

Supervising Bank Safety and Soundness: Some Open Issues

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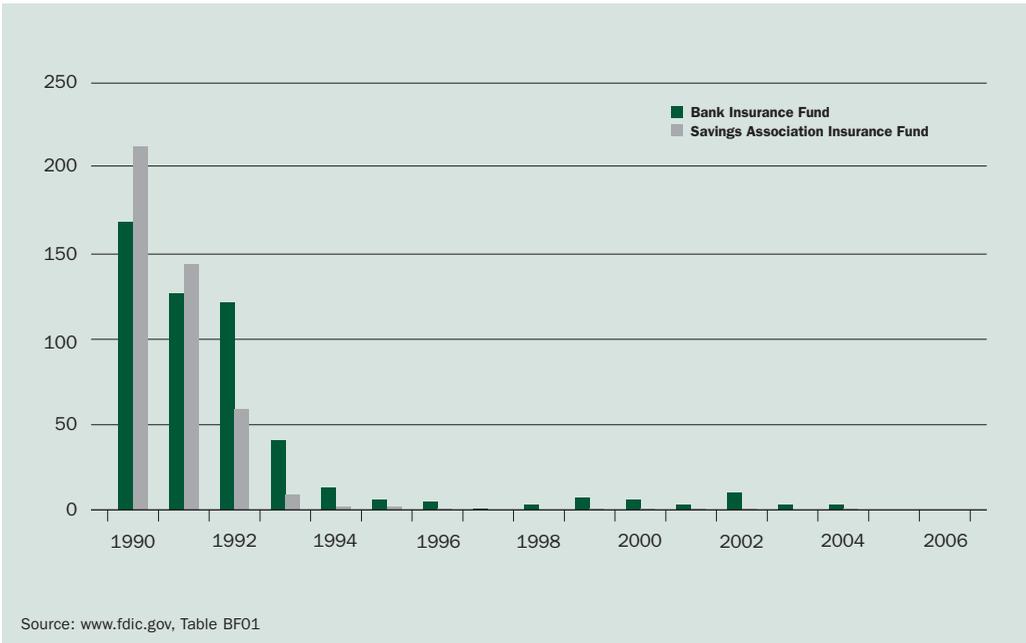
Banking is now, and has always been, a risk business. The key to success both in operating a bank and supervising a banking system is management of risk.

—Benston et al. (1986, xiii)

In response to a relatively specific request from the American Bankers Association, Benston et al. (1986) examined the mid-1980s financial landscape. As Furlong and Kwan (2007) report, *Perspectives on Safe and Sound Banking* presented a wide-ranging and innovative discussion of policy issues related to government supervision of bank safety and soundness. Among other topics, the report evaluated risk-based insurance premia, resolution methods for failed banks, capital against off-balance-sheet positions, and prompt corrective action. For this conference, I was asked to write a paper surveying the main issues affecting the contemporary financial system's safety and soundness. I have sought to identify underresearched and/or underappreciated issues that affect bank safety and soundness or financial system stability. It is a great luxury to write a paper that poses questions but is not required to provide complete answers!

Obviously, the U.S. financial sector's condition today is excellent. Capital ratios stand at levels we have not seen in sixty years, credit quality has been strong, and innovative financial instruments can spread risks more broadly than ever before. We have had 954 bank or thrift failures since 1990 (519 charged against the Bank Insurance Fund [BIF] and 435 by the Savings Association Insurance Fund [SAIF]). The combination of weak financial policies and macroeconomic shocks culminated in 834 bank or thrift failures between 1990 and 1992 (see Figure 1). Since 1992, only 120 institutions (101 BIF institutions and 19 SAIF institutions) have failed, the largest having assets of only \$3.8 billion at the time it was closed. This record largely reflects the economy's strong performance since the 1991 recession (as predicted by Schwartz 1988). Supervisory reforms also deserve substantial credit, particularly those aimed at raising bank equity ratios.

Figure 1
Number of Bank and Thrift Failures, 1990–2006

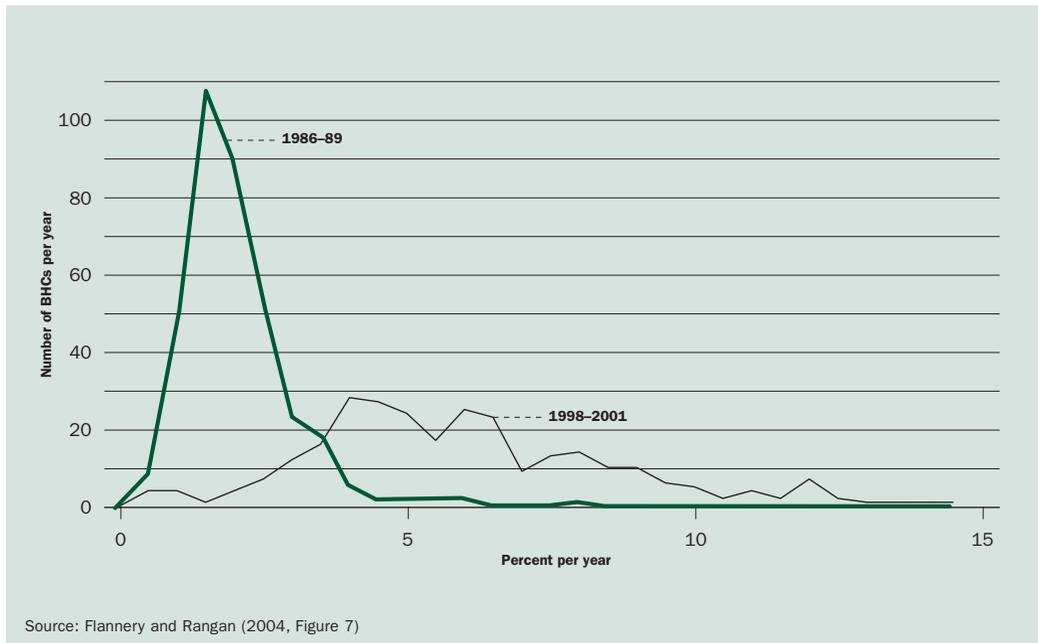


Bank powers expanded substantially during the 1990s. The mean asset volatility of the 100 largest bank holding companies (BHCs) rose from 1.76 percent during the 1986–89 period to 6.09 percent during the 1998–2001 period.¹ As shown in Figure 2, asset volatilities also became more cross-sectionally dispersed. *Ceteris paribus*, higher asset volatilities imply more bank default risk, but supervisors were simultaneously inducing banks to raise their equity capital ratios, as shown in Figure 3. The net effect is a broader range of asset risks and leverage ratios, which tend to complement one another and yield little net change in the typical institution’s default probability. In addition to enforcing explicit capital standards, supervisors wielded a new threat well known to readers of *Safe and Sound Banking*—prompt corrective action.

Bank safety further benefited from complex, new financial instruments for diversifying and hedging risks. Bank-related financial contracts are more refined and trade more actively than they did twenty years ago. At the same time, some of these market advances have added new potential exposures and (perhaps) have enhanced institutional opacity. Contracts traded over the counter (swaps and other derivatives) may bundle counterparty credit risks with the effects of the trade. As trading became concentrated in a small number of key institutions, the banking system acquired a new potential source of undiversified credit risk. Over time, contract terms have moved to mitigate this risk through collateralization, periodic mark-to-market settlements, and netting agreements. However, the process is far from complete (Federal Reserve Bank of New York 2006), and many of the new contract arrangements have not been tested in a stressful environment.

This paper begins by discussing the goals of safety and soundness supervision. I then discuss seven imperfectly understood issues related to financial stability today. Some are closely related to one another; all deserve serious scholarly attention. These issues are

Figure 2
Distribution of One Hundred Largest Bank Holding Companies' Asset Volatility



1. credit rating agencies,
2. the combination of banking and commerce,
3. nationwide depositor preference and the distribution of liability holders' risk exposures,
4. systemic risk,
5. capital adequacy,
6. market discipline, and
7. credible resolution procedures for the failure of large financial firms.

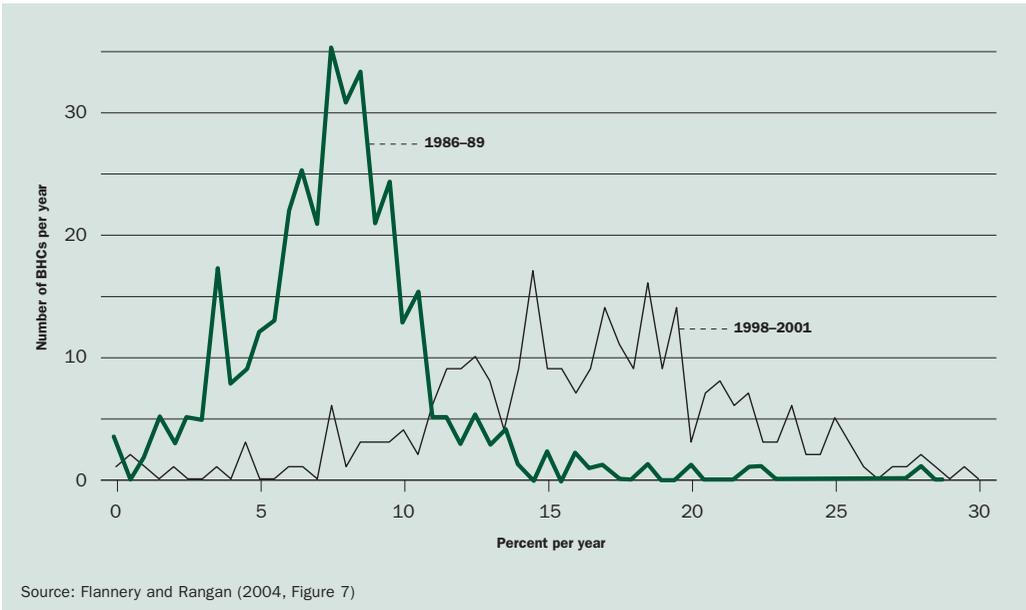
The paper concludes with a brief summary.

Safety and Soundness Supervision

For a long time, banking has involved unusual contracting terms. Recall the unlimited liability of Scottish bank directors in the eighteenth and nineteenth centuries and national bank shareholders' liability before mid-1937. Financial firms have also been more highly regulated than (perhaps) any other industry. Existing controls over bank risk basically concern minimum capital requirements, although limitations on bank activities could also be viewed in the same context. Why are banks so highly regulated? The literature suggests several reasons, reflecting primarily efficient information production or distorted risk-taking incentives:

1. The idea that broader powers should reduce bank asset volatilities was popular in the 1980s. As things have worked out, however, Stiroh (2004, 2006) and DeYoung and Roland (2001) show that many of the new activities are high risk on their own, with returns that are quite highly correlated with banks' traditional lines of business.

Figure 3
Distribution of One Hundred Largest Bank Holding Companies' Market-Valued Equity Ratios



Source: Flannery and Rangan (2004, Figure 7)

1. Using a single credit analyst (the insurance fund) to evaluate a bank's condition is less costly than for each depositor to do it on her own.²
2. Insurance provides a safe asset for unsophisticated investors and will reduce the number of costly bank failures caused by irrational runs.³

Another justification for safety and soundness regulation derives from a distortion associated with deposit insurance:

3. Given underpriced deposit insurance, bank owners face distorted incentives to increase asset risk and leverage.

Finally, there is a systemic risk justification for government control over financial firms:

4. Bank failures impose external costs on uninvolved parties. Hence the social cost of a bank's failure exceeds its (internalized) private costs.

Safety and soundness regulation primarily addresses the last two of these issues, the deposit insurance distortion and systemic risk. Thus, the basis for safety and soundness supervision derives from some market failure. Left to themselves, banks would accept too large a default probability, so supervisors design constraints to increase bank safety. Unless those constraints are binding, the supervision is ineffectual. This point is crucial to remember when discussing supervisory policies related to financial stability.

The next question is whether financial stability—a public good—requires more than sound individual banks. Many observers feel that a financial crisis begins when a systemically important bank's creditworthiness is questioned. Regardless of whether the bank fails, the initial problem somehow threatens other institutions.⁴ Perhaps (as in the

case of Continental Illinois) other banks hold large, undiversified exposures in on-book liabilities. More likely today, the undiversified exposures occur in the foreign exchange or derivatives trading market, where a few firms dominate over-the-counter (OTC) trading. The failure of one such firm would therefore affect the trading ability (and hence the hedging ability) of other agents. The concept of a financial crisis goes beyond sound individual banks even if “sound” is defined as operating with a socially appropriate default probability. Ex ante, the bank’s risk exposure could be socially appropriate, but ex post bad luck can still cause a failure that would have worrisome knock-on effects.

Supervisory and private actions have reduced the risks posed by OTC settlement over time. In the early 1980s, banks recognized that payment system risks were not simply operational issues. The Federal Reserve subsequently took steps to reduce daylight overdrafts on Fedwire, and banks began to manage their payments more carefully. Herstatt (settlement) risk was addressed through the privately owned, but publicly encouraged, CLS Bank. Recently, the Federal Reserve commissioned an industry group to develop a new mechanism for limiting the OTC trading system’s spillover effects. NewBank is proposed to handle settlements and to wind up a large trading book when its owner becomes financially questioned (Working Group on NewBank Implementation 2005). In March 2006, the largest credit-default swap traders promised the New York Fed that they would increase the reliability of their delivery and settlement systems (Federal Reserve Bank of New York 2006).

Many central banks have established financial stability institutes to monitor the extent to which market shocks might require central bank intervention to stabilize the economy. As long as such interventions do not take the form of bailing out bank creditors or shareholders, they will not interfere with ex ante safety and soundness. The danger is that bailouts will be the most expeditious choice, which reduces counterparties’ incentives to monitor large, systemically important institutions. Because these institutions are extremely difficult for a supervisor to control and evaluate (I will argue below), this possibility is a problem. A related concern is that the staff of a financial stability institute may develop a tendency to see systemic risks in too many places, and hence the central bank may “overtreat” the problem of systemic risk by overreacting to false positive indicators.

During the 1990s, U.S. supervisors appeared to become more comfortable with the notion that even relatively large bank failures could be resolved without systemic implications. This development is good, but it has not been tested under stress. However, European supervisors appear more likely to view even moderately large institutions as systemically important. In Japan, supervisors have given the clear impression that they consider a large bank failure to be inconsistent with financial system stability.

I will now discuss specific issues related to financial stability, beginning with the relatively easy ones.

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2. For example, Merton (1977) reasons that deposit insurance reflects a social cost savings: “For the small depositor particularly, there are large information and surveillance costs to be saved if the institutional structure of the bank were such that the safety of the deposits was assured. . . . A sensible alternative choice would be to have third-party guarantees where the capability and willingness of that party to meet its obligations are beyond question. For the scale of the banking system, this almost certainly means that the third party would be the government or one of its agencies” (1977, 3–4).
 3. The “runs” argument for deposit insurance resembles the case for Chapter 11 bankruptcy, which prevents creditors from “running” on the firm’s assets and destroying some of its synergies in the process.
 4. The “domino effect” is a frequent analogy, although it does not seem to make the definition of systemic risk more tangible or specific.

Rating Agencies

Nationally recognized statistical rating organizations (NRSROs) are recognized (created) by the Securities and Exchange Commission (SEC), which relies on their opinions for controlling brokers' risk taking. Beginning in 1975, the SEC set haircuts for margin requirements on the basis of bond ratings. In the 1980s, money market mutual funds (MMMFs) were required to hold at least 80 percent of their assets in top-rated paper if they wanted to use dollar-rounding. (This requirement was changed to 95 percent in 1991.) Investment-grade bonds are eligible for short-form registration statements. Other regulators have also come to rely on rating agency opinions. The National Association of Insurance Commissioners (NAIC) sets insurance companies' required capital levels according to their bond investments' credit ratings. The Financial Institutions Reform and Recovery Act (FIRREA) required that thrift institutions divest all their junk bonds by July 1, 1994.⁵ Aside from government regulations, many mutual funds establish their investment strategies in terms of minimum bond ratings they will hold in portfolio. As the asset-backed securitization market has evolved, the rating agencies have acquired a new task: designing securities to meet specific rating goals. Rating considerations largely determine the structure of asset-backed securitization issues, which have grown immensely over the past two decades. In short, NRSROs importantly affect portfolio allocations within the private sector.

This influence is due to increase (White 2002). The Basel II framework for capital adequacy bases risk weights on NRSRO bond ratings under the standardized approach (to be used abroad) and for securitization tranches under the internal-ratings-based (IRB) rules. The current Federal Deposit Insurance Corporation (FDIC) proposal for risk-based insurance premia also incorporates large insured institutions' public debt ratings (FDIC 2006, 36). Delegating credit evaluation to a private firm amounts to supervisory outsourcing, apparently based on the idea that the rating agencies provide better default risk assessments than examiners could. (Basel II does a lot of outsourcing.)

What do we know about the credit-rating industry? Historically, the bond-rating business was a duopoly, and some observers have identified abuses of market power, including the following:

- requesting payment for unsolicited ratings,
- tying ratings to the purchase of other services from the rating agency (for example, consulting), and
- reducing a rating or refusing to rate a pool of assets (for example, in a collateralized debt obligation) unless a substantial proportion of the pool's individual securities are already rated by the same agency (Kupiec 2006b).

Recently, Congress has taken an interest in the ratings industry. The House of Representatives passed HR 2990 on July 12, 2006, and the Senate Banking Committee approved a similar bipartisan credit rating agency reform bill on August 2, 2006. The SEC has also eased rules for recognizing new NRSROs.

The conventional wisdom on Wall Street is that the rating agencies are generally slow to downgrade firms (for example, Washington State Municipal Power Authority, Executive Life Insurance, Enron, or Worldcom).⁶ For many years, the academic literature could detect no significant valuation effect of a rating change. An analysis of daily data (Hand, Holthausen, and Leftwich 1992) indicated that rating downgrades affect share prices but upgrades do not. In other words, ratings convey new negative information about firms, but the information reflected in a rating upgrade was already impounded in equity prices (probably because managers publicize good news more

widely on their own). Jorion, Liu, and Shi (2005) observe that regulation FD limited the availability of inside information to investors but not to NRSROs. The authors find that rating changes cause larger stock price movements after Reg FD than before.

Supervisors should base their decisions on the rating agencies' credit opinions only if those opinions are unbiased and relatively accurate. However, the rating agencies were not initially designed to play a role in supervising firms. In 1995, one industry observer told the SEC that by

using securities ratings as a tool of regulation, governments *fundamentally change the nature of the product* agencies sell. Issuers pay ratings fees to purchase . . . a license from the government . . . if present trends of regulatory use of ratings are not arrested, the *credibility and integrity of the ratings system itself will inevitably be eroded*. (McGuire 1995, as quoted in a 1998 Investment Company Institute comment letter; italics added for emphasis)

To assert simply that credit-rating agencies can be trusted because they have a valuable reputation to protect seems naive. Remember how the auditing and stock analyst industries have collapsed upon themselves in recent years.

So my first topic for further study is the credit-rating agencies. If the first two debt ratings disagree, Basel II specifies lower capital standards for securities with a higher, third rating. How accurate are these third assessments in the context of risk supervision? How will the SEC's recently liberalized rules for certifying NRSROs affect the operation of old and new rating agencies? Third ratings are generally higher than the first two, perhaps because of sample self-selection. Will ratings shopping importantly impair the accuracy of Basel II capital standards? Does a supervisory focus on default probabilities (ratings) draw attention away from the stability effects of asset default correlations?

Banking and Commerce

Wal-Mart's recent application for an industrial loan company (ILC) charter raises many hot button issues, only some of which follow from economic principles. But the most important facet of this application has received insufficient public attention from policymakers: Should banking and commerce be permitted to operate out of the same firm? This policy question is not new, nor will it disappear during the FDIC's six-month moratorium on granting ILC insurance certificates. Today's relatively broad powers for bank holding companies were granted piecemeal, in response to specific applications from individual firms. This piecemeal approach will likely remain policymakers' *modus operandi*.

The Gramm-Leach-Bliley (GLB) Act increased the potential for firms to combine banking and commerce. Federal Reserve Governor Meyer (2001) testified before Congress on the permissibility of real estate brokerage and property management.⁷

5. The Comptroller of the Currency had issued a similar rule for national banks in February 1936 (Partnoy 1999, 688).

6. Moody's chairman, Clifford Alexander, sat on the Worldcom board until June 2001. The company's bankruptcy occurred in July 2002. Worldcom was rated investment grade three months before it filed for bankruptcy.

7. In late 2000, several organizations requested that the Federal Reserve and the secretary of the Treasury determine that real estate brokerage and property management are financial activities. If so classified, these two business lines would be open to financial services holding companies or subsidiaries of national banks. The agencies requested public comments between January 3 and May 1, 2001.

Table 1
Proposed FDIC Risk Categories for Pricing Deposit Insurance

	Weighted CAMELS rating		
	1-2	3	4-5
Well capitalized	I (2-4 bps)	II (7 bps)	III (25 bps)
Well capitalized	II (7 bps)	II (7 bps)	III (25 bps)
Undercapitalized	III (25 bps)	III (25 bps)	IV (40 bps)

Note: The six CAMELS ratings (see footnote 9) would be weighted as follows: 25 percent, C; 20 percent, A; 25 percent, M; 10 percent, E; 10 percent, L; and 10 percent, S (FDIC 2006, 34).

Source: FDIC (2006, Table 4 and p. 62)

He explained that GLB provides “a significant expansion of the Board’s capacity to consider the competitive realities of the U.S. financial marketplace in determining the permissibility of activities for FHCs [financial holding companies]” (FRB-OCC 2000). While the Bank Holding Company Act had permitted activities “closely related to banking,” GLB allows the Federal Reserve and the Treasury to approve activities that are “financial in nature or incidental to a financial activity” (Meyer 2001).⁸ Specifically approved activities in GLB include “lending; insurance underwriting and agency; providing financial advice; securities brokerage, underwriting, and dealing; and merchant banking activities” (Meyer 2001).

Instead of dealing sequentially with each piecemeal application for a new permissible activity, the banking agencies (and Congress) should get ahead of the trend by developing a sound understanding of how various connections between commerce and banking likely affect social welfare. From the 1980s and early 1990s, we all know the arguments about insulating the commercial bank from nonbank subsidiaries within a holding company (for example, firewalls or Sections 23A and B). This tactic is probably the wrong way to proceed. Benston et al. (1986) maintained that risk cannot be contained within a holding company subsidiary. Holding companies clearly act to manage total profitability across all their product lines, regardless of which subsidiary is providing the product. We need a fresh way to think about the competitive and stability implications of combining banking and commerce.

Risk-Based Insurance Premia and Depositor Preference

Benston et al. (1986) argued that deposit insurance premia should be based on risk to the insurance fund, and FDIC staff have long been sympathetic to this notion. The first system of risk-based insurance premia emerged in 1995, just in time for the insurance fund’s size to preclude explicit premia for the majority of U.S. banks. The Federal Deposit Insurance (FDI) Reform Act of 2005 substantially broadens the FDIC’s discretion over structuring deposit insurance premia and the insurance fund. On July 11, 2006, the agency sought comments on their proposed new system for setting individual banks’ premia. The FDI Reform Act required a new pricing system within 270 days, and observers will surely criticize the proposed plan.

Figure 4
Uninsured Liabilities as a Proportion of Domestic Deposits



FDIC views the proposal as a first step that will be revised as new information becomes available.

The FDIC's proposed method for pricing deposit insurance would replace its current system of nine insurance risk classes with the four risk categories (numbered I through IV) in Table 1. These proposed categories are based on a weighted average of the six CAMELS rating components (across the columns) and the bank's capital ratio (down the rows).⁹ All banks within risk category II will pay 7 basis points, all banks in category III will pay 25 basis points, and all banks in category IV will pay 40 basis points. About 95 percent of all banks are presently in risk category I, for which the FDIC proposes to vary the premium (between 2 and 4 basis points) according to the bank's apparent risk.

It is surprising that the FDIC's risk categories are based on equity capital and not on the sum of all the bank claims junior to insured deposits. The National Depositor Preference Act of 1993 makes both uninsured (nondeposit) liabilities and equity claims junior to deposits.¹⁰ For some firms, nondeposit liabilities are quite substantial. The top line in Figure 4 illustrates that aggregate uninsured (nondeposit) liabilities expanded over the past three decades, from about 8 percent of total deposits at large U.S. domestic banks in 1973 to about 30 percent at midyear 2006. Subordinating nondeposit liabilities has the apparent effect of making deposit claims more secure (low loss given default [LGD], whatever the probability of default). However, collateralizing

8. The Federal Reserve appeared inclined to permit brokerage, but extraordinary opposition from the real estate lobby prevented a final decision from being made.

9. The CAMELS system rates banks on six factors: capital adequacy, asset quality, management quality, earnings, liquidity, and sensitivity to market risk.

10. The National Depositor Preference Act was passed as Section 3001 of the Omnibus Budget Reconciliation Act of 1993.

these liabilities can more than offset the LGD effect on deposit claims. The net effect of these uninsured liabilities on fair deposit insurance premia depends importantly on the collateral pledged against uninsured liabilities. The FDIC proposal almost entirely ignores this issue.¹¹

The Call Reports and monthly Schedule 2416 provide little detail about the nature of domestic bank “borrowings,” which are divided simply into those from commercial banks in the United States (including U.S. branches and agencies of foreign banks) and those from others (including Federal Reserve Bank and FHLB borrowings).

The lower two lines in Figure 4 describe the components of banks’ nondeposit borrowing. Interbank borrowings have not changed much over the period; most of these borrowings are probably unsecured.¹² Rapid liability growth has come from “other” (nonbank) borrowings that include loans from the Fed, the FHLBs, and all other lenders. In 1973 these borrowings constituted roughly 3 percent of total domestic deposits; by 2006 this proportion stood at nearly 25 percent. Advances from the Federal Reserve and the FHLBs are fully collateralized. (Indeed, the FHLBs require a blanket lien on a borrowing institution’s assets in addition to a specific lien on pledged assets.¹³) The quantity of FHLB advances is explicitly reported on Call Reports, but we do not know whether the remainder is secured, and therefore de facto senior to deposit claims, or unsecured and therefore de facto junior.¹⁴

This issue requires further study and additional information gathering since the FDIC cannot assess appropriate deposit insurance premia without understanding the true seniority of the deposits they guarantee.¹⁵ The FDIC is insuring two very different sets of institution: a large number of small firms, to which normal insurance principles roughly apply, and a small number of very large banks whose failure could tie up the entire insurance fund. Financial system stability may also depend more on the solvency of large banks than of small ones. The FDI Reform Act explicitly permits, for the first time, separate methods for determining the risks of small versus large banks. Because a sufficiently large bank’s failure might also pose systemic risks to the financial system, setting accurate premia for the larger banks is much more important.

For risk category I institutions with assets below \$10 billion, “the FDIC proposes to combine CAMELS component ratings with current financial ratios to determine an institution’s assessment rate” (FDIC 2006, 6). For larger institutions in risk category 1, “the FDIC proposes to combine CAMELS component ratings with long-term debt issuer ratings, and, for some large institutions, financial ratios” (p. 6). Table 2 shows how the weighting scheme for various information varies with bank asset size. Beyond the items in Table 2, the FDIC’s NPR expresses the possibility that a wide range of relevant market information might also affect the premium paid by large, risk category I institutions:

In addition to long-term debt issuer ratings, the FDIC proposes to consider other market information, such as subordinated debt prices, spreads observed on credit default swaps related to an institution’s non-deposit obligations, equity price volatility observed on an institution’s parent company stock, and debt rating agency “watch list” notices. These additional market indicators would be especially beneficial in assessing whether the insurance score accurately reflected the relative level of risk posed by an institution. (FDIC 2006, 46–47)

Although this language permits analysts to use a broad range of information in setting insurance premia, its generality may also shield FDIC analysts from transparent accountability. (This balance is difficult to establish throughout the field of financial regulation.)

Table 2
Weights under the Proposed Approach

Asset size category ^a	Weights (in percent) applied to the		
	Weighted average CAMELS component rating	Converted long-term debt issuer ratings	Financial ratio factor
>= \$30 billion	50	50	0
>= \$25 billion, < \$30 billion	50	40	10
>= \$20 billion, < \$25 billion	50	30	20
>= \$15 billion, < \$20 billion	50	20	30
>= \$10 billion, < \$15 billion	50	10	40
No long-term debt issuer rating	50	0	50

^a The asset size category is applicable when a current (within the past twelve months) long-term debt issuer rating is available for the insured institution. If no current rating is available, the last row of the table applies.

Source: FDIC (2006, Table 14, p. 39)

The FDI Reform Act required that risk-based insurance pricing be implemented within 270 days, and this is the FDIC's first attempt at a broad reform. Despite FIRREA's treatment of bank equity within a holding company, the FDIC evaluates its risk exposure at the bank level. For the first time, U.S. banks prospectively operate under both risk-based capital requirements and risk-based insurance premia. A careful evaluation of this proposed pricing scheme would surely be among my requests for another *Safe and Sound Banking* study. In this sense, little has changed since 1986 except that we have moved from academic arguments for risk-based insurance to a specific proposal from the deposit insurance agency.

Defining Systemic Risk

As the number of "financial stability institutes" has grown around the world, so have the number of articles and policy papers evaluating the government task of preserving financial stability. Early research viewed instability as resulting primarily from undiversified interbank credit exposures (as in the case of extensive fed fund borrowings by Continental Illinois). More recently, concern about depositor runs has (appropriately) expanded to include the credit exposures of OTC trading counterparties and a more general assertion that the failure of a large financial firm could have unspecified

11. The FDIC's proposal asks whether it should treat Federal Home Loan Bank (FHLB) advances as "volatile liabilities," which would tend to raise a bank's insurance premium. Advances should probably raise insurance premia, but because of their effect on LGD, not because they are a volatile source of funds.
12. For the first time, the September 30, 2006, Call Report includes a new item asking specifically what amount of fed fund liabilities and "other" (non-FHLB) borrowings are explicitly collateralized (draft of 9/30/06 Form FFIEC031, Memorandum RC-M, items 10.a and 10.b).
13. This blanket lien is senior to all other claimants, including those of the FDIC.
14. Recall further that some bank assets may be pledged in connection with OTC derivatives transactions.
15. Adler (2006) notes that the FDIC, on page 67 of its 152-page Notice of Proposed Rulemaking (NPR) (2006), "asked whether Home Loan Bank advances should be treated as 'volatile liabilities,' or whether it should charge 'higher assessment rates to institutions that have significant amounts of secured liabilities.' Both ideas would effectively raise premium rates for banks with Home Loan bank advances." Small banks were substantially upset at this possibility.

systemic effects. (Think of a large hedge fund, whose positions could not be unwound without substantially distorting asset market prices.) Large banking firms in particular are often identified as systemically important, although the mechanical processes for systemic effects are rarely explained (except see DeBandt and Hartmann 2000). Everyone knows that financial instability would be bad, yet few people know what it is or how important its effects on the real economy could be.

As I will emphasize again later, sound crisis-management policy requires a solid understanding of how (whether) one firm's financial distress might spread across the financial system. Simply establishing some definitions and examples that could inform research in this potentially important area would be a valuable start.

Capital Adequacy Regulation

Recall the economic basis for imposing minimum capital requirements on financial firms: Some costs of risk taking are external to the firm's shareholders. Supervisors therefore require bankers to hold more equity capital than they would otherwise choose to hold.

The Basel Committee on Bank Supervision (BCBS) has recently completed a system intended to make each bank's equity account reflect its total risk taking. The system includes three distinct approaches, designed for different sorts of banks. The target default probability is said to be 0.1 percent per year. The standard approach most closely resembles the Basel I rules except that credit ratings play a greater role in defining risk assets. The other two approaches rely on a bank's own internal ratings in a highly structured fashion. Many rules and cases are identified in the effort to minimize the potential for regulatory arbitrage. Indeed, the pillar 1 rules (for computing risk-based assets) take up 192 pages in the latest presentation of Basel II (BCBS 2006), while pillars 2 and 3 together get only thirty-nine pages.

Some have questioned whether, even in theory, the value-at-risk calculations underlying pillar 1 are what they seem to be. Kupiec (2006a) points out that the Basel II formulas do not recognize the accrual of interest on a bank's liabilities. Consequently,

the AIRB [advanced IRB] approach will undercapitalize portfolio credit risk relative to the Basel II target of 99.9 percent bank solvency, and capital shortfalls can be substantial. In contrast, the Foundation Internal Ratings Based (FIRB) approach allocates significantly more capital than necessary to achieve the supervisory objective. (Kupiec 2006a, abstract)

Even if the pillar 1 formulas did perfectly measure credit risks, BCBS did not address important questions about the efficacy and effects of supervisory capital standards. For example, Hancock et al. (2005) argue that capital requirements can never bind private firms.¹⁶ Specifically, they claim that small U.S. banks' higher capital requirement for low-risk mortgages should not hamper their ability to compete with larger, AIRB banks. The small banks simply need to raise their average credit risk exposures to the point where economic and regulatory capital coincide. At least for banks operating under the standard (or Basel I) rules, the implication is that banks can strategically make loans whose true risks exceed those implied by the asset's regulatory risk weight. Higher required capital ratios need not reduce default probabilities.

Basel II was designed with the primary goal of making capital requirements reflect bank risk exposures. More credit risk would require an appropriate amount of additional capital to keep the bank's default probability at approximately 0.1 percent per year. QIS (quantitative impact study) 4 in the United States and QIS 5 in Europe

indicated that the AIRB standard will be considerably lower than Basel I's 8 percent of risk assets. This standard is clearly unacceptable to (at least) the U.S. supervisors. The federal agencies' Advanced Notice of Proposed Rulemaking (68 FR, August 4, 2003, 45900, 45902) stated that "the Agencies do not expect the implementation of the New Accord to result in a significant decrease in aggregate capital requirements for the U.S. banking system." In the same agencies' draft NPR (March 30, 2006, 83) subsequent to QIS 4, we read the following:

Were the QIS-4 results just described produced under an up-and-running risk-based capital regime, the risk-based capital requirements generated under the framework would not meet the objectives described in the ANPR, and thus would be considered unacceptable.

The proposed solution involves pillar 2, under which national supervisors set additional required equity beyond the minimum computed in pillar 1. By necessity, the justification for pillar 2 add-ons will be qualitative and opaque—in stark contrast to the scientific-looking justifications for pillar 1 supervisors could quite reasonably require capital beyond the pillar 1 formula for interest rate risk, foreign exchange risk, trading risk, granularity in the credit portfolio, etc.¹⁷ However, an opaque policy of adding on further required capital to the pillar 1 minimum, simply to maintain an arbitrary and historic 8 percent ratio, would be quite dubious public policy. It would also mute (or eliminate) the risk sensitivity of required capital.

Another threat to the risk sensitivity of the Basel II formulas comes from the U.S. insistence that a straight leverage requirement supplement the AIRB measures. This leverage ratio will be the binding constraint for firms holding low-credit-risk loans, leaving no risk sensitivity at the margin.

Finally, banking systems in most Organisation for Economic Co-operation and Development countries presently maintain more capital than is required by Basel I. Basel II standards are expected to be no higher. In what sense, then, do supervisory capital standards bind or affect private firms' capital choices? Perhaps banks maintain a cushion above current requirements, and their actual capital will move up or down with the required minimum.¹⁸ Perhaps the capital surplus is intended to be cyclical: As the economy heads into recession, credit quality declines and more equity becomes required.¹⁹ We have not previously confronted a situation in which large banks hold substantially more capital than the supervisors would require.

My questions for a second *Safe and Sound Banking* study would surely include numerous inquiries about capital adequacy, such as

1. How do risk-based capital and risk-based insurance premia complement one another?
2. Are capital ratios currently binding on the world's major banks? If not, why not?

16. Kahane (1977) presented a similar assertion. Using mean-variance analysis, he showed that imposing a higher capital standard would cause a firm to move along its efficient frontier toward higher risk. The net effect on the firm's default probability was therefore ambiguous.

17. Pillar 1 includes a specific requirement for operational risk and permits (but does not require) a supervisor to require capital against interest rate risk in the banking book.

18. This cushion would be rational under some information asymmetries (Myers and Majluf 1984 or Stein 1998) that make it expensive to sell new equity at some times.

19. This view does not explain why it is cheaper to hold excess capital over the cycle than to raise new capital as credit conditions soften. More attention should be paid to this question for banking firms.

3. Is it reasonable to establish prompt corrective action guidelines in market value terms for sufficiently large firms?
4. What does it mean for capital requirements to “bind”? Is this a probabilistic statement, or are the requirements meant to constrain firm lending only during recessions?
5. How relevant is the Hancock et al. argument that capital ratios cannot be binding for smaller, “standard approach” banks or for larger, AIRB banks?
6. How should pillar 2 be administered? Can supervisors be held accountable for their decisions in this area?
7. Is the leverage requirement a good idea in theory? In practice?
8. Would implementation of a bifurcated capital standard in the United States encourage otherwise uneconomic mergers within the finance sector?
9. Should the United States abandon its proposed transition to an AIRB capital standard for large, internationally active banking firms?

Market Discipline

Dewatripont and Tirole (1994) approached bank regulation from the perspective that free riding prevents a diverse group of depositors from controlling bank actions. In contrast, a regulatory agency can represent depositors to better effect. DeYoung et al. (2001) came to a similar conclusion after studying subordinated notes and debentures investors' price reactions to news about their bank's condition. Supervisors appear to have a comparative advantage in influencing banks while market counterparties may have a comparative advantage in identifying changes in bank conditions. Financial firms are more complex than they were two decades ago. New products have permitted risks to be divided into ever-smaller portions. Derivative products and loan sales (syndications) have broken the link between credit underwriting and debt financing. Financial firms can use these products to take risks or to hedge them; outsiders probably find it more difficult to assess true risk exposures. As an example, consider credit default swaps. Wishing to retain a customer relationship, a lending bank probably prefers not to admit that it has off-loaded its exposure to a long-time borrower. Lenders' portfolios are probably more opaque because of these changes.

The transparency of large complex financial firms is not well established. Morgan (2002) finds that banking firms are more likely than other firms to receive split ratings on new bond issues. He concludes that banks are unusually opaque and hard to evaluate. Iannotta (2004) replicates Morgan's analysis for European bond issues during the 1993–2003 period, with roughly similar results. Flannery, Kwan, and Nimalendran (2004) examine other indirect evidence about bank opacity by comparing equity microstructure features of U.S. banks against similar-sized nonbanks.²⁰ They conclude that NYSE-traded banks differ insignificantly from their nonbank matched firms. Nasdaq banks trade significantly less often, and analysts could predict their earnings more accurately, implying that smaller banks are less opaque than their nonbank matches.

The public policy implications of bank opacity depend on the comparative advantages of supervisors versus market counterparties in evaluating complex firms. The AIRB is firmly rooted in the idea that bankers can make better risk assessments than their supervisors. Capital adequacy should reflect sophisticated banks' state-of-the-art risk-assessment and risk-management systems. Arguably, this approach also brings some financial stability benefits: If supervisors don't specify how risk systems should be designed, banks will choose different methods for estimating probabilities of default, exposures at default, etc., and the overall financial system will be diversi-

fied against model risk.²¹ While this view of risk supervision offers some clear advantages, using an institution's own risk models to set its required capital creates an obvious moral hazard.

The private sector's risk assessments can alternatively be incorporated into supervisory policy via NRSRO credit ratings, as discussed above. We might also extract private information from a firm's security market prices or quantities. By understanding the terms on which counterparties are willing to deal with a particular firm, supervisors can benefit from state-of-the-art risk systems, diversified across numerous private actors. Pillar 3 attempts to encourage counterparty discipline through prescribed disclosure. The potential problem with prescribed disclosure is that supervisors may identify the wrong information or the wrong presentation format. In addition, the most relevant information could change over time, leaving pillar 3 to catch up.

Assuming that counterparties can monitor financial firms relatively well, they need proper incentives to do so (Calomiris and Kahn 1991). Counterparties must feel at risk in order for prices to reflect market assessments of a firm's condition. Since 1986, supervisors and legislators have removed many obstacles to the prompt closure of firms with insufficient equity. Fewer banking firms are too big to fail (TBTF) today than in 1986.²² However, the supervisors' resolve has not been tested under stress. Furthermore, the extensive current study of financial stability and systemic risk within central banks raises the distinct possibility that future supervisors will react to a large firm's failure by supporting its creditors and/or equityholders. Such possibilities compromise market discipline. And such conjectures will be rational unless supervisors have a credible method for promptly closing large financial firms and apportioning losses to the various claimants. Furlong and Kwan (2007) note that Benston et al. (1986) recommended that "authorities publicly announce (and follow) policies to deal with depository institution insolvencies and coverage of insured deposits" (8). Stern and Feldman (2006) have recently made the same argument: Without credible, public plans for closing large firms, market disciplinary effects are seriously compromised.

Credible Procedures for Closing Large Financial Firms

The FDIC has recently issued a call for comments on its proposal that approximately 145 large banks maintain depositor records identifying insured balances (*70 Federal Register* December 13, 2005, 73652). Most banks do not maintain records this way, and hence the FDIC cannot quickly determine which depositors are eligible for payout when it takes over a failed bank. Without such a system in place, the FDIC cannot promptly pay out insured depositors without taking at least some "uninsured" depositors into the safety net. This lack of information is a problem for the FDIC, but it pales in comparison with the problem of closing—for liquidation or for recapitalization—a large firm with offices or branches in several countries.

Some authors have lamented the ambiguity associated with various sorts of cross-border legal agreements. Although I don't personally know much about the practical difficulties, they seem quite large. Can an integrated, worldwide institution's liabilities be separated from its assets held in the same jurisdiction? What sort of netting or offset

20. Microstructure features such as trading volume or bid-ask spread characteristics are thought to reflect information availability about the traded stock.

21. As Mao Zedong advised in 1956, "Let a hundred flowers bloom; let a hundred schools of thought contend" (Wikipedia, http://en.wikipedia.org/wiki/Hundred_Flowers_Campaign).

22. "TBTF" here is meant to include financial firms that are too big to reorganize quickly.

rights exist? Are they reliable? Which ones have been tested? How might ring-fencing affect settlements and therefore customers' incentives to run at the first sign of a problem? Do U.S. firms enter foreign markets using subsidiaries or branches? Why? What legal entities do foreign banks use to enter the United States? If a holding company satisfies capital requirements on a consolidated basis, does that mean that the U.S. subsidiaries necessarily have sufficient capital onshore? Or could that capital be held abroad, beyond the reach of U.S. supervisors in the event of a problem?

There may be excellent answers to all these questions. But given the importance of credible closure policies in policing large, complex financial firms, these issues should probably have a prominent place in the next *Safe and Sound Banking* study.

Summary and Conclusion

When all is said and done, the open issues related to financial safety and soundness are surprisingly similar to those discussed by Benston et al. in 1986: We still need to work on resolution procedures, deposit insurance pricing, and capital adequacy. Supervisors have incorporated private information into their regulations by patterning Basel II capital standards after large banks' internal risk-management systems. Market information further affects assessments of bank risk exposures because some capital requirements are determined by credit ratings. We need to know more about how these incentives work. We also need an unbiased understanding of "systemic risk," which was not such a prominent idea in 1986.

The financial system is presently strong, in part because supervisors have improved their techniques. But the target is moving, as the world's largest financial institutions grow more complex and more sophisticated. Here is a very brief summary of some questions to be addressed in the next edition of *Safe and Sound Banking*:

1. How can credit-rating agencies best be used in the supervisory process? What are the dangers associated with their use?
2. How much can we say in general about the combination of banking and commerce in the United States?
3. How do insured and uninsured liabilities affect fair deposit insurance premia?
4. What exactly is "systemic risk," and how dangerous is it?
5. What have we agreed to with Basel II?
6. Counterparty risk assessments seem necessary as financial firms become more complex. How can we translate a firm's price and quantity changes into appropriate supervisory action?
7. What more (if anything) needs to be done before supervisors can credibly close a large, international financial institution in a quick and orderly fashion, without bailing out the initial claimants?

Fortunately for all of us economists, there remains much to study.

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