countries may lead to a "floodgate" effect, because banks will wish not to be left out of the process.[12]

There are indications that national authorities sometimes influence the consolidation process involving domestic entities, as in the case, for example, of the declared opposition of some supervisors and regulators to hostile takeovers in the banking sector. In France, the authorities expressed a desire for the three large banks (Banque Nationale de Paris, Paribas, and Société Générale) currently involved in takeover bids to come to an amicable agreement. In Italy, the authorities expressed a desire for further consolidation, but the Banca d'Italia's opposition to two proposed mergers (Banca Commerciale Italiana and Unicredito, and Banca di Roma and San Paolo-Istituto Mobiliare Italiano) was in part attributed by market participants to the hostile nature of the bids (Fazio, 1999).

Financial Supervision, Regulation, and Crisis Management

Will supervisory and regulatory frameworks in EMU keep pace? National supervision and regulation in many countries is being challenged by the increased blurring of commercial banking, investment banking, insurance, and asset management. Challenges are likely to emerge within the euro area also because of the probable tendency toward greater reliance on securitized market-oriented finance, rather than bank-intermediated finance; the likely emergence of pan-European exchanges for securities and derivatives trading; and the occurrence of cross-border mergers between financial institutions.[13]

National-level structures in most European countries divide supervisory and regulatory responsibilities among several agencies (with the notable exception of the United Kingdom, which recently introduced a single regulator, the Financial Services Authority [FSA]). Although European authorities consider the existing division of responsibilities at the national level to be working reasonably well, some rationalization is probably desirable and might enhance supervision. However, full-fledged FSA-style reforms seem unlikely in the near future; some uncertainty

[12] In a related context, it has been suggested that the recent large Spanish merger (Banco Santander and Banco Central Hispano Americano) may have acted as a trigger for the subsequent domestic merger activity in France and Italy discussed below.

[13] See Karel Lanoo (1998) with regard to the challenges facing prudential supervision in EMU.

about the outcome of the U.K. reform is encouraging a wait-and-see attitude among most continental European authorities.

As for structures at the euro-area level, although the eleven EMU countries have transferred national monetary sovereignty to the European level, supervisory and regulatory responsibilities have remained a national responsibility. Cooperation currently occurs mainly through bilateral arrangements and meetings in multilateral forums. In the case of banking and securities regulators, there are now bilateral Memoranda of Understanding (MoUs) between virtually all EMU (and pre-in) countries, providing for both regular meetings and cooperation, as well as information exchange, when there are specific concerns or issues. Although MoUs are typically not legally binding arrangements, cooperation with counterparts in other countries is considered to have worked well. For European banking supervision, the two chief multilateral forums are the Banking Supervision Committee (BSC), a senior-level committee for cooperation among national supervisors, and the Groupe de Contact, a lower-level group that addresses cases involving individual banks. European authorities are generally satisfied with the way EMU-wide cooperation has been occurring within these groups.

As long as banking systems remain primarily national and banks' businesses are mainly traditional (with limited reliance on both balance- and off-balance-sheet securities transactions involving cross-border exposures), the current decentralized approach that relies on cross-border cooperation will most likely remain workable and effective. As pan-European financial markets and institutions emerge, and the reliance on securitized market-oriented finance expands, pan-European financial supervision and regulation may become more desirable and necessary. European officials have acknowledged these possibilities and seem to be taking a pragmatic approach to enhancing cooperation and coordination and to developing alternative institutional arrangements. Recent developments in this area include (1) in February 1999, the signing of a multilateral European MoU among securities supervisors representing members of the Forum of European Securities Commissions (FESCO),[14] (2) discussions within the BSC about a similar broadening of existing bilateral understandings on cooperation and information sharing among banking supervisors, (3) the creation of a high-level group of representatives of EU finance ministers focusing on supervisory developments in EMU (for example, consolidated as

[14] Members of FESCO are Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, and the United Kingdom.

opposed to sectoral supervision; the appropriate relationship between the central bank and the supervisory authority; and the need for some form of European-level supervision).

There seem to be different degrees of enthusiasm among European officials about centralization, and the development of a single euro-area supervisor seems to be a long way off. By contrast, once a pan-European exchange for securities—such as the pan-European platform for blue chips that the London Stock Exchange and the Deutsche Börse are preparing—is created, the creation of a central securities supervisor and regulator will become more likely.

Crisis management. In the area of crisis management, there has been agreement within the Eurosystem on LOLR responsibilities. Should a liquidity problem occur, involving an otherwise solvent institution, the provision of emergency liquidity (or LOLR) assistance would be the responsibility and decision of the relevant NCB. Should this liquidity assistance have an impact on monetary policy, it would entail consultation with the ECB and might also require a decision by the Eurosystem about whether such liquidity assistance should be provided. In this context, emergency liquidity assistance is defined as liquidity provided to an illiquid, but not insolvent, institution for the purpose of containing systemic risk or contagion, if this is perceived to be a possibility.

This agreement clarifies the framework for crisis management within EMU. Two issues remain: (1) whether decentralized arrangements will remain appropriate when pan-European institutions and markets emerge, and (2) whether arrangements are in place—although not well defined, so as to maintain constructive ambiguity—to ensure that the Eurosystem will effectively coordinate with the eleven national supervisors, treasuries, deposit-insurance schemes, and EU authorities, in the event of a crisis involving a potentially insolvent institution.

Although a decentralized framework might be adequate to manage a crisis involving a traditional bank operating at the national level with few cross-border interbank links, it might pose challenges in the event of a crisis that has EMU-wide systemic implications. In a decentralized framework, it may be difficult to internalize entirely within national boundaries the systemic implications of a bank failure. National authorities are likely to take into account the potential costs—which would be borne at the national level—of assisting a troubled institution but not the benefits of avoiding the cross-border implications of its failure. Moreover, it is not unreasonable to expect, even in the absence of pan-European institutions, that the introduction of the euro will increase the potential for systemic events in the European banking industry. As

discussed, banks are in the process of increasing the number and size of their cross-border interbank credit lines to ensure that they can borrow from, and lend to, banks across EMU. This implies a need for more cross-border interbank lines than existed before EMU, with a correspondingly higher systemic risk in case of financial problems in one banking system. To be in a position to assess systemic risk in a timely manner, the ECB is currently developing the capability of monitoring the EMU financial system as a whole in cooperation with NCBs and national supervisors.

With regard to the modalities of coordination for resolving crises involving potentially insolvent institutions, the arrangements in EMU appear to be out of line with practices in other countries in which banking supervision has been separated from the central bank. In the United Kingdom, for example, where banking supervision is no longer the responsibility of the central bank, the recent MoU between the Bank of England, the Treasury, and the FSA, differs considerably from the arrangements in EMU. The MoU assigns an explicit responsibility for ensuring financial stability and containing the systemic implications of any crisis to the Bank of England, and it gives it unrestricted access to supervisory records. It creates a framework for decisionmaking in the event of a crisis that involves all three authorities and grants the Treasury the authority to refuse support to any institution. A similar arrangement in EMU could address the difficult question about which institutions need to participate in the management of a systemic crisis involving potentially insolvent institutions. Because any intervention would probably entail substantial costs, it would not be enough to have a monitoring system at the ECB level; it would be necessary also to have a clear understanding about the way in which the costs of the intervention could be shared at the European level. This would require considerable coordination not only among the ECB, the NCBs, and the national supervisors, but also among the national treasuries, the deposit-insurance schemes, and, probably, the EU authorities.

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