

Too-Big-to-Fail After FDICIA

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The special treatment historically accorded large failing banks—judging them “too-big-to-fail”—is an important issue in reforming deposit insurance. All unaffiliated depositors, and in some cases all creditors, at large failing banks have received 100 percent coverage of their funds even though coverage of only the first \$100,000 deposited at domestic branches is guaranteed by law.¹ Following this too-big-to-fail policy has been justified in part as necessary for preventing systemic problems that might grow from a larger bank’s difficulties. However, the policy itself created problems. It tended to reduce the incentive for large depositors to exercise market discipline, and it tended to increase the cost of resolving large failing banks.² Further, operating under a too-big-to-fail policy created a dilemma for bank regulatory agencies, which had to either leave large depositors at small banks uninsured and create an artificial incentive for large deposits to be shifted to too-big-to-fail banks or cover all deposits at all banks, further reducing market discipline at small banks and increasing the cost of resolving small bank failures.

Congress addressed the too-big-to-fail issue as a part of its deposit insurance reform bill, the Federal Deposit Insurance Corporation Improvement Act of 1991 (FDICIA). Section 141 of the act generally requires the resolution of failed banks at the lowest cost to the FDIC, though it provides for an exception that preserves the potential for banks to be considered too-big-to-fail. The exception may be invoked if failure to do so would “have serious adverse effects on economic conditions or financial stability” and providing

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additional FDIC coverage “would avoid or mitigate such adverse effects.” FDICIA allows the exception only with the agreement of a two-thirds majority of the Board of Directors of the Federal Deposit Insurance Corporation, a two-thirds majority of the Board of Governors of the Federal Reserve System, and the Secretary of the Treasury (“in consultation with the President”).

Two of the goals of FDICIA are to reduce both the potential for systemic problems and bank regulatory agencies’ incentives to follow a too-big-to-fail policy. Having given a mandate to banking agencies to minimize FDIC losses, the act’s prompt-corrective-action provisions provide a structured way of addressing a problem bank. A system of automatic review is set in motion whenever a bank failure imposes material costs on the FDIC or when the FDIC treats a bank as too-big-to-fail.³ Specific changes intended to limit systemic risk include requiring the Federal Reserve to impose limits on interbank liabilities, authorizing the FDIC to provide for a final net settlement to a failed bank’s creditors, and establishing statutory backing for net settlement provisions in bilateral and clearing-house payments agreements.

FDICIA also leaves in place the Federal Reserve’s discount window, which is a powerful tool for addressing systemic risk. Indeed, only the Federal Reserve is guaranteed to have the resources to be able to address virtually all conceivable systemic risk situations because only the Fed has the power to create money. However, FDICIA discourages inappropriate uses of the discount window by requiring the Federal Reserve to share in the FDIC’s losses if lengthy Fed lending to a failing bank causes an increase in the FDIC’s losses.⁴

FDICIA substantially reduces if not eliminates most of the dangers associated with the failure of a large bank. Some systemic risk issues remain, however, and the purpose of this article is to review those concerns as well as FDICIA’s provisions designed to reduce such risks. Probably the biggest unresolved issue is what the effects of a large bank’s failure would be. According to some preliminary analysis, a too-big-to-fail policy may not be needed to protect financial markets.

Systemic Risk

The concern about systemic risk stems from a fear that a single bank failure could reverberate through the

banking system and cause widespread bank failures, adversely affecting bank customers and the real economy in a number of ways. However, not every run on a large bank automatically generates systemic problems. A depositor run on any nonviable bank not 100 percent insured is rational and helps speed closure of an institution that should be closed. Further, the argument that large bank creditors suffer losses in such a closing is not, in and of itself, a legitimate systemic concern.⁵

Systemic risk arises when an institution’s failure interferes with financial services consumers’ ability to obtain important financial services in a timely manner to such an extent that overall economic activity is reduced.⁶ Systemic problems result if the failure of a large bank causes contagious runs on viable banks, thereby diminishing the overall availability of financial services. In addition, failure of a single institution may generate systemic problems if it significantly impairs the payments system or financial markets. This section highlights the channels through which it would be possible for systemic risk concerns to arise. An analysis of the actual magnitude of these risks prior to FDICIA is provided in the box on page 7.

Risks to Other Banks. The failure of one bank poses a potential risk to other banks in a number of ways. For example, other banks could suffer insolvency because of losses on interbank deposits and other forms of credit. They risk illiquidity if access to interbank deposits is delayed or if contagious deposit runs occur. The extent of such risks is usually, but not always, proportional to the size of the failing bank. Larger banks have more interbank deposits likely to be at risk if depositors are not covered, and large bank failures are likely to be noticed by more depositors.

The magnitude of the credit and direct liquidity risks is also a function of whether the collapse of the failed bank occurs over a long period of time or comes as a surprise. If the failure is anticipated, other banks will have had time to implement steps limiting their exposure to the failing organization. In this vein, financially strong banks have recently been limiting their exposure to banks with lower credit ratings in the interest rate and currency swap markets.

Risks to the Nonbank Sector. Nonbank customers and even third parties may also be hurt by a bank’s failure. Creditors, including large depositors, directly risk default losses and reduced liquidity when a bank fails. While these risks are analogous to those taken by providers of interbank credit, they differ principally in that nonbank customers, especially small businesses, may have less access to other sources of liquidity.

Nonbank firms can turn to the Federal Reserve discount window under certain situations if a substantial liquidity problem arises, but the central bank has strongly preferred to avoid such lending.⁷ Moreover, even if the Federal Reserve chose to lend to nonbank customers, the discount window is not structured to serve as a direct lender to a large number of small businesses.⁸

The ability of bank customers to make payments depends not only on their bank's being solvent and liquid but also on the operation of various payments systems. The failure of a large correspondent bank, which provides check-clearing, ACH, and other ongoing payments services to certain small banks, could directly affect the small banks' access to certain parts of the payments system. Moreover, such a failure could lead to a loss of confidence in bilateral and clearinghouse arrangements that handle a large fraction of the payments transactions. While the Federal Reserve is an important supplier of many payments services and could help sustain confidence in its systems, private arrangements play a critical role in some—especially international—payments systems.

Another problem nonbank customers might face when a bank fails is a temporary reduction in credit availability. Such a reduction might affect local economic conditions adversely.⁹ However, implementing a too-big-to-fail policy would protect bank borrowers only to the extent that doing so would prevent contagious runs on viable banks. Borrowers are not necessarily protected by efforts to protect depositors because whoever holds the loans after the bank's failure does not have to extend any prefailure loans. Further, because the postfailure loanholder could demand repayment at the earliest time permitted by the loan contract, protecting a failed bank's depositors would not protect its borrowers.

This list of issues has recently been expanded by increased concern about ways a bank failure would affect financial markets. Banks play an increasing role as market makers in many financial contracts, especially for interest rate and foreign exchange contingent contracts such as options, forward contracts, caps, floors, and swaps. The failure of certain large banks might significantly reduce this market-making capacity for some types of financial contracts. More generally, a bank's failure could result in a loss of confidence in certain markets, with the result that some banks would be unable to maintain adequate hedges for their existing exposure.

Systemic Risk. While certain problems plague a too-big-to-fail policy, it is nonetheless an effective way to limit systemic risk. It prevents one bank's fail-

ure from creating any direct solvency or liquidity risk for other banks or nonbank creditors. Its enactment also reduces the risk of contagious runs at other banks by reassuring their depositors. A challenge FDICIA attempts to meet is establishing ways to eliminate the too-big-to-fail doctrine while continuing to minimize systemic risk.

Incentive Changes

FDICIA both provides regulators with various tools for addressing problem banks and suggests changes in regulatory procedures.¹⁰ A simple reading of the act may not disclose its real significance, however. Before FDICIA, regulators already had the power to enforce capital requirements and to stop unsafe or unsound banking practices. Thus, many of the tools the legislation specified were implicit in the agencies' existing authority. Moreover, many of the most important suggested changes in regulatory procedure are simply suggestions (as Richard Scott Carnell 1992 points out). The regulatory agencies retain substantial discretion in their treatment of problem banks, especially large ones.

The act's real significance is that it both provides the banking agencies with a clear goal of minimizing deposit insurance losses and sets up an incentive system to encourage compliance. The most important part of the act in terms of setting the goal and incentive system is section 131, which provides for prompt corrective action. That section begins by giving banking agencies one goal: "to resolve the problems of insured depository institutions at the least possible long-term cost to the deposit insurance fund." Toward that end, regulators are encouraged to strengthen bank capital, to respond to reduced capital levels by taking strong action that will limit risk and encourage recapitalization, and to close failing banks before they exhaust their equity capital. The provisions for prompt corrective action outline a number of steps that bank regulators may take as an institution's capital ratios decline. Although regulators generally retain the authority to tailor their actions to the specific circumstances, FDICIA mandates action in two particular situations: (1) banks that are undercapitalized must submit an acceptable plan to restore their capital to adequate levels, and (2) banking agencies must take action within ninety days of a bank becoming critically undercapitalized, with the act containing a bias toward receivership or conservatorship.¹¹

Although the prompt-corrective-action guidelines specify regulatory action, they include a mandatory ex post review of any failure that imposes material costs on the FDIC and thus provide an incentive for regulators to prevent costly bank failures. If a material loss occurs, the inspector general of the appropriate banking agency must determine why and must make recommendations for preventing such a loss in the future. This report must be made available to the Comptroller General of the United States, to any member of Congress upon request, and to the general public through the Freedom of Information Act. Further, the General Accounting Office must provide an annual review of the reports and recommended improvements in supervision. These reporting and review requirements do not force the banking agencies to make any substantive changes in their supervisory practices. However, as discussed, these provisions supply strong political incentives to prevent costly bank failures.

Two sections of FDICIA—sections 141 and 142—change the legislative guidelines for deposit insurance and discount window decisions on banks that might be considered too-big-to-fail. Section 141 generally requires the FDIC to resolve bank failures at the least possible cost to the deposit insurance fund. The agency must document its evaluation of the alternative methods of resolving a failed bank, including the key assumptions on which the evaluation is based.

While section 141 permits a systemic risk exception to least costly resolution, it also provides for increased accountability when this exception is invoked. The FDIC, the Federal Reserve, and the U.S. Treasury must all agree that an institution's ill-health poses a systemic risk. The Secretary of the Treasury is required to document evidence indicating the need to invoke the systemic risk exception. The General Accounting Office must review any actions taken, examining the basis for finding action necessary and analyzing the implications for the actions of other insured depositories and uninsured depositors. The rest of the banking industry, required to pay the cost of a bailout through an emergency assessment to the FDIC that is proportional to each bank's average total tangible assets, is likely to act as a kind of watchdog.¹² The special assessment provides a strong incentive for the industry to question covering uninsured depositors, particularly when there is room for doubt about whether a failure would create systemic risk.

Section 142 limits the Federal Reserve's ability to provide through its discount window de facto too-big-to-fail treatment of a failing bank. Allowing a bank to

borrow at the discount window makes it possible for uninsured deposits to be withdrawn prior to the resolution of a failing bank by providing the liquidity needed to cover withdrawals. This section of FDICIA limits such lending to undercapitalized banks to 60 days within any 120-day period unless the bank is certified as viable by the Federal Reserve or its primary federal bank regulator.¹³ For banks that are critically undercapitalized the Federal Reserve is instructed to demand repayment no later than at the end of five days. If violation of the five-day limit occurs, the Fed is liable for part of the increased cost to the FDIC, and the Board of Governors of the Federal Reserve must notify Congress of any payments to the FDIC under this provision. Under FDICIA the Federal Reserve discount window retains substantial legal authority to lend to problem banks, but failure to comply with the intent of this portion of the act exposes the Fed to substantial ex post political pressure.

FDICIA clearly provides a mandate to banking agencies and seeks to create a system whereby there is political incentive for the agencies to follow the mandate. The biggest changes to occur as a result of the act will most likely result from the new climate of postfailure reviews and sanctions rather than from formal changes in the agencies' legal powers.

Changes that Mitigate Systemic Risk

Along with supplying a mandate to minimize FDIC losses, FDICIA addresses a number of systemic concerns raised by the banking agencies. The act aims to reduce the systemic risk associated with ending a too-big-to-fail policy by enhancing the overall stability of the banking system, by reducing the losses when a bank fails, and through targeted reforms that address specific potentially systemic problems.¹⁴

Enhanced Stability and More Timely Closure. A number of reforms in FDICIA call for reducing the likelihood of bank failure. The prompt-corrective-action provisions should result in higher bank capital ratios and are intended to ensure more timely supervisory intervention. The act requires that regulators revise existing credit risk-based capital standards to take account of interest rate risk, concentration of credit risk, and the risks of nontraditional activities. In addition, banks must undergo an annual, full-scope, on-site examination and an independent annual audit. These measures should help prevent significant undetected problems from arising at banks.

The prompt-corrective-action requirements that critically undercapitalized banks be placed in conservatorship or receivership mean that banks may be closed earlier with reduced losses to creditors.¹⁵ Banks may also be closed earlier with higher expected recoveries to the extent that uninsured depositors become more likely to run on failing banks because of FDICIA's provisions virtually eliminating coverage of uninsured depositors.

Limits on Interbank Credit Exposure. The banking system relies heavily on interbank extensions of credit for intraday, overnight, and longer-term purposes, but interbank credit is a potential source of systemic risk. FDICIA directs the Board of Governors of the Federal Reserve to develop a regulation limiting interbank credit exposure. The Board has adopted a new Regulation F on interbank liabilities to satisfy this part of FDICIA.¹⁶ The regulation restricts a bank's total exposure to its correspondent to 25 percent of the respondent's capital unless the correspondent is at least adequately capitalized.¹⁷

Final Net Settlement. Without immediate access to their funds at a failed bank, both bank and nonbank creditors could face severe liquidity problems. FDICIA addresses this problem by authorizing the FDIC to make a final settlement with creditors when it assumes receivership of a failed bank (section 416). Under these provisions uninsured and unsecured creditors may gain immediate access to their funds. The FDIC pays a sum that is the product of the amount of uninsured and unsecured claims times a final settlement rate. The final settlement rate is to be based on average FDIC receivership recovery experience so that the FDIC receives no more and no less than it would have as a general creditor standing in the place of the insured depositors. The FDIC's exercise of full powers under the final settlement provision should substantially alleviate liquidity problems for bank creditors.

Netting of Interbank Payments. Many payments systems result in banks' experiencing substantial intraday credit exposure to other financial institutions. This exposure may arise both as a result of bilateral agreements and through payments clearing organizations. FDICIA seeks to reduce the risk in these payments systems by explicitly recognizing contractual netting agreements and holding them legally binding if a member financial institution is closed. (Section 403 establishes that bilateral netting agreements are binding, and section 404 applies to clearing organization netting.)

Implications of the Changes. The net effect of FDICIA should be to reduce interbank risk substan-

tially. The prompt-corrective-action provisions and the increase in market discipline are expected to constrain bank risk taking and increase the FDIC's rate of recovery from failed banks. In combination, these factors should almost eliminate the risk that one bank's failure would cause insolvency at other banks.¹⁸

The final settlement procedure provides the FDIC with a mechanism for resolving potential liquidity problems at creditor banks or nonbanks. The netting procedures under FDICIA further reduce the risk associated with payments systems. Any remaining credit risk is likely to be small as long as banks comply with the limits on interbank credit exposure.¹⁹ The final settlement procedures and payments system netting together should eliminate most of the liquidity risk associated with the payments system. Any remaining liquidity problems could be addressed by the Federal Reserve discount window. Although FDICIA places increased limits on the discount window, as mentioned earlier, the Fed may still lend to adequately capitalized banks and to undercapitalized banks that the Fed (or the bank's primary federal supervisor) certifies as viable.

Unresolved Issues

FDICIA addresses a number of issues associated with large bank failure. However, at least two possible areas of concern remain: the effect of a large bank's failure on financial markets and the effect of sudden massive losses at one or more banks.

Financial Markets. A bank's failure could adversely affect selected financial markets by forcing the immediate unwinding of a large number of hedging transactions, by weakening confidence in derivative products that create credit exposure, and by causing the loss of one market maker.²⁰ These relatively new issues have received less attention than many others related to systemic risk. Nonetheless, some preliminary analysis is possible.²¹

Knowledge of the implications of large bank failures is most limited in the area of over-the-counter derivative products such as interest rate, foreign exchange, and commodity swaps. Available insight has been derived primarily from the failures of a few large financial institutions, including Drexel, Burnham, Lambert and the Bank of New England. These products seem to have several difficulties, but the biggest ones appear unrelated to systemic risk issues. The problems include (1) contract language in many swap agreements

that may yield a windfall profit to counterparties of the failed bank, (2) the occasional inability to unwind derivative contracts at market prices after the institutions' financial problems have become apparent, and (3) increased cost of or inability to maintain adequate hedges at the failed institution while it is unwinding its derivatives book.²²

The failure of a bank with a large over-the-counter derivatives book poses two risks to its counterparties: credit risk and the risk that the derivatives contract will be closed and the counterparty will lose its hedge. Evaluation of the credit risk is complicated by the nature of most derivatives. Although the size of many markets for over-the-counter derivatives, such as interest rate swaps, is measured by the notional principal of the underlying contracts, this measure generally overstates risks for two reasons. Actual payments on many types of derivatives are a small fraction of the notional principal.²³ Further, at any given time a bank is likely to be winning on some contracts and losing on others. Credit losses to a failed bank's counterparties arise only on those contracts under which the failed bank owes money.²⁴

However, the measure that is the obvious alternative to the notional principal, the current credit exposure of the derivatives book (mark-to-market value of those contracts that have positive value to the bank), may understate exposure for many banks affected by systemic risk. The credit exposure on derivative contracts varies with changes in the value of the underlying commodity (interest rates, foreign exchange rates, and so forth). In a systemic risk situation, there may be sharp price movements in the underlying commodity and large changes in the value, and hence credit exposure, of banks' over-the-counter derivatives book. Current U.S. regulatory practice at least partially compensates for the increased risk by requiring banks to maintain capital proportionate to the amount of potential increases in credit exposure.²⁵ The potential losses to derivative counterparties are limited in two ways: expected credit losses from failed organizations will likely be a small fraction of exposure, and liquidity problems may be addressed by final settlement procedures or the discount window.

A potentially serious problem related to over-the-counter derivatives is the effect of failure on the hedging position of counterparties. These derivatives purchased from large commercial bank dealers are used by corporations and institutions to hedge exposure to interest rate, foreign exchange, and commodity price changes. The failure of the bank dealer may result in early termination of the contracts, raising con-

cerns in two areas. First, the bank's counterparties need to know when the contract will be terminated so that they can arrange for a substitute hedge.²⁶

The second consideration is that the counterparties affected by early termination of derivatives contracts will need to reestablish their hedge positions in the over-the-counter derivatives market as quickly as possible to minimize their risk exposure. Most financially strong corporate and institutional users would be unlikely to have problems doing so, given the number of dealers in most markets. However, users whose financial condition had weakened may face greater costs in arranging a hedge.²⁷

There may also be systemic implications in the failure of a large bank that results in the immediate termination of all over-the-counter derivatives contracts. Such a failure on the part of a major bank dealer could significantly, if only temporarily, reduce dealer capacity in some derivatives markets. Further, even if remaining dealers have the capacity to service the additional demand, individual dealers may face binding bilateral credit limits that restrict their ability to deal with specific counterparties.²⁸ Although these limits are most likely to be binding on interdealer hedging trades, that dynamic could reduce dealers' ability to arrange hedges for end-users.²⁹ Credit limits may also pose a problem in another way: new information that enters the market through a bank failure may cause a reevaluation and possible reduction of selected credit lines by some dealers. There is, therefore, at least the potential for some users to face significant problems reestablishing their hedges in the wake of a major bank dealer's failure.

It is important, however, in evaluating the use of the too-big-to-fail doctrine to protect financial markets, to recognize that whatever problems arise are rooted in a bank's failure, not its treatment of creditors. Providing the protection for uninsured creditors is significant only in that preventing runs may allow more time for the development of new market makers and expanded capacity at existing firms. Even this significance is limited, though, because a bank will come under prompt-corrective-action provisions as its capital position declines, and market participants will be warned about the possible restrictions facing a large market maker. Further, if the loss of market-making capacity through an institution's closing would pose a serious problem, then supervisors should consider encouraging the bank to begin phasing out its market-making activities before it becomes critically undercapitalized so that the market may gradually adjust to the reduced capacity.

Systemic Risk before FDICIA

An important issue in evaluating whether FDICIA is contributing significantly to reducing systemic risk is determining the baseline likelihood of a financial system collapse among generally viable banks before FDICIA. Three commonly expressed concerns about large bank failure need to be considered: The first is the idea that interbank liabilities could generate credit losses leading to widespread insolvency or that delays in access to interbank liabilities could cause widespread illiquidity. The second concern is that the failure of a large bank might spark runs on viable banks. The third, and farther-reaching, fear is that payments systems may collapse in the wake of a large bank's failure.

The analysis below seeks to address two questions central to evaluating FDICIA's merit: (1) What are the odds that one of these three problems would in fact emerge, and (2) how do the banking agencies' pre-FDICIA tools for mitigating a problem at a large bank compare with the tools post-FDICIA?

Interbank Liabilities

The most direct risk a large bank's failure poses for other banks is that they will lose part or all of their investment in that bank. A sudden failure incurring massive losses could threaten the financial stability of respondent banks. However, determining the level of systemic risk should include distinguishing maximum possible losses from expected losses. Expected losses for a bank closed when it first becomes insolvent are likely to be a small fraction of possible losses. For example, total interbank exposure to Continental Illinois greatly overstated other banks' likely losses when Continental was rescued by the FDIC. There were 65 banks with uninsured balances in Continental exceeding 100 percent of their capital, and another 101 banks had uninsured balances equal to between 50 percent and 100 percent of their capital. However, if a recovery rate of 90 percent is assumed for Continental's assets, no banks would have had losses in excess of their capital and only 2 banks would have had losses equal to between 50 percent and 100 percent of their capital.¹ George G. Kaufman (1990) states that the FDIC's estimated recoveries at the time of failure of Continental were 97 percent to 98 percent and that the current estimate is 96 percent.

Even when a failure would not result in substantial credit losses on interbank deposits, theoretically it might still place other banks at risk if they could not obtain immediate access to their funds or if they were to experience a run by depositors fearing insolvency or illiquidity. However, the danger is not as great as it sounds. Even if

the FDIC did not provide immediate access to interbank deposits, other banks would not necessarily fail because of illiquidity. A bank widely recognized as viable despite temporary illiquidity could probably borrow from other banks or the Federal Reserve discount window.

Contagious Bank Runs

One bank's failure may lead to withdrawals at other banks if customers lose confidence that their deposits will be fully redeemed. Depositors may also lose confidence because the failure discloses new information on the value of other banks' assets.²

The likelihood that financial markets will mistakenly run on solvent banks is important in evaluating the risk of bank runs. Empirical evidence suggests that financial markets generally are able to assess the implications of new information accurately. For example, analysis of the Mexican debt crisis revealed that the stock market responded to individual bank stocks in proportion to each bank's loan exposure even though such information had not been publicly released.³ Studies of five major domestic failures also found no substantial evidence of contagion risk.⁴ Further, when a misleading television story prompted a run on Old Stone, the thrift was able to stop the run within two days by convincing investors it was solvent.⁵

There are also some puzzling examples of possible market mistakes, however. The failure of the Overseas Trust Bank in Hong Kong and that of Penn Square Bank in the United States are two such cases. Gerald D. Gay, Stephen G. Timme, and Kenneth Yung (1991) found evidence that the failure of the Hong Kong bank had a significant negative impact on other banks in the city. This result is surprising because the Overseas Trust Bank's failure resulted from fraud, and such conditions would generally not be expected to provide significant information about other banks. In the case of the Penn Square Bank, Robert E. Lamy and G. Rodney Thompson (1986) and John W. Peavy III and George H. Hempel (1988) discovered that banks with no direct connections to the organization nevertheless suffered significant losses in stock market valuation after that bank failed. Lamy and Thompson suggest that the drop in market value reflected the fact that Penn Square was liquidated with losses to depositors, and this action could have raised doubts about coverage afforded other banks. Another explanation, by Peavy and Hempel, is that the market may have overreacted to the news of Penn Square's failure. Supporting that hypothesis, their findings indicate that losses suffered immediately after the failure by banks not

directly connected to Penn Square were subsequently offset by significant positive abnormal returns for institutions.

Another study supplies weak evidence that there may be reason for concern about contagious runs. Randall J. Pozdena (1991) found that similarities in stock returns for firms in the same industry were much greater in banking than in other industries, suggesting that bank values may be more dependent on a common set of factors than those of many other industries. Pozdena also found that similarities in returns were fewer among banks with higher capital ratios.

Thus, there seems to be a risk that the failure of a large bank could spark contagious runs on viable banks if the markets fail to distinguish viable from nonviable banks. Studies of financial market performance generally suggest that markets tend to assess the implications of new information accurately. Some evidence of occasional errors has been found, however. Thus, at least a small potential for contagious runs apparently exists. The risk is minimized, though, by the Federal Reserve's option to provide funding to any viable bank experiencing a run.

Payments Systems

Other banks and the financial system may be exposed to a failed bank through their joint connections to the payments system.⁶ The risk may occur through one of several mechanisms—the bilateral provision of services from the failed bank to its respondent, securities positions taken by the failed bank that need to be unwound, or a failure's effect on payments clearinghouses. The discussion that follows focuses on the potential for a bank failure to disrupt the processes by which payments are made in the banking system.⁷

Many small banks are dependent on correspondent banks for services such as check clearing, automated clearinghouse services and access to international payments systems. Loss of access to these services could create significant problems for some respondent banks, especially those that are too small to participate directly in certain payments systems. If a failing bank deteriorates gradually, respondents may reduce their risk by shifting their payments system business to other banks that are still financially strong or by making contingency plans. However, respondents that are still dependent at the time of failure would not necessarily lose access to the payments system. In the case of a troubled institution large enough to be an important supplier of correspondent services, the FDIC, under FDICIA, would likely try to sell the bank and could otherwise be expected to create and operate a bridge bank. Because the FDIC has these powers, invoking a too-big-to-fail policy is not es-

sential for preserving respondent banks' access to the payments system.

Another bilateral issue that can affect payments systems concerns exchanging cash and various securities. The problem is that the exchange of value does not always occur simultaneously. Solvent parties are reluctant to surrender their part of the transaction before receiving value from the bankrupt party for fear that prompt and full payment will not be forthcoming. William S. Haraf (1991) noted that this situation occurred with the failure of the securities firm of Drexel, Burnham, Lambert in 1990 and that third parties were affected by the disruption.⁸ Haraf also notes, however, that changes, some of which are being implemented, to the payments and settlement systems designed to shorten or eliminate lags in payments would be more efficient than resorting to declaring certain institutions too-big-to-fail. (He further notes that, despite some delays in winding up Drexel's affairs, their positions were ultimately liquidated.)

Multilateral clearinghouse arrangements may also be strained by the failure of a bank. These arrangements allow their bank members to make payments to each other with a single net payment at the end of each day to cover any net credit balances.⁹ Transactions through clearinghouses may generate significant bilateral credit between banks. If the clearinghouse lacks a binding netting agreement and one bank fails to make a required payment, the failed banks are converted to bilateral agreements and the net positions of all other banks are recalculated. The danger is that banks that could have met their net position with the failed bank included may be unable to do so if the failed bank's position is excluded.¹⁰ Thus, the potential exists for a single bank's failure to cascade through a payments system, forcing a number of banks to become illiquid and causing a loss of confidence in the entire netting arrangement.

The Federal Reserve has worked to reduce this risk by requiring banks to monitor and establish caps on their intraday liabilities and credit exposure to other banks. In addition, as a continuation of pre-FDICIA efforts to contain payments system risk, the Federal Reserve is imposing interest charges on banks that run large intraday overdrafts on Fedwire.¹¹ If a problem arises despite these restrictions the Federal Reserve retains adequate power under FDICIA to provide discount window loans to viable banks that temporarily lack liquidity.

Summary

Two common themes run throughout this review of the risk of systemic problems in the absence of a too-big-to-fail policy prior to FDICIA. First, although some risk of losses on interbank liabilities, contagious runs,

and failures in the payments system existed, that risk frequently has been overstated. Second, the Federal Reserve could have contained most systemic risk situations through the discount window.¹² The most likely system risk scenarios would have involved temporary, widespread liquidity problems but limited actual solvency problems. The Federal Reserve's discount window had, as it does now, the resources to resolve temporary liquid-

ity problems. Furthermore, the Federal Reserve has historically had detailed, timely information on banks as a result of its supervision and regulation, and on the payments system as a consequence of its role as a provider of payments services. Thus, the Fed has had both the tools and the knowledge required to effectively address systemic risk situations arising from temporary liquidity problems.

Notes

1. These figures on other banks' exposure to Continental Illinois came from U.S. Congress (1984, 16-18).
2. Finance theory provides a third reason for depositors to lose confidence: they could become concerned about their bank's inability to meet an increase in demand for liquidity by other depositors. Diamond and Dybvig (1983) have developed a model in which banks are solvent at the beginning of the period but are subject to a random amount of withdrawal by depositors. The bank must prematurely liquidate projects at a loss if deposit withdrawals are too high. If too many projects are liquidated, the bank may become insolvent. Empirical examples that correspond exactly to the Diamond and Dybvig model are hard to find. However, the U.S. banking system in the late 1800s and early 1900s was subject to periodic liquidity crises during and shortly after harvest season, and some evidence suggests that the crises were due entirely to liquidity concerns about individual banks. A model of inelastic currency supply developed by Champ, Smith, and Williamson (1991) suggests the potential for periodic liquidity crisis and provides some evidence on the problem. However, Calomiris and Gorton (1991) raise questions about this history of panics in the period prior to the formation of the Fed. In any case, such random withdrawal models are not closely examined here because there is no evidence to suggest that such a problem has occurred since the Fed's creation or that the Fed could not fully resolve any liquidity-based runs with its existing authority. The Federal Reserve can and does provide an elastic supply of currency and liquidity.
3. See Cornell and Shapiro (1986) and Smirlock and Kaufold (1987).
4. Aharony and Swary (1983) found that no significant abnormal bank stock returns occurred around the failures of the United States National Bank of San Diego in 1973 and Hamilton National Bank in 1976. They did find significant negative abnormal returns associated with the failure of Franklin National Bank in 1974, but they suggest that this result could be based on a revaluation of the risks associated with foreign exchange trading. Aharony and Swary further note that some European banks were taking foreign exchange losses around this time. Former FDIC Director Irvine H. Sprague (1986) argued that regulators were concerned about the potential failure of other large banks if Continental Illinois failed in 1984 with losses to depositors. Saunders (1987), Swary (1986), and Wall and Peterson (1990) failed to find clear-cut evidence to support the regulators' concerns. Dickinson, Peterson, and Christiansen (1991) also failed to find evidence of contagion around the time of the failure of the First Republic Bank in 1988.
5. The story of how the run was stopped is provided by Leander (1991).
6. Haraf (1991) has noted that the failure of a nonbank institution can also impose strains on various payments mechanisms. For example, Fedwire and the Clearing House for Interbank Payments (CHIPS) were forced to remain open longer than usual to accommodate problems arising from the failure of Drexel, Burnham, Lambert.
7. See Baer and Evanoff (1990) for a review and analysis of the issues associated with large dollar value payments systems. Roberds (forthcoming, 1993) discusses ways of further controlling the risks of those systems.
8. Moen and Tallman (1992) found that the failure of nonbank firms also disrupted the payments system in the Panic of 1907.
9. For an example of such a system, see the discussion of CHIPS provided by the Group of Experts on Payments Systems (1990, 131-42).
10. Given that the failed bank was presumably financially weak immediately prior to failure, there is a high probability that depositors were, on net, withdrawing substantial amounts of money from the failing bank. These withdrawals would likely be transferred to other banks, with a substantial part of the withdrawals going through clearinghouses. Thus, odds are relatively high that, if a bank fails, it will be a large net payer to various clearinghouses.
11. See Cummins (1992) for a discussion of the Federal Reserve's decision to charge for intraday overdrafts.
12. See Smith and Wall (1992) for a discussion of how discount window and deposit insurance operations could address systemic risk issues without reliance on a too-big-to-fail policy.

Financial markets are also likely to take actions that would reduce their costs associated with the loss of a market maker if the problem bank's financial condition deteriorates gradually. Market participants may shift business to other market makers as a hedge against the institution's possible failure. Moreover, the troubled bank may find that its trading operations are more valuable if sold than if forced to operate as part of a financially weak organization.³⁰ Alternatively, there may be market adjustment through the individuals whose trading and technical expertise are at the heart of any securities trading operation. These key people may seek to leave the ailing bank or may be bid away by an organization having the resources to support and expand their trading operations.

Overall, there are some risks to financial securities markets when a large bank fails. Although the problems are likely to be temporary, some users may very well have problems arranging substitute hedges in a timely manner. Further research is needed on several issues: (1) the rate at which lost market-making capacity is replaced, (2) the likelihood that credit limits restrict dealers' ability to service users and engage in interdealer hedging, (3) the significance of the costs associated with a temporary reduction in liquidity, and (4) the significance of a large bank's exposure to risk if it lost access to derivative markets for several days.

If policymakers were to conclude that a too-big-to-fail policy is necessary to protect banks that are financial market makers, there would be implications for securities firms that have a similar presence in many financial markets. Securities firms not affiliated with bank holding companies currently have neither insurance like that provided banks by the FDIC or a mandate to comply with safety and soundness regulations like those imposed on banks. Although securities firms are partially regulated by the Securities and Exchange Commission (SEC), the agency regulates only some subsidiaries, and in any case, its historical mandate is consumer protection rather than maintaining financial system stability. If certain banks are considered too-big-to-fail in order to protect the securities markets, logic would suggest that securities firms should receive similar coverage and that the provider of liquidity or solvency guarantees should be able to protect itself via banklike safety and soundness regulations.

Unexpected Massive Losses. The mechanisms that may soften the impact of failure on the financial system are most effective in dealing with slow deterioration of one or more banks. In a variety of ways regulators and markets can gradually disengage troubled banks from the financial system and limit the

damage of failure. However, a sudden massive loss at one or more banks could create a situation in which the market's exposure to a failing bank would be at its maximum, and regulators would be in a weak position to implement their full array of crisis management tools.

Fortunately, such economic losses appear to be exceptional. Sudden losses greater than a bank's capital are possible only if a bank has a very large concentration of risk to a single factor such as interest rate risk, foreign exchange rate risk, or having borrowers from a single geographic area that is devastated. Rather than truly being sudden, large losses may only appear to be so because banks and bank regulators have failed to provide for the timely recognition of reductions in asset values. Most often private sector parties will have begun reducing their exposure as soon as economic capital is significantly impaired, even though delays in accounting recognition may have slowed regulatory action.

Notwithstanding the extremely low probability of an unexpected failure of a previously well capitalized large bank that is engaged in a number of complex activities, such a failure would create a big problem for the regulators. The FDIC may be able to avoid invoking the systemic risk exception but only if it and the failed bank were exceptionally prepared for such a contingency. The FDIC would have to identify the bank's insured and uninsured creditors and calculate appropriate payouts for each of them. The Federal Reserve could buy a little time for the FDIC by exercising its discount window power to lend to a critically undercapitalized bank for five days. However, the failed bank would be crippled prior to its closure with a massive outflow of uninsured deposits, severe limits on its access to the payments system, and an inability to function in the over-the-counter derivatives market. Even with the additional time, the FDIC probably would be forced to establish a bridge bank while it evaluated alternative methods of resolving the failure. Further, the FDIC probably would not have time for careful review of the bank's books to determine the amount and type of each of the institution's liabilities (including off-balance-sheet activities). The FDIC could readily evaluate all liabilities only if the bank had organized its financial records in a way that permitted quick access.

Although it might be possible to manage a single bank's unexpected failure, the situation would probably be unmanageable in the even more unlikely case that the viability of a number of large banks became questionable. With several large banks in trouble, de-

positors would be likely to demand immediate withdrawal of their funds, refraining only if the government were providing 100 percent deposit insurance. Because regulators have limited operational resources (such as people) and may also face financial constraints that restrict the number of bank closings they can handle at one time, they may want to provide 100 percent coverage as a means to avoid closing too many banks in a short period.

The risk of sudden large losses to individual banks or groups of banks is remote and can be further reduced, but it cannot be eliminated. The key to reducing the risk is for institutions to minimize concentrations of exposure to specific events that could cause a sharp drop in their value.

Conclusion

FDICIA has mandated that regulators virtually eliminate deposit insurance losses. The act provides for a systemic exception to its requirement that problem banks must be resolved at the lowest cost to the insurance funds. However, FDICIA also creates some significant political incentives to avoid using the systemic risk exception. Moreover, it is clear from the series of measures to address specific systemic issues that the intent of Congress was virtually to eliminate the practice of the too-big-to-fail doctrine. Congress, having been told that interbank credit created systemic risk, mandated limits on interbank credit. Congress

learned that delayed access to funds could pose a systemic problem, so it authorized the FDIC to use final net settlement. In response to reports that the shock waves from a large bank failure could be amplified through the payments system, Congress made contractual netting agreements binding. Indeed, Carnell (1992) has noted that the original bill passed by the House and the bill introduced to the Senate did not allow for a systemic risk exception to least-cost resolution and that the exception was added after regulators and the Bush Administration asked for the change. The earlier versions of FDICIA relied solely on the Federal Reserve's discount window to address any systemic problems.

Although FDICIA does not ban the too-big-to-fail doctrine, it has substantially reduced the likelihood of future large bank bailouts. Bankers and bank depositors should not casually assume that any given bank would be considered too-big-to-fail. Regulators would be well advised to look for ways to close a large failing bank without protecting uninsured creditors. If conditions were such that a large fraction of the banking system was potentially not viable, regulators may have no choice but to protect uninsured depositors.³¹ However, for most other systemic risk situations, including financial market risk, the potential still exists for identifying and developing solutions. A careful review of FDICIA's provisions makes it clear that Congress is looking for an end to operating under a too-big-to-fail policy and not for more explanations as to why too-big-to-fail treatment is essential.

Notes

1. "Too-big-to-fail" does not literally mean that a bank cannot fail. The shareholders in large banks have lost their investment, and the managers have been fired. A bank is considered too-big-to-fail when it is thought to be too large to close in a way that imposes losses on uninsured depositors and certain other creditors.
2. Large depositors are not protected when a bank is liquidated, but they have frequently been covered when a failed bank has been sold as a part of a purchase and assumption transaction or when the FDIC assumed ownership of the failed organization and operated it as a bridge bank. The FDIC generally has sought to avoid liquidating a bank in order to preserve any franchise value remaining in the organization. However, the FDIC can preserve the franchise value without providing 100 percent coverage to all depositors by transferring only the insured deposits to the successor organization.
3. The act defines a material loss as one exceeding the greater of \$25 million or 2 percent of the institution's total assets, whichever is greater.
4. The exact restrictions on Fed lending are discussed in the section titled "Incentive Changes."
5. Indeed, if a bank is closed by regulatory or market pressure before it wipes out its capital, losses to creditors should be small to nonexistent.
6. Gorton (1988) and Tallman (1988) challenge the view that bank panics caused declines in real economic activity. However, this debate is beyond the scope of this paper. It suffices to note that policymakers in the United States have believed that systemic problems could adversely affect the real economy.
7. One reason for the Federal Reserve to be reluctant to lend to nonbank firms is that, because discount window lending must be fully collateralized, such lending could imperil the

position of the firm's creditors. Thus, if the Fed lends to nonviable nonbank firms it may be transferring wealth away from creditors that cannot or do not withdraw their investment. The Federal Reserve is also not generally in a position to judge the viability of nonbank firms because the agency does not examine and rarely monitors the financial condition of specific nonfinancial firms.

8. For further discussion of the historic operation of the discount window see the Board of Governors of the Federal Reserve System (1985, chap. 4) and Garcia and Plautz (1988).
 9. Calomiris, Hubbard, and Stock (1986) and Gilbert and Kochin (1989) have found that the failure of one or more banks may have negative effects on its regional economy. In Gilbert and Kochin's research the effects are largest in two of the three states in their sample if a bank is closed rather than merged with another institution.
 10. Many provisions of FDICIA, including the general prompt-corrective-action provisions and the definition of material loss, have delayed effective dates or phase-in clauses. This article focuses on the effects of FDICIA after all parts of the act have taken full effect.
 11. FDICIA creates five categories based on capital levels: well-capitalized, adequately capitalized, undercapitalized, significantly undercapitalized, and critically undercapitalized banks. Any bank having a tangible equity-capital-to-total-assets ratio of less than 2 percent is classified as critically undercapitalized. The act also provides that bank regulators may place a bank in receivership or conservatorship on a number of other grounds, including violation of a cease-and-desist order, concealment of records or assets, inability to cover deposit withdrawals, and an undercapitalized bank's failure to develop a plan that would raise its capital or its material noncompliance with a plan to raise capital.
 12. Normal FDIC premiums are calculated on the basis of a bank's total domestic deposits. The expanded premium base provided in FDICIA for emergency assessments will tend to increase the relative proposition of costs borne by banks with foreign deposits and substantial nondeposit liabilities. Because banks with foreign deposits and substantial nondeposit liabilities tend to be larger and to affect the financial system more significantly, the effect of FDICIA may be to shift more of the costs to the banks most likely to receive too-big-to-fail treatment.
 13. A critically undercapitalized bank is not viable according to the definition in the act.
 14. An argument may also be made that the net effect of FDICIA will be to weaken banks. The act will increase the number of regulatory requirements imposed on banks (including some requirements such as Truth in Savings that are unrelated to bank safety) and will also increase bank reporting requirements. It does nothing to enhance banks' ability to compete with nonbank financial firms, which continue to take market share in many of the bank's most profitable markets while remaining free from most of the costly safety and consumer regulations imposed on banks. Moreover, the act was passed in an environment in which deposit insurance premiums had been substantially increased on healthy banks to rebuild the insurance fund.
- This argument that FDICIA will weaken banks has some merit but probably misjudges the impact of what is and is not in the act. FDICIA probably will strengthen the financial condition of individual banks and reduce the risk of bank failures that impose significant costs on the banking system. Banks that cannot strengthen their financial position will likely be forced to merge. Instead, the effect of higher regulatory costs will be that banks will continue to concede market share to nonbank firms in markets in which the law has made banks less competitive.
15. No losses need occur if a bank is closed before its losses become too large. However, closing a bank before its capital reaches zero does not guarantee that losses will be avoided unless bank assets are valued at liquidation prices. See Berger, King, and O'Brien (1991) for a discussion of the alternative definitions of "market value" and their limitations.
 16. See the press release from the Board of Governors of the Federal Reserve System dated July 14, 1992, Docket No. R-0769.
 17. The regulation on interbank liabilities uses a definition of "adequately capitalized" that is similar but not identical to that used to fulfill the prompt-corrective-action sections of FDICIA.
 18. The only case in which the failure of one bank could cause insolvency at other banks would be that of a well-capitalized bank failing suddenly and its remaining assets providing creditors with a low recovery rate. These unexpected losses would have to be massive under the currently proposed capital requirements for prompt corrective action because a well-capitalized bank must maintain a total capital-to-risk-assets ratio of at least 10 percent.
 19. The limits on interbank credit extension may not be effective at preventing insolvency if a group of related banks fail. For example, if a set of international banks from a foreign country were ordered by its government to stop payments, limits on exposure to any single bank might not be effective.
 20. See Holland (1992) for a discussion of some of the risks in the swaps market. That analysis focuses on the credit risks posed by the interbank market for swaps. However, the issues raised by interbank credit exposure to swaps are not fundamentally different from the issues raised by other types of interbank credit exposure.
 21. For a general discussion of the risks posed by over-the-counter derivatives to banking organizations see Hansell and Muehring (1992).
 22. See Shirreff (1991) and Torres (1991) for discussion of some of the problems encountered in unwinding the derivatives books of some large financial firms. Shirreff (1992) discusses some of the regulators' general concerns about the swap market.
 23. For example, consider an interest rate swap with a notional principal of \$100 million. One party agrees to pay a fixed rate of 8 percent and the other party agrees to pay the London interbank offered rate (LIBOR) for five years. The \$100 million notional principal will never change hands. The party that owes the larger interest payment will pay an amount to the other party equal to the absolute value of LIBOR minus 8 percent.

24. Further, many master derivatives contracts between two parties provide for netting across contracts so that gains on one contract may be offset by losses on other contracts.
25. See Wall, Pringle, and McNulty (1990) for a discussion of the (credit) risk-based capital guidelines as applied to over-the-counter interest rate and foreign exchange derivatives.
26. This issue may require some sensitivity on the part of the FDIC to the needs of the bank's counterparties. For example, the FDIC ordinarily likes to close a bank on a Friday after the U.S. financial markets close. If all over-the-counter derivatives are terminated at this point, those users that lack access to foreign markets may have problems arranging substitute hedges before Monday morning and would therefore be exposed to any changes in market prices during the weekend. A possible solution would be for swap contracts to provide that if a bank should fail at the start of a weekend the contract would be terminated at a fixed time on Monday morning and the remaining obligations of the two parties would be based on market prices at the time of termination. The FDIC may have to agree to this arrangement. The one risk in such an arrangement would be that some dealers may try to manipulate market prices around the termination time, but doing so is likely to be difficult in a market with a large number of users trying to arrange substitute hedges.
27. Many derivatives products involve two-sided credit risk. If a user's credit quality has deteriorated sufficiently, dealers may not be willing to take the credit risk ordinarily involved with products like forward contracts and swaps. Some derivatives contracts contain clauses to protect the parties against material adverse changes in the financial condition of their counterparties, and such contracts would force the parties to recognize deterioration in the user's condition prior to its failure. However, financially weakened users may need to provide additional protection to the dealer in order to reestablish their hedge if the derivatives contract contains no such clause. For example, rather than using an ordinary interest rate swap without collateral to protect against an increase in market interest rates, the user may be required to post collateral with the dealer or buy an interest rate cap.
28. Virtually all dealers impose a limit on their maximum credit to any given counterparty. The limit is established according to the counterparty's size and financial strength. The maximum exposure limits aggregate exposure from all types of credit risk, including any loans. See Arak, Goodman, and Rones (1986) for an example of ways a dealer could calculate its credit exposure on an interest rate swap and Chew (1992) for a recent discussion of a banks' management of derivatives credit risk.
29. The clientele of some dealers tends to be weighted toward one side of the derivatives market. For example, the customer bases of some commercial banks may be weighted toward firms that wish to pay a fixed rate of interest on their interest rate swaps. The bank ends up having a concentration of floating rate contracts. One common way for these commercial banks to hedge their transactions is to arrange offsetting swaps in which the bank pays a fixed rate with a dealer that has a different clientele. If credit lines became exhausted in the interdealer market, dealers could have more problems hedging deals with their natural clientele and, thus, be less willing to offer over-the-counter derivatives to their usual customers.
30. Financially weak banks may handicap trading operations in a number of ways. Their presence may bring the general credibility of the trading operations into question with customers.
31. The policy mistakes, if any, that led to the questionable viability of a large fraction of the banking system would have occurred prior to any decision to exercise the systemic risk exception.

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