

ESSAYS IN INTERNATIONAL FINANCE

No. 151, May 1983

THE LENDER-OF-LAST-RESORT FUNCTION
IN AN INTERNATIONAL CONTEXT

JACK GUTTENTAG
AND
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INTERNATIONAL FINANCE SECTION

DEPARTMENT OF ECONOMICS

PRINCETON UNIVERSITY

Princeton, New Jersey

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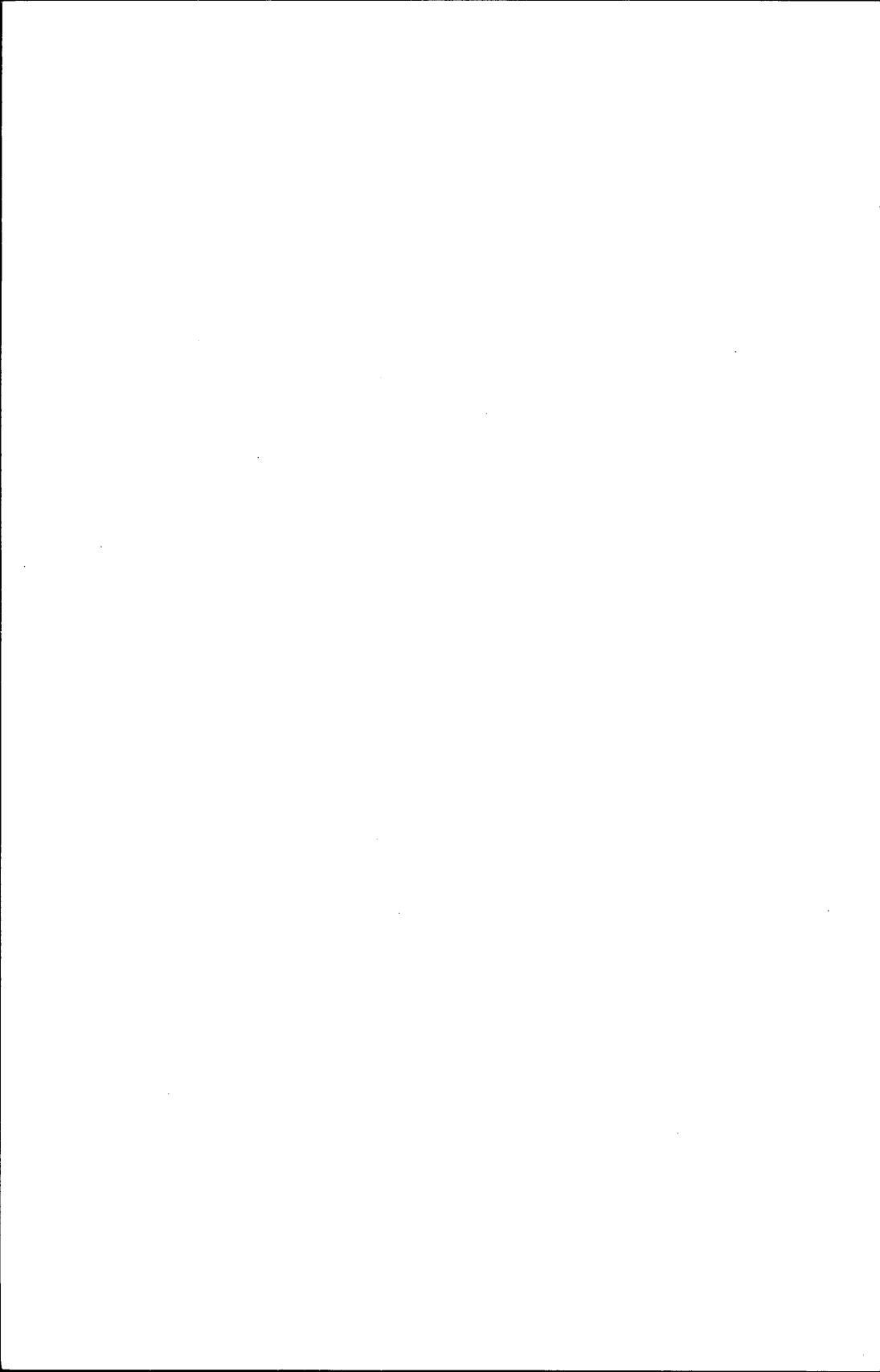
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CONTENTS

THE INCREASING VULNERABILITY OF THE BANKING SYSTEM TO INTERNATIONAL DISTURBANCES	2
RATIONALE FOR A LENDER-OF-LAST-RESORT FUNCTION	4
A. Direct vs. Indirect Support	5
B. Vulnerability of Banks to Crises	6
C. The Social Costs of Banking Crises	7
D. The Social Costs of an LLR Function	9
THE REQUIREMENTS OF AN EFFECTIVE LLR	10
INTERNATIONAL BANKING AND THE EFFECTIVENESS OF LLRS	11
DEFINING LLR RESPONSIBILITY	16
A. The Market's View	16
B. Commitments and Intentions	17
C. The Official Pronouncement	18
D. Banks That May Be without Effective LLR Facilities	20
PROPOSALS FOR DEPOSIT INSURANCE	22
CONCLUSIONS	24
REFERENCES	25



The Lender-of-Last-Resort Function in an International Context

Traditionally, discussion of the role of the lender of last resort (LLR) has focused on the national economy, without regard for international complications. To be sure, Thornton (1802) and Bagehot (1873) considered the response of international capital flows to actions taken by the LLR, but they assumed that the LLR was a national central bank that would provide funds to solvent, national institutions. Over the last two decades, the marked growth of international banking raised two key questions about the function of LLRs. First, has the growth of international banking increased the probability of a crisis that will require LLR intervention? Second, has the growth of international banking reduced the ability of national LLRs to respond effectively to incipient financial crises? The first question is addressed in other papers by the authors, which argue that banking systems have become increasingly vulnerable because of their exposure to international disturbances. The second question is the subject of this essay.

After briefly summarizing the reasons why banking systems have become increasingly vulnerable to international disturbances, we reassess the rationale for having an LLR, set forth the requirements for an effective LLR, and then consider how the growth of international banking has altered the effectiveness of national LLRs. This last issue involves problems in defining lines of LLR responsibility as well as in executing LLR functions effectively even when responsibilities are well defined. Because we are pessimistic about the prospects for establishing effective international LLR arrangements and find no merit in proposals for an international system of deposit insurance, we suggest "second best" alternatives. And because we conclude that even an effective LLR would be inadequate to cope with some crises, we try to indicate where LLR responsibilities should end and other governmental responsibilities should begin.

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The Increasing Vulnerability of the Banking System to International Disturbances

Over the past two decades, the growth of international banking activity has had a marked impact on the banking systems of most nations and has transformed international credit relationships. Between 1960 and 1980, the number of foreign branches of U.S. banks grew from 124 to nearly 800. During the 1970s, the number of foreign banks and foreign banking offices in the United States tripled from fewer than 50 foreign banks with 100 banking offices to more than 150 foreign banks with about 350 banking offices. The Eurocurrency market has mushroomed from negligible levels in 1960 to a gross size of nearly \$2 trillion. By 1980, several developing countries and the Eastern bloc had debts to private banks larger than their total obligations to governments, international organizations, and direct investors. And in several years during the 1970s, more than 50 per cent of the earnings of the ten largest U.S. banks stemmed from foreign sources.

This rapid expansion of international banking has produced significant and well-understood benefits for the world economy: it has greatly increased the efficiency with which savers in one part of the world can be connected with foreign investors; it has increased the interest elasticity of international capital flows; and it has reduced the transactions costs of international intermediation. But the growth in international banking has also caused some problems, not the least of which is that it has increased the risk of an international banking crisis.

Risk has increased for several reasons. First, international banking exposes banks to certain hazards that either do not arise in domestic operations or are much more easily controlled. These are associated with the relatively high cost of obtaining information on borrowers (including foreign banks), the greater danger of "moral hazard" as a factor increasing the likelihood of borrower default,¹ the possibility that borrowers will be unable to convert local currencies into loan-transaction currencies, the vulnerability of deposit flows to political cross-currents, the exposure to foreign-exchange uncertainties, and the relatively light regulatory controls that contribute to intensely competitive markets and allow banks to assume greater risks without challenge. Under benign financial conditions, international diversification can partly or wholly offset these risks. But if major shocks occur in a vulnerable world, international diversification will not help much when questions about bank solvency arise.

Second, the increasing burden of debt service being borne by several

¹ Moral hazard is the danger that individuals or firms in a position to shift losses or costs onto others will increase their risk exposure, act imprudently, or even commit fraud or other illegal acts.

major countries has reduced their ability to withstand disturbances to their foreign-exchange earnings or expenses. As a result, such disturbances are more likely to be transmitted to international banks.

Third, as the exposure of major banks to international shocks has increased, their ability to withstand them has declined. Capital ratios have been falling, and there has been a growing concentration of claims against specific countries. The behavior of yield spreads on syndicated country loans is consistent with the hypothesis that, except during periods of unusual stress, banks view the probability of a major shock as zero and collect no risk premiums to cover it.² Such behavior is, in turn, consistent with general findings in the natural-disaster literature regarding human behavior in the face of low-probability/high-loss hazards (see Kunreuther *et al.*, 1978, and Kunreuther and Slovic, 1978). It has historical counterparts in bank lending to sovereigns in the fourteenth to seventeenth centuries (see Gutentag and Herring, 1982b) and in the deterioration of foreign bond issues in the United States during the 1920s (see Mintz, 1951).

International banking is subject to both liquidity and solvency crises. A liquidity crisis could arise in many ways, for example from the suspension of convertibility by the governments of one or more countries in which major banks have large positions. If, say, the British government blocked convertibility of the pound sterling into U.S. dollars, a bank that had been funding sterling assets with dollar deposits might require LLR assistance if its deposits were withdrawn. A similar problem could arise if a government froze the accounts of residents of one or more foreign countries (as the United States did in 1980 with the accounts of Iranian depositors). A bank's ability to withstand a liquidity crisis depends on its liquidity position in each currency, that is, on its ability to meet cash needs in each currency in which it has obligations due.

A solvency crisis might be triggered by a development that substantially raised the expenses or reduced the revenues of one or more countries with heavy loans outstanding to banks. One such event would be a marked rise in world interest rates. Under the floating-rate loan contracts characteristic of Eurocurrency loans, banks have protected themselves against interest-rate risk by shifting this risk to borrowers. A default by these borrowers could exhaust the net worth of lending banks, lead to a loss of confidence in them, and induce a run by the creditors of those and other banks. With

² The spread over the London Interbank Offer Rate (LIBOR) may understate the return on a country loan. For example, LIBOR is generally $\frac{1}{8}$ to $\frac{1}{4}$ per cent above the rate at which banks purchase funds (the bid rate). Moreover, some banks, especially the syndicate managers, earn additional revenues by obtaining other business from the borrower or from front-end fees. The fact remains, however, that some, and probably most, banks that participate in a syndicated loan get very little compensation beyond the spread.

the rising indebtedness of major borrowers and increasing interest-rate volatility, an insolvency crisis has become increasingly likely. A bank's ability to withstand a solvency crisis depends on its capital position, that is, on its ability to absorb losses. Of course, a solvency crisis can easily set off a liquidity crisis, because even the rumor of insolvency can lead to a run, and, if not checked, the liquidity crisis could spread even more quickly than the solvency crisis that caused it.

In general, a solvency crisis is much less tractable than a liquidity crisis. An illiquid bank with a strong capital position and an effective central bank can ride out a liquidity crisis. But an insolvent bank with a strong liquidity position, while it may continue to operate for a period, will be forced to close sooner or later unless it receives a capital infusion.

Rationale for a Lender-of-Last-Resort Function

A lender of last resort is an institution with responsibility for providing credit under conditions of stress. The LLR function should be distinguished from the provision of discount or other routine credit facilities. An institution may provide discount facilities but not be an LLR if its policy is to limit to some predetermined amount the credit extended to a borrower or to withdraw credit at the first hint that the borrower is in trouble. Conversely, an LLR committed to action in an emergency might not provide any other credit facilities. Central to the LLR function is a willingness to accept a risk unacceptable to other lenders.

The classical view of the LLR function developed in the nineteenth century by Thornton and Bagehot charged the LLR with a responsibility to the entire financial system for the prevention or rapid cure of financial crises but required it to extend credit only to specific banks. The LLR was obliged to lend to all sound borrowers who turned to it as a last resort, but it was obliged to refrain from lending to unsound borrowers. Taking the classical position, we view direct lending as the crux of the LLR function, and the adequacy of facilities for making direct loans to international banks is the focus of this essay.³

Let us examine several premises underlying the classical view of the LLR function: (A) Because of capital-market imperfections, the LLR function requires direct credit extensions to individual banks. (B) Banking is peculiarly

³ Although we shall concentrate on direct loans to banks, it may sometimes be more efficient for the LLR to provide direct assistance to an illiquid but solvent nonbank borrower than to assist the banks that would be impaired by the borrower's failure to make timely debt-service payments. This is especially likely when the nonbank borrower is very large and there are many lending banks with heavy exposures. The loans from the Bank for International Settlements to Hungary and Mexico in 1982 may be such instances.

subject to crises. (C) The social costs associated with bank failures during a financial crisis are larger than the private costs. (D) Banking crises are preventable by an LLR at relatively small social cost.

A. Direct vs. Indirect Support

Some contemporary analysts take the view that direct LLR lending is not an essential function of a central bank. Humphrey (1975) argues that Bagehot would have taken this position if open-market operations had been available to the Bank of England in the nineteenth century.

It is true that if capital markets were "perfect" in the sense that all participants had perfect foresight, no LLR function would be needed. If banks were solvent, they could borrow at the same rate as the government; if they were insolvent, they could not borrow at all. The central bank could use open-market operations to achieve the desired degree of stringency in the market without worrying about whether individual solvent institutions could obtain the credit they needed to meet their liabilities.

Granted that credit markets can never be perfect in this sense, they might still be competitive and "efficient" if no market power existed and information on borrowers was rapidly disseminated. Creditors of banks would always react to the possibility of bank insolvency by demanding an appropriate default premium, and the case for a direct-lending LLR function would be weakened. (It would be limited to avoiding the social costs associated with the failure of banks to which private lenders would not consider lending at a premium that those banks could afford to pay.) However, this is not the way credit markets work. Because information regarding bank solvency is hard to obtain and often dated, and because of the moral hazard faced by creditors of banks whose solvency is in doubt, solvent banks may at times be unable to borrow in private markets.

If a bank in this situation offers higher interest rates to its depositors, it may make its problem worse. When a bank comes under suspicion and information about it is unreliable, its offer to pay a higher interest rate is interpreted by the market as confirmation of its weakness. This was, indeed, the crux of Bagehot's case for an LLR. As he pointed out, "Every banker knows that if he has to *prove* that he is worthy of credit, however good may be his arguments, in fact his credit is gone . . ." (1873, p. 68; for an extended analysis of this point, see Guttentag and Herring, 1982a).

An LLR may have better information than the private markets about the condition of a bank and may know that the bank is solvent when the private market does not. Moreover, the LLR may be in a better position than the private markets to impose conditions on a borrowing bank in order to assure its continued solvency. These conditions, backed by sanctions, include requiring the bank to provide information and requiring or prohibiting certain

behavior. Finally, to avoid the social costs incurred by some bank failures, the LLR may be willing to take risks that a private lender will not.⁴

While financial markets are imperfect, so are LLRs, especially when they must deal with international banks. To some extent, LLRs and lending by financial markets are alternative means for preventing the failure of solvent banks. Which means is likely to be most effective depends on a wide range of circumstances. Domestically, most societies have decided that an LLR is more effective, but the same conclusion may not hold in the international arena. And if it does not hold, efforts to improve the efficiency of markets may well provide a larger payoff than efforts to improve the efficiency of LLRs.

B. Vulnerability of Banks to Crises

Banking is subject to crises for two reasons. First, banks must maintain the inherently fragile confidence of their creditors. Perceptions about the soundness of banks are subject to great uncertainty; they are heavily influenced by assessments of the quality of the banks' loans and securities, on which timely information is often difficult or impossible to obtain. Furthermore, banks are very highly leveraged; there is always the possibility that a major unanticipated shock will wipe out their capital. Since a large proportion of bank liabilities is very short term, creditors have the opportunity to run when they suspect the possibility of such a shock.

Second, banking is subject to contagion. In a fractional-reserve banking system, a "run" on one bank reduces the total reserves available to other banks, and the entire system is weakened if these reserves are not replaced.⁵ Banks typically lend heavily to each other, moreover, so that shocks may spread throughout the system. In both the foreign-exchange market and the Eurocurrency market, liabilities to banks are much larger than liabilities to nonbanks. A weakening of creditor confidence in one bank may easily lead to suspicions about others.

Vulnerability to financial crises can be reduced or eliminated by a comprehensive system of deposit insurance or by 100 per cent reserve require-

⁴ Under the best of circumstances, a judgment of solvency is a probabilistic assertion: "If the bank is allowed to borrow freely from the LLR, it has an x per cent chance for survival." What chance for survival should be considered sufficient to qualify the bank for aid? No general answer to this question is possible. The higher the threshold is set, the higher the probability that some solvent banks will be denied aid, but the lower the probability that resources will be wasted on insolvent banks.

⁵ This danger no longer exists in domestic systems like that of the United States, where reserve effects of currency drains are automatically neutralized by open-market operations, but the other factors continue to be a problem.

ments.⁶ In Eurocurrency markets, however, deposit insurance is unworkable, as we shall see, while 100 per cent reserve requirements are impossible.

C. The Social Costs of Banking Crises

To assess the social costs of banking crises, we distinguish between those that can be prevented by general support to the banking system through open-market operations or changes in reserve requirements and those that can be prevented only by direct lending to individual banks.

The most obvious and important costs of a banking crisis arise from the deflationary consequences—unemployment, income declines, and losses in capital values—that come when a portion of the public's liquid wealth is wiped out. If the central bank has adequate tools, it can prevent or offset these deflationary effects through its general monetary powers (as the government can, using fiscal tools) without direct lending to individual banks. Unfortunately, a central bank's general tools may not be adequate. In Bagehot's world, the Bank of England relied on direct lending to implement general monetary objectives, and this still remains true for many central banks, including some in advanced industrial nations.

Even if a central bank is able to provide general support to the banking system, it may be unable to avoid a second category of costs, those associated with failures of individual solvent banks. These costs can usually be prevented only by direct lending to those banks. The failure of an insolvent bank may lead directly to the failure of a solvent one—the contagion problem referred to earlier. The failure of a solvent bank involves the needless loss of the bank's value as a going concern ("going-concern value"), including the loss of customer relationships that have accumulated over the years. Furthermore, solvent banks that fail are likely to be small and to have customer relationships with small borrowers, which raises issues of income distribution and equity among both banks and individuals. Such failures may also have unfavorable impacts on market structure if the number of banks in the market is already small.

Historically and institutionally, LLRs do not deal with problems associated with insolvent banks, although these could be dealt with by a central bank wearing a different hat. Any extended discussion of these problems exceeds the scope of this essay, but their general nature must be defined so that we understand what an LLR is not fitted to do. (For a more extensive analysis, see Guttentag and Herring, 1982c.)

⁶ In his widely read Fordham lectures delivered in 1959, Milton Friedman argued that deposit insurance in the United States had made our banking system panic proof, although he would have preferred 100 per cent reserves (Friedman, 1960). This observation seems much less secure today because of the rapid growth of uninsured liabilities at U.S. banks and of uninsured money-market funds.

Two important problems are specifically associated with insolvent banks. The first is how to protect creditors and prevent the dissipation of the insolvent bank's assets at their expense. If an institution is insolvent, new creditors not aware of the bank's condition will share the losses of its old creditors when the institution is eventually liquidated. More important, both new and old creditors are subject to the risk that any delay in closing the bank will *increase* their losses.⁷ This reflects the moral hazard that the bank's managers will take on riskier loans (or interest-rate or foreign-exchange positions) in an attempt to benefit the shareholders at the potential expense of the bank's creditors (or insurers or LLR). When a bank's capital has been depleted, the management has an incentive to engage in high-risk/high-return ("go for broke") ventures in which any gains will benefit management and stockholders while losses will be borne entirely by creditors.⁸ Incentives also increase for "self-dealing" transactions and fraud.

Closing a financial institution thus avoids the risk that losses are very likely to accelerate once capital is depleted. Closing an insolvent bank is usually the legal responsibility of the political entity that chartered it, although the LLR may "pull the plug" by refusing to make additional loans, or, if the bank's deposits are insured, the insuring agency may do the same by terminating insurance. Formal or informal linkages among the chartering agency, the insuring agency (if any), and the LLR usually ensure the coordination of such actions.

The second problem connected with an insolvent bank is how to minimize the loss of going-concern value that would result from an outright liquidation. Banks usually are worth much more alive than dead even when their worth alive is negative.

The two problems can be illustrated by the following hypothetical example. A bank has assets and liabilities with market values of \$70 and \$100, respectively, or an immediate liquidation value of -\$30. This would be the loss to creditors if the bank were closed immediately. If the bank continued

⁷ In most European countries, depositors who can demonstrate to the courts that a bank was insolvent when they made a deposit have a prior claim on the bank's assets over old creditors.

⁸ For example, a bank with loans outstanding to a country on the verge of default that are equal to its capital might make an additional bail-out loan of the same amount that carries only a 10 per cent chance of full recovery. Ignoring interest, the expected social benefit of the additional loan would be $0.20L$ (10 per cent times the value of both the old and new loan) exclusive of any externalities involved in keeping the bank alive, and the expected loss from the bail-out loan would be $0.90L$. Even if externalities are important enough to outweigh this disparity, should the new loan go the way of the old one, the bank might make still another loan on which the expected loss was larger. So long as the bank continues to operate, there is no limit on the losses it can impose on its creditors. For a more general treatment of this phenomenon, see Guttentag and Herring (1982b).

to operate and the bank's managers pursued a go-for-broke strategy, losses could mount to a maximum of -\$100 without attracting any additional liabilities. If the bank were closed immediately and sold to another bank under competitive bidding, the loss might be reduced to -\$10, the \$20 that was paid above liquidation value being the bank's going-concern value.

An insolvent bank's going-concern value can be captured by keeping the bank operating with financial assistance (and probably new management) or by merging it with another bank. This is a natural function of a deposit-insuring agency because the agency minimizes its own losses by saving the insolvent bank's going-concern value. If there is no deposit-insuring agency to perform this function, it must be performed *ad hoc* by some other official agency. If a bank's insolvency is due to losses on loans to a limited category of borrowers, the insolvency could be cured by providing assistance to the borrowers so that they can repay their loans. None of these tasks is within the traditional purview of a central bank.

D. The Social Costs of an LLR Function

There are three costs of offering an LLR function. First, there is the direct cost of the loan procedures that must be administered by the LLR. This cost is very small. Second, there may be substantial indirect costs to the extent that the availability of LLR facilities leads some banks to assume riskier positions than are socially optimal and thereby makes the whole banking system more vulnerable.⁹ The extent to which this moral hazard becomes a real problem depends partly on the ability of central banks and other agencies to prevent it through regulatory sanctions. Third, if general monetary powers are inadequate, direct assistance to a troubled bank may cause the authorities to diverge from their macroeconomic objectives.

An inadequate LLR involves another serious cost. An LLR that will not be able to deliver assistance in a time of real stress seriously weakens the banking system by discouraging the development of private relationships that could, even if imperfectly, perform that function. The worst of all possible worlds would be an LLR arrangement which encouraged banks to believe that it would be available when needed, which could not constrain the tendency of banks to overexpose themselves on the basis of faith in the LLR, and which then, when a crisis occurred, could not meet its obligations. It would be far better for the central bank to declare that for specified banks or under specified circumstances there will be no LLR and to use its powers and influence to provide the market with as wide a range of timely and relevant information as possible.

⁹ If markets are not competitive, LLR assistance to solvent banks may also involve an efficiency cost. This is a good reason for central banks to be concerned with market structure.

The Requirements of an Effective LLR

What are the desired characteristics for an institution that acts as an LLR? First, if the LLR is to take timely and effective action in a crisis, it should be sensitive to the full range of social costs that may result from its inaction.

Second, since the role of the LLR is to immunize sound banks from a shock that causes some unsound banks to fail, the LLR should have resources which, if not unlimited, are well in excess of the largest needs that it is likely to face in a crisis. If the LLR's resources are inadequate, it may not be able to sustain the confidence of creditors of sound institutions.

Third, the LLR must be able to limit the moral hazard its existence tends to create. An LLR creates two types of moral hazard. It was noted earlier that an LLR reduces the cost of risk-taking and therefore may lead the banking system to assume greater risks than are socially optimal. Thornton, writing in 1802, warned that it would not "become the Bank of England to relieve every distress which the rashness of country banks may bring upon them; the bank, by doing this, might encourage their improvidence" (p. 188). The other type of moral hazard is presented by a bank whose net worth has become zero or negative so that it has an incentive to misrepresent its current condition in order to obtain LLR assistance. Once assistance has been given, the bank has an incentive to play go-for-broke by booking riskier loans or taking larger trading and investment positions. Let us say the bank has large loans outstanding to a single borrower who will fail unless even more credit is made available and may well fail even with additional loans. The bank may go ahead and take the risk of extending more credit. Bagehot (1873, pp. 230-232) noted that the role of bank capital is "not to work the business but to *guarantee* the business. . . . The capital is wanted to assure the public and to induce it to trust the concern." Bank capital is "only wanted as a 'moral influence' . . ."

The first type of moral hazard is controllable only through continuing and effective supervision, which must include (1) the power to obtain accurate and timely information (whether through on-site examinations or other means) and (2) the power to impose effective sanctions. Sanctions may include administrative actions such as issuing "cease and desist" orders, prohibiting the payment of dividends, replacing the bank's management, or revoking the bank's charter. They could also include monetary penalties in the form of fines, higher interest rates on LLR advances, higher deposit-insurance premiums, etc.

One other possible way to avoid this type of moral hazard is to make access to LLR facilities uncertain, something to be determined *ad hoc* in each crisis. This is indeed likely to make banks more risk averse, but it will also make their creditors more prone to abrupt reassessments of the banks'

creditworthiness, thereby weakening the system. A policy of ambiguity is thus antithetical to the primary function of an LLR. It also provides an inequitable advantage to large banks and their customers, as we shall see.

To deal with the second type of moral hazard—preventing banks whose net worth has been eroded from adopting go-for-broke strategies—the LLR again depends on effective supervision. As a matter of policy, the LLR will lend only to solvent banks. But solvency determinations require the type of detailed information that can be obtained only through the supervisory process. Furthermore, the LLR is concerned not just with the status of the bank at the time it advances credit but also with what the bank does afterward. In marginal cases where the LLR grants the bank the benefit of the doubt on the issue of solvency, the LLR may feel it necessary to tighten supervision, perhaps to impose special restrictions on the bank, increase the frequency of examinations or statistical reports on operations, and so on. It is not necessary that the LLR be the supervisory agency. Indeed, since the same type of moral hazard would arise from governmental deposit insurance, an insuring agency might with equal logic be the one entrusted with responsibility for preventing excessive risk-taking. But if another agency is the supervisor, the LLR must have full confidence in that agency and there must be complete cooperation in both directions.

Central-bank LLRs traditionally protect themselves by demanding collateral. However, an insolvent bank with some acceptable collateral that obtains an LLR loan can still adopt a go-for-broke strategy. While the LLR may be protected, the bank's other creditors (and society) are not. Conversely, a solvent bank with very large immediate needs might have trouble providing enough collateral that is acceptable to the LLR and might fail unnecessarily. If the LLR, through its supervisory powers or those of another trusted agency, is already aware of the quality of the bank's assets and can control the bank's behavior, it has little need for collateral. Lending against collateral shifts the risk to other creditors who are less able to protect themselves, and it might encourage the LLR to be careless in evaluating the bank.

International Banking and the Effectiveness of LLRs

We have seen that an effective LLR must be sensitive to the full range of social costs associated with its actions or inactions, must have adequate resources, and must be able to evaluate the solvency and limit the risk exposure of the financial institutions to which it may lend. Even if an LLR meets all three criteria when the financial system is closed to foreign transactions, it may become less effective as international banking transactions increase.

When domestic banks have many foreign creditors and debtors, the LLR will not necessarily be responsive to the full range of social costs that may result from a banking crisis. Consider, for example, a subsidiary of a French bank, incorporated in the United Kingdom, and dealing primarily in U.S. dollars, which obtains deposits largely from residents of the Middle East, and uses its funds to finance trade between Italy and Brazil. The LLR for this bank could be the central bank in the jurisdiction where the owners reside (France), in the residential jurisdiction (United Kingdom), or in the currency jurisdiction (United States). (Frankel, 1975, has drawn a similar distinction.) Whichever jurisdiction the LLR is in, it is unlikely to be fully sensitive to the interests of foreign creditors or borrowers. Yet the primary impact of the failure of this bank would be felt by its depositors from the Middle East and its borrowers from Italy and Brazil.

While this example is extreme, most large banks have substantial relationships with scores of countries. Obviously, the ideal LLR for an international bank would be an institution that represents the world community. It is equally obvious that such an institution will be a long time coming. Cooperation and consultation among national LLRs may compensate to some extent for the lack of an appropriate international institution, but such arrangements are cumbersome to negotiate and may be unreliable in a crisis.

An LLR that follows the traditional rule of lending freely to solvent banks assumes that the banks in turn will lend freely to their own customers, with whom they may have long-standing relationships. If the banks cut off solvent domestic borrowers, the LLR may be able to prevail upon them to meet their responsibilities and, failing that, might even lend its own funds to the customers affected. In Eurocurrency markets, however, customer relationships are less prevalent. This has the advantage that markets do not stay in disequilibrium very long, but it has the disadvantage that, in a crisis, solvent borrowers are more likely to be cut off. An LLR is not likely to help foreign borrowers unless important foreign-policy issues are raised, nor would the LLR be likely to have the information needed to assess the borrowers' solvency.

At first glance, the question of resources appears more tractable. So long as currency convertibility is maintained, at fixed or floating exchange rates, a bank that has access to one convertible currency should be able to buy any currency needed to settle debts when due. If, for example, a bank headquartered in France experiences a run on its dollar-denominated deposit liabilities and exhausts its convertible currencies, it can turn to the Bank of France and borrow French francs, which it can sell for dollars on the foreign-exchange market. If the amount of dollars the troubled bank requires is small relative to French official foreign-exchange reserves, no

problem arises. But if the amount of dollars is relatively large, the Bank of France faces an uncomfortable policy decision that would not have arisen if the troubled bank had issued liabilities denominated in French francs.¹⁰ As francs borrowed by the bank needing dollars will be sold on the exchange market, the franc will depreciate. If the Bank of France wants to resist the depreciation of the franc, it must buy back the francs on the exchange market, drawing down its foreign-exchange reserves.¹¹ To augment its reserves, it may have to borrow from international monetary institutions, other central banks, or the private market. Since there is some limit to the amount of foreign exchange it can acquire on acceptable terms, fulfillment of LLR responsibilities may come into conflict with the goal of maintaining exchange-rate stability. The fact that in times of heightened uncertainty banks headquartered in countries with very large dollar reserves can attract Eurodollar deposits on more favorable terms than banks headquartered in countries with relatively small reserves may indicate that market participants are troubled by this possibility.

By far the most serious problem facing a national LLR is the exercise of regulatory control and surveillance over an international bank. In order to limit the social costs of its actions, the LLR must have direct regulatory control over the institutions to which it is willing to provide assistance or must be sure that such controls are exercised by an agency in which it has great confidence and with which it shares information. Otherwise, the LLR cannot readily control the likelihood that, or extent to which, an institution will require LLR assistance, nor can it readily determine at any juncture that the institution is "sound" and therefore eligible for aid.

Most international banking activity has been located in the gaps between national regulatory systems in order to take advantage of asymmetries in banking regulations applying to domestic- and foreign-currency transactions and domestic and foreign residents. Most countries regulate the domestic-currency activities of resident banks more strictly than their foreign-currency activities, and this is a major incentive for undertaking Eurocurrency transactions.¹² Since many countries regulate bank transactions with do-

¹⁰ Of course, an equivalent situation could arise if the reason for the run were speculation against the franc rather than concerns about the solvency or liquidity of the bank. In that case, domestic and foreign depositors would be redeeming their franc-denominated deposits in order to buy foreign currency.

¹¹ Letting the exchange rate float is a way around this difficulty only if policy-makers are indifferent to the foreign-exchange value of domestic currency. In most countries, a policy of indifference to the exchange rate is politically impossible.

¹² In countries like the United States and Germany, where foreign-currency transactions are generally subject to the same regulations as domestic-currency transactions, there is relatively little Eurocurrency activity. Recently the United States has attempted to attract a share

mestic residents more strictly than transactions with foreigners, creditors and debtors of Eurobanks tend to reside in a different country from the Eurobank. Since most countries supervise the foreign offices of their own banks less strictly than their domestic offices, Eurobanks located in one country are often branches, subsidiaries, or affiliates of banks headquartered in another country. And since nations vary with respect to the regulations and taxes they impose on foreign-owned banks—often with the explicit aim of attracting banking activity—Eurobanks tend to be concentrated in those nations where such burdens are relatively light. Thus, although a Eurobank is potentially subject to regulation by the authority where the parent bank is chartered, by the authority where the Eurobank resides, and by the authority in whose currency it deals, it will usually be located so as to minimize all regulatory restrictions.

The problem is further complicated by the fact that the entities conducting international banking operations assume legal forms that differ with respect to whether, how, or by whom they are regulated. In general, a branch in country B of a bank chartered in country A is regulated by the authorities in A, although it may also be subject to rules imposed by the authorities in B. A subsidiary chartered in B that is owned by a bank chartered in A is subject to regulation by the authorities in B, although the authorities in A may require approval of the acquisition and also may impose some operating constraints. A joint venture chartered in B that is owned by several banks in different chartering jurisdictions is subject to regulation by the authorities in B and is less likely than a wholly owned affiliate to be regulated by the authorities in the countries where the shareholding banks are chartered, particularly if a shareholding bank owns only a minority interest.

The requirement that an LLR exercise regulatory control over the banks to which it lends suggests (1) that the LLR for foreign branches should be the one in the country where the branch's parent is chartered and (2) that the LLR for affiliates and joint ventures should be the one in the country of residence. The first rule is roughly workable, although it is hampered by logistical difficulties in regulating and monitoring the activities of foreign branches and in some cases by legal barriers imposed by the country where the branch resides. Countries with bank-secrecy laws, such as Switzerland, Lichtenstein, and the Bahamas, pose especially difficult problems. Furthermore, delicate issues of national sovereignty frequently arise when one sovereign exercises functions on the soil of another. The second rule is not

of Eurocurrency activity by authorizing international banking facilities that exempt certain categories of transactions with foreign residents from domestic-reserve requirements and interest-rate ceilings.

workable at all: in some countries of residence foreign-owned corporations are not regulated; in some there is no LLR; and in some the national LLR refuses to accept responsibility for such entities.

It is conceivable that the problem of inadequate supervision and regulatory control could be surmounted by international cooperation and coordination among national LLRs. The Standing Committee on Banking Regulations and Supervisory Practices, composed of representatives from the Group of 10 plus Switzerland and Luxembourg, was established in 1974 by the Governors of the Group of 10. In 1975, the Committee agreed on a demarcation of responsibilities among national supervisory authorities, the "Concordat." With regard to the supervision of liquidity, the Committee "concluded that responsibility for . . . foreign branches must rest in the first instance with the host supervisory authority . . ." (Blunden, 1977, p. 328). The host country was also given prime responsibility for supervising the liquidity of locally incorporated banks. With regard to solvency, the host supervisory authority was given primary authority for supervising foreign subsidiaries and joint ventures, and the parent authorities were given primary responsibility for the solvency of foreign branches. This division of responsibility is similar to the one we described (and criticized) above; we note below, however, that it does not correspond to the division of LLR responsibilities reported to have been agreed upon by the central bankers. The Bank of England has sought to clarify, at least partially, the responsibilities of parent institutions for their offspring by soliciting "comfort letters," written acknowledgments from shareholders in consortium banks and from the overseas parents of banking subsidiaries that "they accepted a moral responsibility for their offspring in London that went beyond the narrow limits laid down by laws of limited liability" (McMahon, 1977, p. 109).

The concrete operational measures required to implement the Concordat, such as the sharing of information, are still evolving. The prospects for this venture can be gauged by the many decades it has taken to coordinate (partially) the actions of the three Federal regulatory agencies in the United States. It was not until 1979, under intense pressure from Congress, that the agencies adopted a common set of criteria for appraising the soundness of banks. How much greater must be the difficulties when the regulatory authorities involved operate within diverse legal frameworks and traditions and where there is no higher authority pushing them for results.

It thus seems clear that national LLRs are inherently ill-suited to provide LLR assistance to international banks. Since they represent national interests, there is no assurance that in a crisis they will take a cosmopolitan view of their responsibilities. During a period of stress, national LLRs are not in a position to persuade or compel banks to act responsibly toward Eurocurrency borrowers, and only if important foreign-policy interests are involved

are they themselves likely to assist such borrowers. Furthermore, the need to use foreign-exchange resources may reduce an LLR's willingness to aid an otherwise sound bank. But most important, jurisdictional tangles and gaps in regulatory control sometimes make it difficult, if not impossible, to tie LLR responsibility to regulatory and supervisory control. (The tactic of discounting at a penalty rate may also face difficulties, because an LLR may be unable to take possession of collateral held in foreign offices of the troubled bank.) We must thus conclude that the growth of international banking has made it more difficult for national LLRs to cope with a financial crisis.

Defining LLR Responsibility

In this section we consider (A) the market's expectations regarding probable access to LLR facilities in a crisis, (B) whether some ambiguity regarding lines of LLR responsibility in Eurocurrency markets may be desirable, (C) the "official" view of major central banks on LLR responsibilities, and (D) the categories of banks that might find themselves without an LLR in a crisis.

A. The Market's View

Market expectations regarding the provision of LLR facilities in the Eurocurrency markets can be inferred from interest-rate relationships during periods of uncertainty. Branches of a given parent bank can usually attract deposits at interest rates lower than or equal to rates offered by any of the parent's wholly owned subsidiaries, which in turn can attract deposits at rates lower than or equal to rates offered by any of the parent's joint ventures. This pattern is consistent with the hypothesis that the branch is most likely to get help in a crisis.

Deposit rates do not vary greatly from center to center. For example, deposit rates for Eurobanks residing in London are not substantially lower than deposit rates for Eurobanks residing in tax havens such as Nassau or the Cayman Islands. This pattern seems to suggest that the market does not expect LLR facilities to be provided by authorities in the residential jurisdictions.

During periods of market strain, deposit rates at Eurobanks chartered in countries having balance-of-payments difficulties (e.g. Portugal, Italy, and Japan in 1974, France in 1982) tend to be higher than rates at other Eurobanks. This pattern of "tiering" by country of the parent bank is consistent with the hypothesis that LLR facilities will be provided by the central bank of the country where the parent bank is chartered.¹³

¹³ Information on tiering in the interbank market is fragmentary at best. It is known that extensive tiering developed following the failure of the Bankhaus I.D. Herstatt on June 26,

Finally, among Eurobanks in any single chartering jurisdiction, the largest banks attract deposits on the most favorable terms, seemingly without regard for capital ratios or other aspects of risk. This is consistent with the hypothesis that the largest banks in any jurisdiction are the most likely to have access to LLR facilities.

B. Commitments and Intentions

What sort of commitment should an LLR offer in advance of trouble? Broadly, there are three possible policies:

1. The LLR explicitly promises to do what it is in fact able and prepared to do and makes clear what it is not prepared to do.
2. The LLR promises less than it is able and prepared to do.
3. The LLR promises more than it is able and prepared to do.

Legitimate questions can be raised regarding the relative merits of policies 1 and 2. These are discussed below. Policy 3 can be disposed of more quickly because it is a prescription for disaster (although it offers strong temptations to policy-makers to try for a "free ride"). If an LLR promises more than it is prepared to deliver and the market comes to rely on these promises, private arrangements and resources designed to cope with adversity are likely to be reduced and any emerging crisis is bound to be worse.

The classical view of the LLR function, as enunciated by Bagehot, is that the LLR's commitment should be clearly and explicitly laid out in advance (policy 1). But there is a cost to this policy, namely, the moral hazard that banks will take larger risks if they know that the LLR will bail them out in the event of trouble. In the Bagehot scheme, this hazard was limited because the LLR was expected to confine itself to collateral lending to solvent banks at high rates of interest. But, as we have seen, collateral lending by an LLR has serious shortcomings.

Because of concerns about moral hazard, Henry Wallich, the member of the Federal Reserve Board most closely involved with international banking problems, would not apply the classical view to international banking. His argument appears to favor policy 2: "There are dangers in trying to define and publicize specific rules for emergency assistance to troubled banks, notably the possibility of causing undue reliance on such facilities and possible relaxation of needed caution on the part of all market participants" (1977, p. 95). The other side of the coin, however, is that depositors who are unsure about their bank's access to an LLR are encouraged to run at

1974. While Herstatt was a relatively small German bank, its failure severely jarred the market (see Bachman, 1976). For a report on tiering in response to the Mexican debt crisis, see Anderson and Field (1982).

the first hint of trouble. Furthermore, uncertainty is not an effective constraint on the very largest banks, where the problem of moral hazard is potentially most serious. In a system with no LLR, bank creditors have a strong incentive to monitor the risk exposure of every bank. In a system with an uncertain LLR, creditors are apt to make judgments regarding the probability that various banks will have access to the LLR. Those banks believed most likely to have access will be monitored less intensively. We have already noted that the market assumes that large banks are more likely to get assistance than small banks. (Indeed, Giddy and Dean, 1980, p. 62, have argued that all deposits in major banks headquartered in Group of 10 countries are effectively insured, since it is unlikely that a Group of 10 central bank would let one of its major banks fail.) Ambiguity regarding access to an LLR thus provides an important and wholly unjustified advantage to large banks.

In addition, ambiguity may lead to false confidence, a point illustrated by the remark of a surprised banker in Luxembourg in the wake of the default of the Luxembourg holding company controlled by the Italian Banco Ambrosiano. Arguing for intervention by the Bank of Italy, the banker asserted: "According to the Concordat, a central bank is responsible for the activities of its national banks abroad" (*Wall Street Journal*, Sept. 1, 1982). Of course, this assertion was wrong in several respects: the Concordat relates to supervisory responsibilities, not lender-of-last-resort responsibilities; the entity in question was not solvent and therefore not eligible for LLR assistance; and, in any event, the entity was not a recognized bank. Nevertheless, the remark does point up the danger of saying too little about what the LLR is *not* likely to do.

It is unclear whether, in an international context, the social costs associated with policy 1 or policy 2 are greater, but we are confident that it is preferable for the authorities to acknowledge that there are no LLR facilities for some categories of institutions than to pursue policy 3.

C. The Official Pronouncement

We turn next to the policy that is actually being followed. There is a calculated vagueness surrounding official arrangements to deal with an international banking crisis. The official communiqué, issued in September 1974 by central bankers from the major industrial nations meeting at the Bank for International Settlements in Basel, states only:

The Governors . . . had an exchange of views on the problem of the lender of last resort in the Euro-markets. They recognized that it would not be practical to lay down in advance detailed rules and procedures for the provision of temporary liquidity. But they were satisfied that means are available for that purpose and will be used if and when necessary (Wallich, 1977, p. 95).

Precisely what "means" satisfied the Governors is not a matter of public record. There have been reports, however, of a very detailed agreement on division of responsibility. The editors of *Euromoney* (1974), for example, reported that there was agreement that foreign branches and affiliates are the responsibility of parent banks, supported by the central bank of the parent, if necessary, while consortium banks should be supported on a pro rata basis by their parents (again with central-bank support, if necessary). Whether or not this account is accurate, it is certainly consistent with the principles that the Bank of England has sought to advance in soliciting comfort letters.

Still, not all the evidence supports this account of an agreement on the sharing of responsibility. There have been reports of sharp disagreements between home and host countries regarding responsibilities for subsidiaries and joint ventures. And there were technical problems, because at the time of the agreement neither West Germany nor Luxembourg had an official LLR.¹⁴ Furthermore, the U.S. Federal Reserve Board has announced that it does not consider moral commitments made by U.S. banks to the Bank of England to be binding on the Federal Reserve (Spero, 1980, p. 157).

Indeed, under the provisions of the Depository Institutions Deregulation and Control Act of 1980, the Federal Reserve will play a very different role from the one outlined in the alleged Basel agreement or from one adopted by the Bank of England. Under the Act, "Any depository institution holding reservable transaction accounts or nonpersonal time deposits is entitled to the same discount and borrowing privileges as member banks" (Board of Governors of the Federal Reserve System, 1980). This provision holds regardless of whether the institution is owned by U.S. or foreign residents and regardless of whether it is a branch or affiliate of a foreign institution.¹⁵ While some Federal Reserve officials have told us that they interpret the Act to mean that foreign institutions are to have access only to "routine" discounting, not to LLR facilities, others have told us that this distinction, even if it was intended by Congress, may be difficult to draw in practice.

Another indication that the doctrine of parental responsibility is not universally accepted is the extended dispute that followed the collapse of the Israel-British Bank, which was an Israeli bank's subsidiary incorporated in

¹⁴ The Bundesbank made loans to banks under credit lines in order to control domestic liquidity, but these credit lines were not readily expandable in times of stress.

¹⁵ The doctrine of parental responsibility also seems inconsistent with the reporting system on country-risk exposure that was recently adopted by the U.S. authorities. Under this system, interbank claims on a branch abroad are shifted to the country in which the head office of the branch is located, while claims on subsidiary banks are not shifted unless the parent has formally guaranteed or collateralized the loan (see Federal Reserve Bank of New York, 1978).

the United Kingdom. The Bank of England insisted that it had no responsibility as LLR for a foreign-owned bank, while the Israeli banking authorities argued that they had no responsibility for a British corporation. Only after more than a year of negotiations and, reportedly, pressure from the United States on the Israeli banking authorities, was there an agreement to pool the assets of the parent bank and the British subsidiary. The Bank of England contributed £3 million to the pool of assets, in a gesture that it insisted was not a precedent (Spero, 1980, p. 157).

Thus it is not clear how one should interpret the vague official pronouncement regarding LLR facilities. It is possible that officials have actually agreed to a comprehensive set of arrangements and a precise division of LLR responsibilities, in which case their vague public pronouncement should be interpreted as an attempt to minimize moral hazard. But it is at least equally possible that officials have agreed only on the need to allay public concern over international LLR arrangements and have failed to achieve agreement on a precise division of LLR responsibilities. In this case, the deliberate vagueness of the public pronouncement simply reflects the lack of precision in LLR arrangements. The second interpretation acquires credence from the fact that the official pronouncement on LLR responsibilities was made during a period of market turmoil following the Herstatt affair. It is also supported by some off-the-record discussions we have had with policy-makers who were directly involved. If this interpretation is correct, it would hardly be the first time that, in order to ease the anxieties of the public, officials achieved an apparently unified public posture by issuing a deliberately vague statement.

D. Banks That May Be without Effective LLR Facilities

We are concerned that at present several categories of banks that conduct a substantial volume of international transactions have, at best, uncertain access to an LLR. Banks headquartered in countries with inadequate LLR facilities, or none at all, are likely to encounter serious difficulties in the event of a financial crisis. This applies as well to their foreign branches and affiliates, for whom the doctrine of parental responsibility is meaningless. So far as we know, the United States is the only nation that might make LLR facilities available to resident financial institutions without regard to country of ownership, and that is far from certain. The reluctance of the Federal Reserve to acknowledge such a responsibility is understandable in view of the difficulties it could face in dealing with the U.S. branch of a foreign bank about which it could not obtain reliable supervisory information.

We are also concerned about banks located in countries that have adequate LLR facilities for banking activities denominated in domestic curren-

cies but inadequate facilities for coping with foreign-currency difficulties. This category includes banks headquartered in countries with inconvertible currencies, but to an extent it may also include banks headquartered in countries with convertible currencies but relatively meager foreign-exchange reserves.

Finally, there are foreign affiliates that, in the event of a crisis, may not have access to the LLR facilities of their parent banks. The comfort letters sought by the Bank of England to fortify the doctrine of parental responsibility pointed up the problem but did not solve it, because the letters are not binding commitments on either the parent or its LLR. In practice, a parent's LLR might well withhold assistance if (1) the affiliate is a joint venture or consortium in which the parent has only a minority interest, (2) accurate and timely information on the status of the affiliate is unavailable, (3) the amounts needed by the affiliate are substantial relative to the capital of the parent, so that assistance rendered the affiliate might significantly weaken the parent, or (4) the LLR does not accept the doctrine of parental responsibility or accepts it subject to conditions and qualifications.

Regarding the last point, LLR facilities in Belgium are provided under a "deposit-protection scheme" funded by the banks themselves and administered, not by the central bank, but by the Institute for Rediscount and Guaranty, a quasi-public institution whose routine functions are similar to those of discount houses in the United Kingdom. Probably because it is bank-funded, the system is designed to protect Belgian banks only and would not be used to aid the foreign affiliate of a Belgian bank unless the parent bank itself was in trouble. This type of constrained LLR facility would have the effect of dampening the willingness of a parent bank to assume responsibility for its affiliate in time of trouble.

How large a volume of deposits is covered by these categories? Unfortunately, it is not possible to give a precise answer or to gauge the indebtedness of the relatively vulnerable banks to other banks that have clearer access to an effective LLR. We do not even know how many countries lack an effective LLR, but, even within the European Economic Community, Luxembourg has no LLR and Belgium has only the limited facility noted above. Moreover, many banks that are active in the London interbank market, including one of the ten largest banks in the world, are headquartered in countries with inconvertible currencies. Of course, as banks located outside the Group of 10 have been taking on an increasing share of the international market, the problem is becoming much more difficult to resolve.

It could be argued that the market will take care of the problem of banks without access to an LLR. Competition will force such banks either to offer depositors higher interest rates to compensate for the greater risk or to hold more liquid assets as a way of providing liquidity assurance. Either

way, these banks will earn an unacceptably low return on their capital and will eventually get out of the international market.

Unfortunately, under benign financial conditions, the markets demand virtually no default premium from banks without access to an LLR. These banks may grow and prosper for an indefinite period. If the world economy becomes vulnerable, a nontrivial shock such as the Herstatt crisis in 1974 may drastically alter perceptions of the risk associated with such banks. A few may be unable to attract any funds and fail (as at least one did following Herstatt). But if the shock is isolated, markets will soon return to "normal" and the banks that survive can remain competitive until the next shock.¹⁶ Of course, if the next shock is not isolated, banks without access to an LLR could become a key factor of contagion.

Proposals for Deposit Insurance

One proposal for reducing the probability of an international banking crisis while relieving the burden on LLRs, associated mainly with Grubel (1979), is to establish an International Deposit Insurance Corporation that would insure deposits around the world. The institution of deposit insurance in the United States in 1935 is widely credited with substantially reducing the fragility of the U.S. banking system, and it is thus plausible that the same benefits could be obtained internationally. Our analysis of this proposal suggests, however, that a deposit-insurance system would be even more difficult to implement effectively than an international LLR.

1. To dampen runs, a deposit-insurance system must be comprehensive in its coverage of bank liabilities, but a comprehensive international system would be politically impossible. It is very unlikely that countries such as the United States that have not seen fit to fully insure large domestic bank creditors would be willing to insure large foreign banks and billionaire oil sheiks.

In this connection, it is instructive to compare an international system with the domestic system in the United States. The domestic system has three objectives: to protect small depositors, to equalize the competitive position of small banks (which have mainly small depositors) vis-à-vis large banks, and to reduce the probability or severity of runs. The system has succeeded completely in the first two objectives but only partially in the third, because of incomplete coverage. Large depositors are not fully insured and nondeposit creditors are not insured at all. Hence, large banks with many uninsured creditors remain subject to runs. The point is well

¹⁶ While hard data are not available, evidently most of the tiering that followed the Herstatt affair had disappeared within a year or so.

illustrated by the cases of the Franklin National and First Pennsylvania Banks, which did not lose significant amounts of small deposits but did suffer substantial drains from large creditors, including other banks.

The U.S. experience indicates that, unless insurance is comprehensive, the system remains vulnerable to runs by uncovered creditors.¹⁷ This vulnerability is viewed as the price that must be paid for not offering coverage to large creditors, who are capable of looking after themselves and whose self-interest in the soundness of the banks to which they lend imposes market discipline on the banks. At the international level, there are few small depositors to protect. About three-fourths of all Eurocurrency deposits are interbank deposits. The only purpose of deposit insurance would be to dampen runs, and to accomplish this, insurance would have to be comprehensive.

2. A workable system of deposit insurance must also be comprehensive in its coverage of banks. A worldwide agreement would have to cover every country in which an international bank might conceivably operate, in other words, every country offering a reasonable level of security and adequate communications with the outside world. If banks in some countries are not covered, they would be in an advantageous position under benign financial conditions; they would not be obliged to pay insurance premiums but would not necessarily be obliged to offer creditors higher default premiums. Some countries might even set out to attract banks by staying out of the system. Then, when world conditions became shaky, depositors would run from uninsured to insured banks. One cannot be optimistic about the possibility of getting all countries that might attract international banks to participate in the deposit system.

3. To be workable, deposit insurance must be complete as well as comprehensive. If coverage is not complete, so that creditors of failed banks would suffer some loss (say 5 per cent), they will run as quickly as if there were no deposit insurance. Why keep your money in a shaky bank where you might lose 5 per cent of it when, without any significant cost, you can shift it to a sound bank? But insurance that is both comprehensive and complete presents enormous moral hazard. An insolvent bank with fully insured creditors can play go-for-broke indefinitely with what is essentially the insuring agency's funds. An LLR can at least limit its liability by refusing further loans, but an insuring agency cannot terminate its insurance

¹⁷ The U.S. experience also indicates that the commitment must be *de jure* as well as *de facto*. Since uninsured depositors of U.S. banks suffer losses only when a bank is liquidated, which happens rarely, it is sometimes asserted that deposit insurance *de facto* covers all deposit liabilities. Nevertheless, holders of large deposits still run in the event of trouble because they are not insured *de jure* and there is always the possibility of a liquidation.

commitment without “just cause”—a process which, judging from U.S. experience, can take many months, if not years. To protect itself, the agency must have extensive supervisory powers, including power to close a bank if the national authority does not. Few countries would be willing to grant such powers to an international agency.

Grubel suggests that moral hazard could be controlled by imposing co-insurance on depositors or by using a system of variable deposit-insurance premiums. The first suggestion is not workable because co-insurance gives depositors an incentive to run from banks under suspicion. The second requires that the insuring agency have extensive investigative powers, although it may not need the power to impose any sanction other than raising the insurance premium. But profound political problems would attend an increase in the premiums paid by banks in a particular country.

4. The insurance commitment of the insuring agency must be credible, which means that the agency must have vast resources or access to vast resources. While some arrangements for long-run sharing of the burden might be made, in the short run the major commitment for these resources would fall disproportionately on the countries in whose currencies international banking activity is conducted. Since about 70 per cent of Eurocurrency deposits are denominated in U.S. dollars, the major commitment would fall on the United States. It is unlikely that Congress would be willing to consider an enormous contingent obligation directed mainly to the support of foreign banks.

Conclusions

We have argued that the worst possible system would consist of institutions that purport to be LLRs for international banking activities but cannot control the risk exposure of international banks and will not be able to perform LLR functions for them when a crisis hits. We believe that this is, in fact, very close to the current arrangement for a significant number of international banks. National LLRs are inherently ill suited to provide effective assistance to international banks, and the probabilities are high that many of them will not be able to deliver when the chips are down. Yet attempts have been made to convey the impression that reliable LLR mechanisms are in place.

Effective LLR facilities are desirable, but if they are unattainable the “second best” arrangement would be an explicit indication of where LLR responsibilities stop combined with a general policy of reliance on private market mechanisms. The authorities should try to discourage banks from operating through entities or locating in centers where they are not adequately supervised by announcing that emergency assistance will not be

available to such banks. This was the implicit message of the Bank of Italy's reluctance to aid the Luxembourg holding company controlled by Banco Ambrosiano, but we think the message should be explicit. Greater disclosure regarding the condition of individual banks, perhaps to include timely information on country exposure, would reduce the moral hazard that the existence of an LLR tends to create. The development of private mechanisms for dealing with financial disorder, such as contractually established credit lines, could provide solvent nonbank borrowers in Eurocurrency markets with the same degree of assurance of credit facilities in a crisis that long-term customer relationships provide in domestic markets.

Effective market discipline based on substantial disclosure, accompanied by existing LLRs operating within domestic banking systems, would provide a good defense against illiquidity crises. Insolvency is another story, however. The main danger in international banking today is from a credit shock that would wipe out most or all of the capital of major international banks. Even if LLR arrangements were effective and banks not fatally damaged by such a shock had continued access to credit, the disruption caused by major bank insolvencies would require remedies that go far beyond the functions of an LLR.

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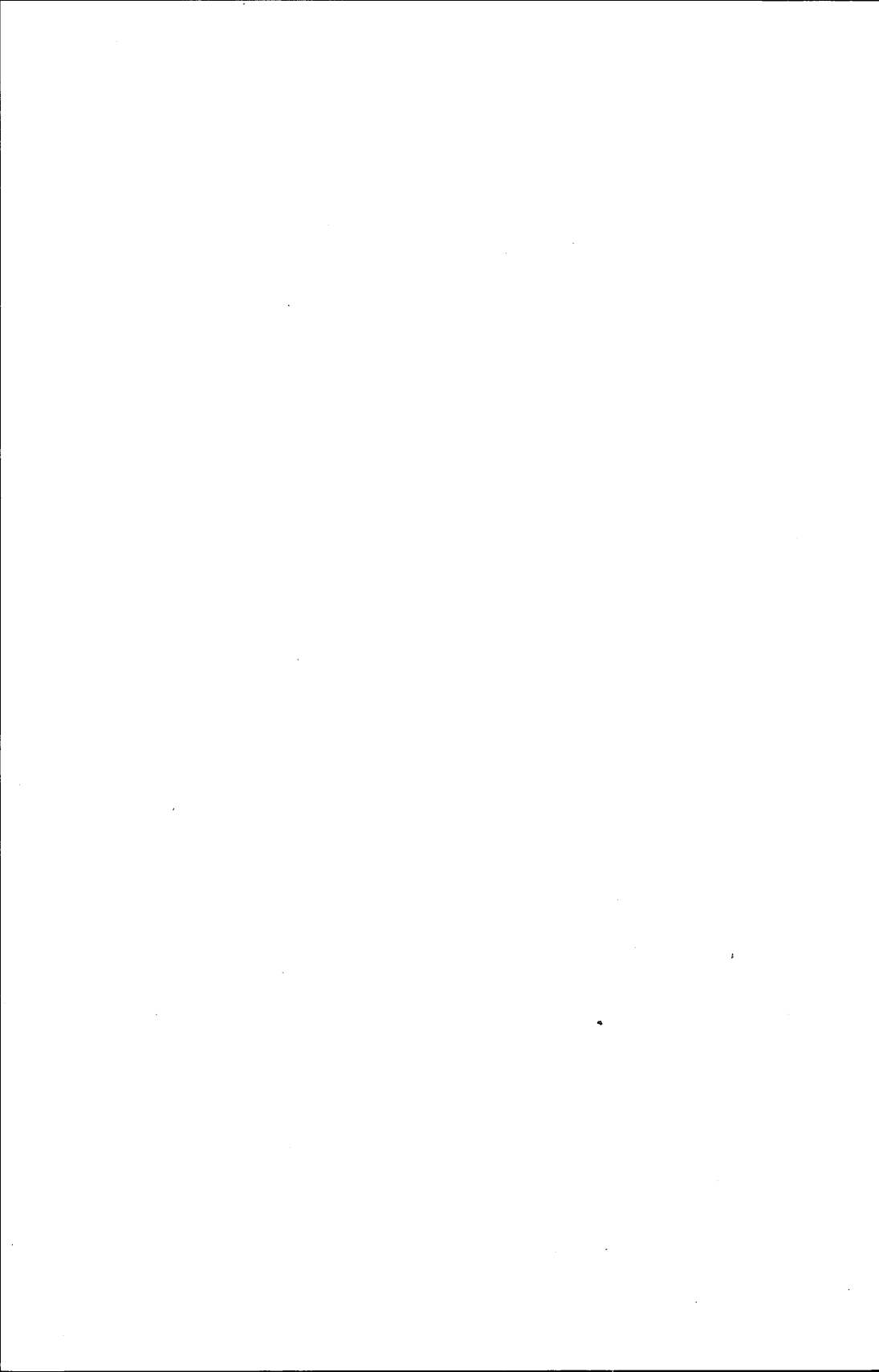
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