

# **Should Bank Liability Structure Influence Deposit Insurance Pricing?**

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# **Should Bank Liability Structure Influence Deposit Insurance Pricing?**

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## **Abstract**

In this paper, I discuss the influence of the banking industry's liability structure on the FDIC's risk exposure, the relationship between this exposure and the assessment base, and various ways that the FDIC could incorporate the effects of bank liability structure into its price for deposit insurance. For most of the industry, I find that the FDIC's risk exposure increases when banks move from domestic deposits to other funding sources because decreases in assessment income associated with a smaller assessment base are not offset by reductions in the FDIC's exposure to loss. However, this may not be the case for banks that rely heavily on unsecured credits due to the benefits of market discipline. I outline three ways to incorporate bank liability structure into the FDIC's pricing policy for deposit insurance: 1) change the assessment base; 2) adjust the pricing matrix; and 3) price directly for risk. I conclude that no such changes should be made in isolation. In particular, issues related to bank size must also be addressed because any change associated with liability structure would effectively shift the assessment burden towards larger banks. The FDIC's historical loss experience indicates that, in terms of cost per dollar of expected FDIC losses, large banks already pay considerably more for deposit insurance than small banks. Even though certain characteristics of very large banks may justify higher prices, the size of the current price differential across bank size, combined with the correlation between asset size and liability structure, means that a simple adjustment to the FDIC's pricing policy for bank liability structure would be unwise. Instead, a holistic approach is warranted, considering numerous factors simultaneously.

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## **I. Introduction**

Over the last three decades, banks have increasingly turned to nondeposit sources of funding. During most of the FDIC's history, domestic deposits made up at least 80 percent of total bank assets. As of year-end 2000, the ratio of domestic deposits to total assets at institutions insured by the Bank Insurance Fund (BIF) had dropped to 55.6 percent. It appears quite possible that this ratio will continue to drop.

Changes in bank funding of this magnitude have a significant effect on deposit insurance. The liability structure of a failing bank typically influences the FDIC's losses in two ways:

- When a bank is closed, the percentage of the bank's losses that is borne by the FDIC is determined by the bank's liability structure at failure.<sup>1</sup>
- A bank's funding mix may influence its appetite for risk and thus the FDIC's exposure to loss.

Under the FDIC's current pricing policy, institutions pay assessments based on total domestic deposits, although most institutions pay nothing when the fund balance exceeds 125 basis points. The assessment base (defined as total domestic deposits) may not necessarily correlate well with the risk posed to the insurance fund by the bank's liability structure.

Therefore, some regulators have called for a reconsideration of the relationship between bank liability structure and the pricing policy for deposit insurance.<sup>2</sup>

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<sup>1</sup> In the rare case in which a bank is deemed to pose a systemic risk, the relationship between the FDIC's share of the loss and liability structure may be altered.

<sup>2</sup> In hearings on deposit insurance reform held in July 2001, both the Office of Thrift Supervision (Ellen Seidman [2001]) and the Treasury Department (Sheila Bair [2001]) raised liability structure as an issue that should be considered in a comprehensive review of deposit insurance. In testimony given on February 16, 2000, Gregory Baer from Treasury testified that "the assessment base should be changed to reflect more accurately the FDIC's risk position by accounting for secured borrowings" (Baer [2000], 7).

In this paper, I discuss the influence of bank liability structure on the FDIC's loss exposure, the relationship between this exposure and the assessment base, and various ways in which the FDIC could incorporate the effects of bank liability structure in its pricing policy for deposit insurance. The next section sets the stage by summarizing the legislative and regulatory history associated with the assessment base and presenting a brief history of changes in bank liability structure. Section III examines how bank liability structure influences the FDIC's risk exposure. Section IV discusses options for changing the FDIC's pricing policies and complications that arise because liability structure is correlated with bank size. The final section summarizes and concludes.

## **II. Historical and Regulatory Background**

This section discusses changes to the assessment base and the banking industry's liability structure over time.

### ***A. Legislative and Regulatory Background of the Assessment Base***

The Banking Act of 1933, which established a temporary deposit insurance program, based assessments on insured domestic deposits. The Banking Act of 1935 established a permanent deposit insurance system and defined the assessment base as total domestic deposits. This change was in accord with the FDIC's position that using only insured deposits would cause small banks to pay too large a share of total assessments. Large banks objected to the inclusion of uninsured deposits in the assessment base.<sup>3</sup>

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<sup>3</sup> Silverberg (1993), 2. Note that large banks relied on uninsured deposits more heavily than small banks did.

Since 1935, the assessment base has essentially remained total domestic deposits. In 1991, the Federal Deposit Insurance Corporation Improvement Act (FDICIA) eliminated the statutory provision that defined the assessment base, thereby giving the FDIC the authority to redefine it. In 1994, the FDIC released an Advance Notice of Proposed Rulemaking, stating “because of recent statutory amendments and other developments affecting insured depository institutions, the Board believes review of the assessment-base definition is desirable at this time.”<sup>4</sup> The FDIC cited several developments that motivated the review:

- Risk-based assessments
- Substantially higher assessment rates (thus increased incentives to avoid assessments)
- Changes in the activities of insured depository institutions
- Changes in failure-resolution policies (least-cost-test requirements and the systemic-risk exception).

The FDIC sought comments about a broad range of candidate assessment bases, including insured domestic deposits, total domestic deposits, total domestic and foreign deposits, total domestic deposits and secured borrowing, total liabilities, and total assets. The proposal received 731 comments, mostly from banks and thrifts. Most of the comments supported the use of insured deposits, total domestic deposits, or total domestic and foreign deposits as the assessment base.<sup>5</sup> No significant changes have been contemplated, let alone made, since 1994.

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<sup>4</sup> FDIC (1994).

<sup>5</sup> Note that most of the responses were geared toward how the change would affect the particular respondents’ assessments. Over 60 percent of the comments appeared to be form letters objecting to the inclusion of Federal Home Loan Bank advances in the assessment base.

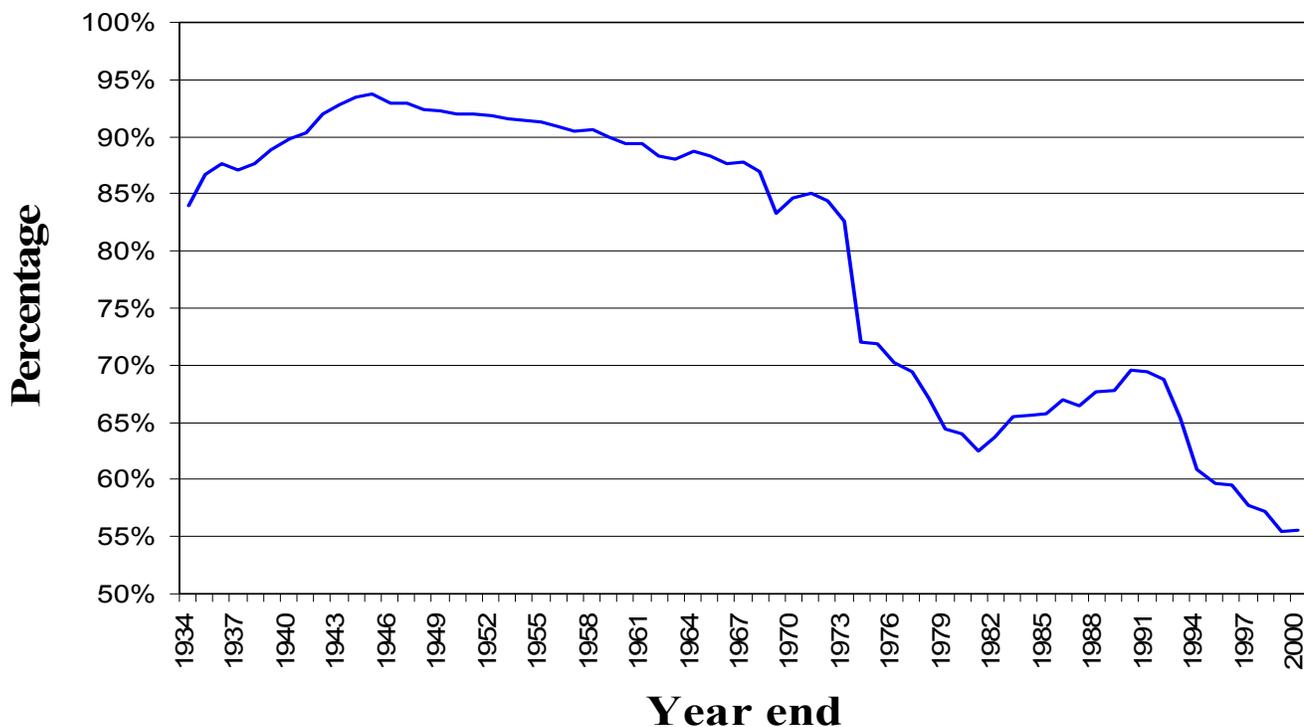
## ***B. Trends in the Banking Industry***

During most of the FDIC's history, domestic deposits made up 80 percent or more of total bank assets. In the 1970s, however, financial markets changed in response to inflation and higher interest rates, resulting in banks taking on larger amounts of nondeposit liabilities. By 1980, domestic deposits made up only 64 percent of total assets. During the 1980s, deposits gradually regained a larger share of bank funding, increasing to 69.5 percent of total assets by 1990. From 1990 to 1999, however, banks' reliance on domestic deposits for funding steadily decreased as banks increased their usage of borrowed funds, foreign deposits and other liabilities.<sup>6</sup> As of year-end 2000, the ratio of domestic deposits to total assets stood at 55.6 percent. Figure 1 illustrates the change in banks' reliance on domestic deposits for funding. Banks now rely far more heavily on foreign deposits, fed funds, repurchase agreements, Federal Home Loan Bank (FHLB) advances, and other forms of borrowing than they did during the first few decades of the FDIC's existence.

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<sup>6</sup> Some of this increase may have been triggered by statutory changes that allowed broader access to FHLB advances. However, FHLB advances made up less than one third of the increase in non-deposit borrowings in the 1990s.

**Figure 1**  
**Domestic Deposits / Total Assets**  
**Commercial Banks**

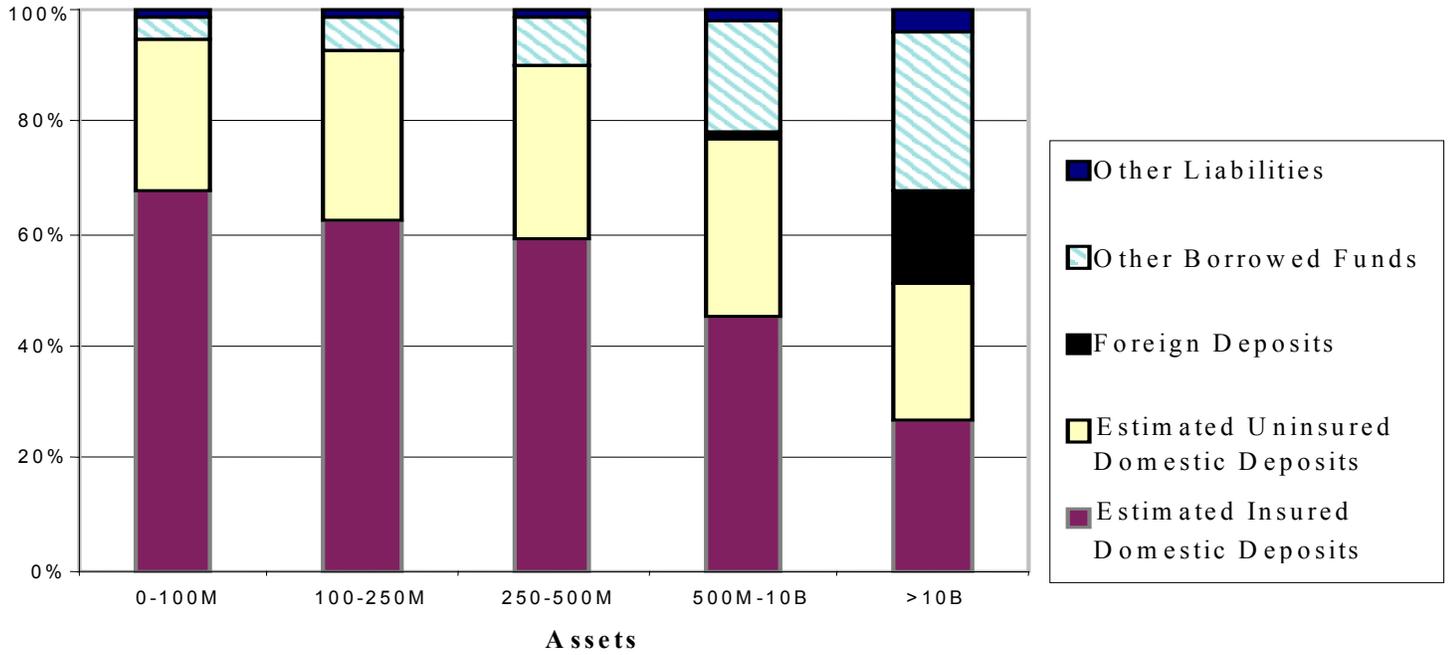


Given the increasing number of investment options available to investors, and funding options available to banks, it appears highly unlikely that the long-term trend will reverse itself in the near future. In fact, before the recent economic slowdown, considerable anecdotal evidence indicated that banks were finding it more and more difficult to attract deposit funding.<sup>7</sup>

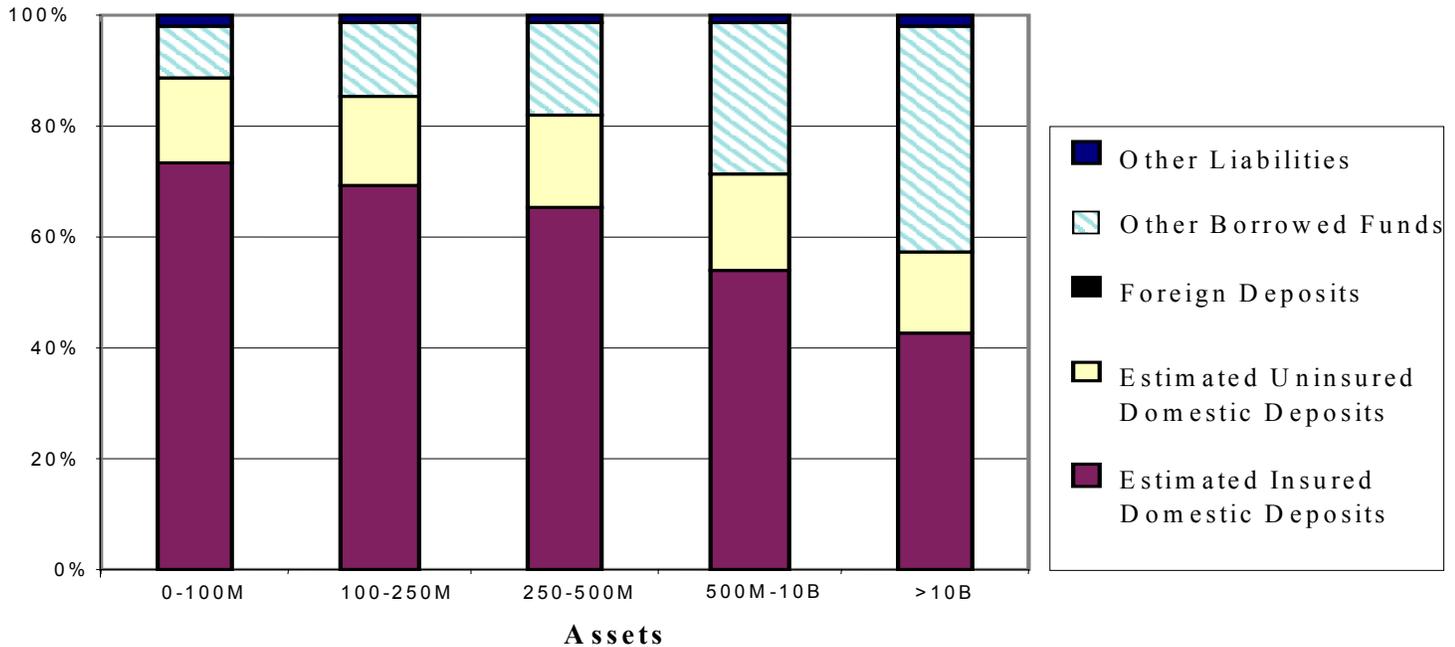
The reliance on nondeposit funding sources differs with asset size. Figure 2 breaks out funding sources for the average BIF member by asset size as of year-end 2000, and Figure 3 does the same for Savings Association Insurance Fund (SAIF) members.

<sup>7</sup> For example, see Garver (2000), Jackson (2001), and Rieker (2001). All of these newspaper articles express serious concerns about insufficient growth in deposits.

**Figure 2**  
**Average Liability Structure -- BIF Member Institutions**



**Figure 3**  
**Average Liability Structure -- SAIF Member Institutions**



For the average BIF member with assets of \$100 million or less, domestic deposits made up 95 percent of total liabilities as of year-end 2000. Institutions with \$100 million to \$500 million in assets also relied very heavily on domestic deposits. For the average BIF member with \$500 million to \$10 billion in assets, domestic deposits made up 77 percent of total liabilities; for the average BIF member with assets over \$10 billion, domestic deposits made up only 51 percent of total liabilities.<sup>8</sup>

For the average SAIF member with assets of \$100 million or less, domestic deposits made up 89 percent of total liabilities. For the average SAIF member with assets over \$10 billion, domestic deposits made up 57 percent of total liabilities. Overall, deposits at SAIF institutions made up 60 percent of total liabilities as of year-end 2000.

Across all asset sizes and both insurance funds, most of the nondeposit funding was made up of “other borrowed funds,” a category that includes FHLB advances, fed funds, repurchase agreements, collateralized mortgage obligations, and other types of borrowing. However, BIF members with assets above \$10 billion also relied heavily on foreign deposits (17 percent of total liabilities).

In summary, the relationship between domestic deposits and total assets is much weaker now than it was when the current assessment base was established, and it appears that the relationship will continue to weaken in the long run. This relationship varies greatly across institutions, with large banks and thrifts far more likely to rely on nondeposit sources for funding. Likewise, thrifts rely more heavily on nondeposit funding sources than banks—except for large banks. Thus any changes to incorporate the risks associated with bank liability

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<sup>8</sup> Two banks (Citicorp, NA and The Chase Manhattan Bank) held almost half of the foreign deposits held by large BIF-insured institutions as of year-end 2000. If these banks were excluded, foreign deposits would have made up 11 percent of total liabilities (and domestic deposits would have made up 56 percent of total liabilities) for the largest BIF-insured stratum.

structure into the price of deposit insurance will have to consider bank size and, to a lesser extent, differences between banks and thrifts.

### **III. The Effects of Liability Structure on the FDIC's Risk Profile**

This section discusses how bank liability structure influences the FDIC's risk position, including the FDIC's assessment revenue, the FDIC's loss exposure at failure, and the likelihood of failure.

#### ***A. Effects on the Share of Losses at Failure***

##### ***A-1. How Liability Structure Influences the FDIC's Share of Losses at Failure***<sup>9</sup>

The National Depositor Preference statute in the Omnibus Budget Reconciliation Act of 1993 governs the priority of the claims of creditors if a bank fails.<sup>10</sup> The statute requires that creditors be paid in the following order:

1. Secured claims (up to the value of the collateral)
2. Administrative expenses of the receivership
3. Domestic deposit liabilities
4. General creditor claims (including foreign deposits and unsecured borrowing)
5. Subordinated claims
6. Cross-guarantee claims (if any)
7. Stockholders.

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<sup>9</sup> Much of this section relies on FDIC (2000), Appendix E-3, 72–73.

<sup>10</sup> Before 1993, general trade claimants typically received the same treatment as the FDIC (except for claimants of state-chartered banks located in depositor preference states). Most of the major banking states did not use depositor preference.

The volume of claims at each level can have a profound effect on the FDIC’s cost if a bank fails. For example, assume three banks with identical assets but different liabilities and capital (Table 1).

**Table 1**  
**Balance Sheet for Three Example Banks**  
**(Dollars in Millions)**

	Bank A	Bank B	Bank C
Total Assets	\$100	\$100	\$100
Liabilities			
Secured claims	2	42	2
Domestic deposits	90	50	83
Unsecured claims	2	2	2
Subordinated claims	<u>0</u>	<u>0</u>	<u>3</u>
Total Liabilities	94	94	90
Capital	6	6	10
<i>Memo:</i>			
<i>Annual assessment per</i>			
<i>basis point (in 000s)</i>	90	50	83

If all three banks were subject to the same risk class for assessment purposes,<sup>11</sup> the liability differences would result in Bank A paying 80 percent higher assessments than Bank B and 8 percent higher assessments than Bank C.

If we assume further that each bank’s assets declined in value to \$85 million, and there were no other changes, these banks would fail. The cost would be borne in the reverse order of priority (as listed above), as shown in Table 2.

<sup>11</sup> Based on the current matrix, this would be the case if all three institutions had a CAMELS rating of 1 or 2, a 6 percent Tier 1 capital rating, a 5 percent leverage capital ratio, and a 10 percent risk-based capital ratio.

**Table 2**  
**Loss Distribution If Three Example Banks Failed**  
**(Dollars in Millions)**

	Bank A		Bank B		Bank C	
	Loss	% Total	Loss	% Total	Loss	% Total
Stockholders	\$6	40%	\$6	40%	\$10	67%
Subordinated claimants	0	0%	0	0%	3	20%
Unsecured claimants	2	13%	2	13%	2	13%
FDIC/uninsured depositors	7	47%	7	47%	0	0%
Total Losses	15	100%	15	100%	15	100%

Thus the amount of bank capital, subordinated claims, and unsecured claims directly reduce the cost borne by the FDIC and the uninsured depositors on a dollar-for-dollar basis. The failure of Bank C, with strong capital plus some subordinated debt, costs the FDIC nothing, whereas the FDIC bears a large portion of the loss for the other two banks; however, Bank C has relatively high assessments. Banks A and B cost the same at failure, but Bank A pays much higher assessments.

Based on this static comparative analysis of FDIC losses at failure, the FDIC's risk of loss at failure is poorly aligned with the current pricing policy. This analysis provides support for either changing the assessment base to secured liabilities plus insured deposits or incorporating the lost assessment income associated with secured funding into the insurance price by other means.<sup>12</sup> Because secured liabilities are paid before the FDIC when a bank fails, they expose the FDIC to losses similar to those of insured deposits. When a bank replaces domestic deposits with secured lending, the FDIC's risk exposure changes very little, but the assessment income associated with the bank decreases.<sup>13</sup> Therefore, the insurance prices do not

<sup>12</sup> Note that the Call Reports do not record total secured borrowing, and only an estimate of insured deposits is recorded. Thus this possible change in the assessment base could involve issues related to regulatory burden and measurability.

<sup>13</sup> Typically the FDIC's loss exposure does not change in situations in which the bank reduces insured and uninsured deposits at the same rate. If uninsured deposits are replaced with secured lending, the FDIC's loss exposure increases slightly; if insured deposits are replaced with secured lending, the FDIC's loss exposure decreases slightly.

align with the risk posed to the insurance fund, and this lack of alignment creates fairness problems: banks that rely heavily on secured borrowing for funding are being subsidized by banks that rely more heavily on domestic deposits for funding.<sup>14</sup> This lack of alignment also means that, under the current funding arrangement, the FDIC's exposure to risk increases when banks increase their reliance on secured credits for funding.<sup>15</sup>

On the other hand, it might be argued that uninsured deposits and unsecured liabilities should be excluded from the assessment base because they serve to mitigate the FDIC's losses. Banks that hold substantial amounts of these credits should receive a discount for insurance coverage because their credit positions at failure reduce the FDIC's loss exposure. However, this argument is only valid if there are no dynamic effects related to the bank or its creditors before failure. These effects may be substantial and must be considered before one reaches a conclusion.

#### *A-2. How Liability Structure Changes Before Failure*

In fact, the relationship between the liability structure of a bank and the FDIC's risk exposure is considerably more complex than in the examples mentioned above. Most, but not all, secured credits have little incentive to exit the bank before failure. In contrast, uninsured depositors and unsecured claimants have a strong incentive to protect themselves before failure. Not all unsecured creditors have the same options available for protection.

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<sup>14</sup> Other authors have noted this phenomenon. See, for example, Stojanovic, Vaughan, and Yeager (2000), Congressional Budget Office (1993), and Silverberg (1993).

<sup>15</sup> This statement assumes that all other factors remain constant. In addition, one might argue that the FDIC could adjust for any such changes in its risk exposure by increasing its assessment rates so that the ratio of premium income to loss exposure could remain stable. However, the change would not reduce the inequities across banks. Also, the FDIC would have to be careful not to provoke additional failures through higher assessment rates.

### *A-2-a. Incentives of Creditors before Failure*

This section discusses the motivation of and opportunities for creditors to exit the bank during the period leading up to failure.

#### *Secured creditors*

The most prevalent types of secured credits include FHLB advances, repurchase agreements, public deposits and borrowings from Federal Reserve Bank (FRB) discount window. Because these creditors rely on collateral for repayment (rather than on the bank's earnings or capital), FHLBs and holders of repurchase agreements and secured public deposits have little incentive to exit the bank before failure. The FRB, however, faces potential credit risk because FDICIA allows the FDIC to charge the FRB for failed-bank losses attributable to discount window borrowings made to undercapitalized banks.<sup>16</sup> Therefore, the FRB would typically have closed the discount window well before failure.

#### *Unsecured creditors*

The most prevalent types of unsecured credits include fed funds, uninsured domestic deposits, and foreign deposits. Because most of these creditors are exposed to credit risk when a bank fails, they have a strong incentive to exit a troubled bank or become collateralized before failure. The relative strength of a creditor's incentive may differ across types of creditors. For example, the incentives of uninsured domestic depositors may be somewhat weaker than those of other unsecured creditors because of their relative standing in a receivership.<sup>17</sup> The opportunity

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<sup>16</sup> Per FDICIA, the FRB's credit risk exposure exists regardless of the value of the collateral. However, FDICIA allows the FRB to lend to undercapitalized banks for brief time periods without being exposed to this form of credit risk.

<sup>17</sup> Uninsured depositors that also have borrowed money from the bank have even weaker incentives, because they have the right to offset their loans with uninsured deposits on a dollar-for-dollar basis if the bank fails.

to flee the bank may differ across banks; it will be influenced by the volume of at-risk credits, the volume of available unpledged assets, and the speed of failure. Most banks fail after a lengthy period of distress. Thus, most creditors have opportunities to protect themselves.

Fed funds are typically very short-term credits, providing the creditors ample opportunity to exit a bank before failure. Most uninsured deposits (both domestic and foreign) either are payable on demand or have a relatively short term to maturity, so they may be easily withdrawn before a bank fails.<sup>18</sup> Foreign depositors can also change their account status to become domestic deposits.<sup>19</sup> Compared with incentives of domestic uninsured depositors, those of foreign depositors are somewhat harder to predict. Some foreign depositors may have deposit insurance protection through the host country. Moreover, the host country may elect to run a separate receivership for that bank. This practice, called “ring-fencing,” usually results in improving the creditor status for foreign depositors and creditors at closing, at the expense of the FDIC and domestic uninsured depositors. If the assets held within a country exceed the liabilities in the country, and the country ring-fences, then the creditors in the country will essentially be fully covered at the expense of the FDIC and domestic unsecured creditors. Thus, some foreign depositors may effectively be able to improve their creditor status *after the bank fails*.

Derivative contracts straddle the line between secured and unsecured credits by requiring collateral for positions whenever a bank is “out of the money.” The contracts are designed to provide protection to these creditors without requiring that the full position be collateralized. Instead, the contracts are usually marked to market on a daily basis, and margin (collateral) must

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<sup>18</sup> Most time deposits also allow for early withdrawal if the depositor is willing to pay a penalty.

<sup>19</sup> Note that banks cannot unilaterally change their foreign deposits into domestic deposits. Each individual depositor must sign off on such a change.

be posted by the bank daily to cover losses. This provides the holders of these instruments with protection (as if they were secured) even though the instruments are generally unsecured. Even so, most companies that trade in derivatives have little appetite for the disruptions associated with bank failures (which may require that they replace a large number of contracts quickly, perhaps in a weak environment), and troubled banks may experience a drop in their derivatives portfolios.<sup>20</sup>

Long-term unsecured or subordinated debt holders have the fewest options for protecting themselves when a bank experiences trouble. In addition, claims related to lawsuits against the bank will usually be unsecured and unable to secure collateral or exit the bank.

In summary, most unsecured creditors have both the incentive and the opportunity to limit or entirely avoid losses at failure at the expense of the FDIC.

#### *A-2-b. Empirical Evidence on Creditor Behavior before Failure*

Experience tends to confirm that most creditors can limit their losses before a bank fails.

#### *Hirshorn and Zervos (1990)*

Hirshorn and Zervos studied the effects of national depositor preference on thrifts insured by the Federal Savings and Loan Insurance Corporation (FSLIC). Table 3 summarizes their finding on the level of collateral at thrifts with four levels of capital in 1987.

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<sup>20</sup> This phenomenon may not relate to the incentives of the creditors. For example, when Long Term Capital Management (LTCM) experienced serious difficulties in 1998 after Russia's bond default, its most significant problems were diminished capital and margin calls rather than a desire by creditors to liquidate their positions. Bankers Trust experienced some difficulties during the same period but did not experience any material reduction in its derivatives portfolio.

**Table 3**  
**Percentage of Nondeposit Liabilities that were Collateralized**  
**FSLIC-Insured Thrifts as of December 1987**

GAAP Capital Level	Average % Collateralized	Weighted Average % Collateralized
Insolvent	66%	88%
0% to 3%	64%	75%
3% to 6%	53%	73%
over 6%	33%	66%

Note: Calculated from data in Hirshorn and Zervos (1990), 117.

For the average insolvent thrift, 66 percent of the nondeposit liabilities were collateralized; for well-capitalized thrifts, the ratio was only 33 percent.<sup>21</sup> Hirshorn and Zervos developed a model that estimated the effect that the 1993 change to domestic depositor preference would have had on the level of collateralization. They estimated that, under depositor preference, thrifts with negative net worth would have collateralized 99 percent of nondepositor claims, and thrifts with capital between 0 percent and 3 percent would have collateralized 54 percent of nondepositor claims.<sup>22</sup> Because all banks and thrifts have been under depositor preference statutes since 1993, their analysis suggests that few unsecured creditors will remain in the bank (or thrift) to suffer losses at failure.

<sup>21</sup> Hirshorn and Zervos (1990), 117. Note that the thrift industry was in distress and the FSLIC was insolvent at the time. Over 10 percent of privately owned thrifts were insolvent as of year-end 1987. Thrifts were often allowed to operate for lengthy periods while insolvent. Also note that the FSLIC frequently made general creditors and uninsured depositors whole at resolution. If the FSLIC had abided by today's FDIC resolution policies, more creditors would have suffered losses at resolution, and the level of collateralization would probably have been higher.

<sup>22</sup> Ibid, 120. They were able to measure this by comparing the liability structure of state-chartered thrifts in depositor preference states with that of other thrifts. Therefore, they did not include the effects of prompt corrective action in the estimates.

*Silverberg (1993)*

Silverberg examined changes to the liabilities of large bank and saving bank failures during the two- to three-year period preceding failure for institutions failing between 1988 and 1992. He reviewed the trends within each failed bank and discussed trends within each type of liability. His sample included 34 banks with assets over \$300 million and 15 savings banks with assets over \$500 million.<sup>23</sup> Most of the institutions failed before the implementation of FDICIA.

For each bank in the sample, Silverberg collected information from the Call Reports about liability structure during the period before failure. From these data, he estimated insured deposits, domestic uninsured deposits, foreign deposits, federal funds, and other secured borrowings.<sup>24</sup>

He found that liabilities shrank by an average of 20 percent during the period before failure and that insured deposits fell less than other types of borrowing. For secured borrowing, the pattern was mixed, with balances increasing at some banks and decreasing at others. For most of the banks, federal funds disappeared before closing. In several cases, however, substantial federal funds were outstanding at failure, but the largest of these cases involved borrowing from an affiliated bank or borrowings where the markets anticipated that the FDIC would cover all creditors (Bank of New England). Foreign deposits disappeared during the period before failure for 60 percent of the banks that held foreign deposits. First Republic held

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<sup>23</sup> He included all commercial bank failures with \$300 million or more in assets, except that he included no more than four banks from the same holding company. He selected a higher asset-size hurdle for savings banks because he indicated that savings banks between \$300 million and \$500 million were more similar to small commercial banks than to large commercial banks.

<sup>24</sup> The Call Report provided actual figures for total domestic deposits, foreign deposits, and federal funds. The figures for other secured borrowings and the breakout of domestic deposits into insured and uninsured segments were estimates. He noted that the estimates for uninsured deposits derived from the Call Report tend to be overstated and that the overstatement can be considerable for large banks (p. 12). Recent changes to the Call Report should improve the quality of the estimate for insured deposits.

most of the foreign deposits that remained at failure, and markets may have anticipated that the FDIC would provide assurances to general creditors if that bank failed.<sup>25</sup>

Silverberg concluded that “non-deposit creditors and foreign branch depositors help finance bad assets of banks before banks fail, are not subject to insurance assessments and are not around to share losses when banks fail.”<sup>26</sup> He recommended that the assessment base be changed to total liabilities minus subordinated debt. This recommendation implicitly assumes that all creditors other than subordinated debt holders will successfully avert losses before failure, leaving the FDIC and subordinated debt holders to shoulder the full cost of failure.

*Marino and Bennett (1999)*

Marino and Bennett studied the effect of national depositor preference on the behavior of bank creditors in six large bank failures that occurred from 1984 through 1992.<sup>27</sup> The authors concentrated on large banks because large banks tend to rely much more heavily on uninsured deposits and nondeposit sources of funds. For each of the six bank failures, the authors collected total liabilities, domestic deposits (with estimates for insured and uninsured deposits), and foreign deposits for the two-year period before failure from the Call Report. They found that “in all of these cases total liabilities decreased, uninsured and unsecured liabilities fell relative to insured deposits, and foreign deposits declined.”<sup>28</sup> They concluded that uninsured depositors and unsecured creditors will always seek to protect themselves when a bank fails.<sup>29</sup>

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<sup>25</sup> Silverberg (1993), 12–13.

<sup>26</sup> *Ibid*, 1.

<sup>27</sup> Data from all banks held by the holding company were summed for analysis.

<sup>28</sup> Marino and Bennett (1999), 27.

<sup>29</sup> *Ibid*, 36.

Five of the six banks were large retail banks that failed after a lengthy period of financial deterioration. The available data for these five banks suggested that most of these creditors successfully fled the banks before failure and that these types of credits declined rapidly just before failure.<sup>30</sup> The sixth failure was Continental Illinois, a wholesale bank that suffered a huge drop in foreign deposits in the months before failure, leading to a liquidity failure. At failure, a large volume of at-risk credits (foreign deposits and uninsured domestic deposits) still remained on the balance sheet—credits that would have suffered losses if the bank had been closed under the least-cost-test rules of today. The authors concluded that “large banks with a retail franchise can better weather a protracted period of financial deterioration before experiencing liquidity insolvency [compared with banks lacking a retail domestic deposit franchise].”<sup>31</sup> In short, they found that the failed banks fell into two distinct classes:

1. Retail banks, where most of the failure cost will typically be shifted to the FDIC
2. Wholesale banks, where much of the failure cost will typically be borne by other creditors under the least-cost test because many of these creditors will be unable to flee the bank or obtain collateral, given the relative speed of failure and the large volume of at-risk creditors.

Marino and Bennett continued their analysis by collecting liability data on the largest 50 bank holding companies as of December 31, 1998. They found that most of the top 50 banks had a retail rather than a wholesale liability structure. If any of the retail banks failed, the FDIC would most likely bear nearly all of the losses.

There are substantive differences among the wholesale banks. Some wholesale banks have a significant presence in foreign markets.<sup>32</sup> To the extent that foreign countries are able to

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<sup>30</sup> Ibid, 28.

<sup>31</sup> Ibid.

<sup>32</sup> Table 7 on page 36 of Marino and Bennett provides information about differences in liability structure.

extract value for their creditors through ring-fencing, the FDIC's ability to impose losses on general creditors in foreign countries is limited. In addition, some of the wholesale banks exhibit traits that may lead regulators to consider the least-cost resolution of such a bank to pose a systemic risk.<sup>33</sup> If so, then the FDIC could bear some—possibly even all—of the losses that otherwise would be borne by uninsured depositors and general trade creditors.<sup>34</sup> Therefore, it is unclear whether the at-risk creditors would bear a substantial part of the loss if a large wholesale bank were to fail. One can, however, be certain that these creditors would actively attempt to minimize their exposure.

*Jordan (2000)*

Jordan studied the effects of depositor discipline on New England banks that failed in the early 1990s. He explained that the market for uninsured deposits is largely a national market that is more competitive and requires higher returns than the insured deposit market, which tends to be local. He presented a simple theoretical model demonstrating that, as banks experience distress, they will: a) shift some of their funding from uninsured to insured deposits; b) experience a higher cost of funds; and c) reduce loan supply in response to their higher cost of funds. He cites two other factors that will probably reduce a bank's demand for funds during periods of distress: a) deteriorating economic conditions, which will further reduce loan demand,

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<sup>33</sup> For example, they are heavily involved in the derivatives market or in payment processing.

<sup>34</sup> A systemic-risk determination allows the FDIC to select a resolution method that does not minimize the cost to the insurance fund(s). It requires a recommendation from the FDIC Board and the Federal Reserve Board and must be approved by the Secretary of the Treasury, after consultation with the President. It can be made only if regulators believe that the least-cost resolution of the bank poses a systemic risk. Systemic risk may be mitigated if the FDIC reduces the losses borne by uninsured depositors and/or general trade claimants.

and b) regulatory requirements to increase capital ratios (which are improved when a bank reduces its size while maintaining its capital level).<sup>35</sup>

For a sample of 65 failed banks in New England, Jordan collected Call Report data for the two-year period before failure. He collected data for total deposits, jumbo CDs (defined as certificates of deposit above \$100,000), and small CDs (below \$100,000). Most jumbo CDs are at least partly uninsured, whereas most smaller CDs are fully insured.<sup>36</sup> He broke the sample into quartiles, based on the degree to which the banks relied on jumbo CDs for funds. Across the full sample, jumbo CDs made up an average of 12 percent of deposits two years before failure; for the fourth quartile, jumbo CDs made up an average of 22 percent of deposits.<sup>37</sup> For each quartile, he calculated the median change in each type of deposit during the two-year period before failure. His results are shown below.

**Table 4**  
**Median Percentage Change over Final Two Years of Operations**  
**65 Banks That Failed in New England, 1989 to 1995**

Quartile	Number of Observations	Total Deposits	Small CDs	Jumbo CDs
1	16	-12.77***	-13.09*	-39.90**
2	16	-13.22***	-15.12	-66.76***
3	17	-10.18	6.85	-65.65***
4	16	-6.63	44.44***	-61.28***
Full Sample	65	-11.10***	2.95	-61.77***

\* Significant at the 10% level.

\*\* Significant at the 5% level.

\*\*\* Significant at the 1% level.

Source: Jordan (2000), 22. Note that the reductions recorded in this table exclude the period between the bank's final Call Report and failure.

<sup>35</sup> Jordan (2000), 19.

<sup>36</sup> Jordan notes that switching costs (costs associated with changing banks) would be higher for transaction account and savings account holders than for CD holders. Because of these switching costs, banks in need of a quick infusion of deposits may look to the CD market for new deposits rather than to transaction accounts or savings accounts. (See p. 16–17.)

<sup>37</sup> Jordan (2000), 21.

The results show that, for the top three quartiles (in terms of jumbo CD usage), most jumbo CDs exited the bank during the two-year period before failure. Moreover, banks in the fourth quartile—banks that relied most heavily on jumbo CDs—increased their use of small CDs by 44 percent during the period leading to failure. For these banks, the dollar increase in small CDs more than offset the decrease in jumbo CDs.

Jordan also compared the interest rates on CDs paid by the sample of failing banks to interest rates paid by their peers.<sup>38</sup> He found that interest rates were significantly higher for the two quartiles that relied most heavily on jumbo CDs, but not for the other quartiles.<sup>39</sup> He concluded, “the evidence is consistent with supply shifts playing an important role for banks with significant exposure to the uninsured market, but only a modest role for those banks with little exposure.”<sup>40</sup>

### *A-3. Conclusions Related to the FDIC’s Loss at Failure*

An analysis of the incentives of creditors before failure, plus a review of the available empirical evidence, supports a somewhat different conclusion from the one reached by simply comparing losses of hypothetical banks at failure. Banks typically hold few at-risk credits at failure, regardless of their liability structure before experiencing distress. For most banks, clear signs of distress arise well before failure, providing sufficient time and incentives for most at-risk creditors to shift their risk to the FDIC before failure. However, at-risk creditors at large wholesale banks (or other banks where a substantive portion of the balance sheet is funded by

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<sup>38</sup> A number of peer groups were tested, and the results were robust across peer group definitions.

<sup>39</sup> Jordan (2000), 25. For small CDs, the fourth quartile paid 24 basis points over their peers and the third quartile paid 23 basis points over their peers, both significant at the 5% level. For jumbo CDs, the fourth quartile paid 56 basis points over their peers (significant at the 1 percent level). The third quartile paid 21 basis points more, but it was not statistically significant.

<sup>40</sup> Ibid.

at-risk credits) might shoulder a significant portion of the loss under the least-cost test—particularly if a liquidity failure occurs. Banking regulators might find that the least-cost resolution of certain large wholesale banks poses a systemic risk; in these circumstances, it is unclear what portion of the loss would be borne by the FDIC.

On the basis of this additional information, it appears that the assessment base should include secured credits, insured deposits, and some portion of uninsured deposits and unsecured credits.<sup>41</sup> The amount, however, is unclear. Silverberg recommended that the full amount (except subordinated debt) be included in the assessment base because at-risk creditors are quite successful at shifting losses to the FDIC.<sup>42</sup> On the basis of the analysis thus far, this argument appears sound for most banks, but it may penalize banks that rely heavily on unsecured credits for funding. Before coming to any final conclusion, one must consider how a bank's liability composition may influence its behavior before failure.

### ***B. Effects on a Bank's Appetite for Risk***

Does a bank's reliance on secured or at-risk credits influence the bank's propensity to take on risk, its likelihood of failure, or its total losses at failure? If so, adjustments to deposit insurance pricing policy based solely on the FDIC's share of losses at failure may not fully capture the FDIC's risk exposure attributable to a bank's liability structure. Because there is not much empirical literature that directly addresses this question from the FDIC's perspective,<sup>43</sup> this section relies largely on a theoretical discussion of the incentives of the creditors and how these

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<sup>41</sup> Alternatively, premiums could be adjusted to effect the same change.

<sup>42</sup> Silverberg (1993), 1.

<sup>43</sup> Most of the literature about the risk of depository institutions associated with liabilities addresses the question of interest-rate risk and potential maturity mismatches between assets and liabilities. Because the maturity of a liability is unrelated to its creditor position at failure, this literature does not inform the present discussion.

incentives influence the FDIC's risk profile. Secured credits and at-risk credits are reviewed separately because their incentives differ.

### *B-1. Secured Credits*

This section addresses the question of whether the use of secured borrowing influences the risk profile of the bank and, in particular, whether the collateral requirements for secured borrowings cause banks to hold a larger portion of their portfolios in low-risk assets. If so, the FDIC's lost assessment income caused by secured lending would be offset—either partly or wholly—by a reduction in the risk profiles of insured banks.

#### *B-1-a. Theoretical Model*

I address the question by using the following model:

- (1)  $TA = A_{HR} + A_{LR,F} + A_{LR,C}$
- (2)  $TL = Dep + Sec + Unsec$
- (3)  $Sec = A_{LR,C}$
- (4)  $RM = A_{HR} / (A_{LR,F} + A_{LR,C})$

Where:

- $TA$  = total assets
- $A_{HR}$  = high-risk assets
- $A_{LR,F}$  = low-risk assets that are free from collateral requirements
- $A_{LR,C}$  = low-risk assets that are pledged as collateral
- $TL$  = total liabilities
- $Dep$  = deposits (which are unsecured)
- $Sec$  = secured borrowing
- $Unsec$  = unsecured borrowing (excluding deposits)
- $RM$  = risk measure

Equation (1) breaks a bank's asset portfolio into high-risk and low-risk components; low-risk assets are further segregated into those that are pledged as collateral and those that are free from such requirements. Equation (2) breaks a bank's liabilities into deposits, secured credits,

and unsecured credits. Equation (3) indicates that all secured credits must be collateralized by low-risk assets. Equation (4) indicates a bank's preference for high-risk assets compared with low-risk assets (some of which may be pledged).<sup>44</sup>

When a bank increases *Sec*, it must increase  $A_{LR,C}$  by the same amount. To meet the new collateral requirement, the bank has four basic options. If it stays the same size (i.e., it increases *Sec* and decreases *Dep* or *Unsec*), it can reduce either  $A_{HR}$  or  $A_{LR,F}$ . A reduction in  $A_{HR}$  will improve *RM*, and a reduction of  $A_{LR,F}$  will not change *RM*. If the bank grows, it can invest in additional  $A_{LR,C}$  (improving *RM*), or it can invest in additional  $A_{HR}$  and shift  $A_{LR,F}$  to  $A_{LR,C}$  (causing *RM* to deteriorate).

If a bank has more  $A_{LR,F}$  than it needs for liquidity purposes, it can make decisions about *RM* independently from its decisions about funding via *Sec*. When this is the case, any improvements in *RM* cannot be attributed to increases in *Sec*. For the segment of the banking industry in this circumstance, an increase in *Sec* causes a deterioration in the FDIC's risk profile because it causes a loss in assessment income without triggering any offsetting improvement in the FDIC's loss exposure.

Unfortunately, the Call Report does not provide a reliable estimate of  $A_{LR,F}$ , and the most recent reliable estimate for thrifts comes from the 1997 Thrift Financial Report. As of year-end 1997, however, it appeared that almost every thrift in the country would have had enough  $A_{LR,F}$  to make funding decisions separately from decisions about the risk profile of its assets.<sup>45</sup>

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<sup>44</sup> Equity capital is excluded from the risk measure because capital levels generally do not constrain the use of secured credits for funding, and because we are attempting to isolate the relationship between secured borrowing and riskiness of the asset portfolio—not the riskiness of the bank as a whole.

<sup>45</sup> We estimated  $A_{LR,F}$  as cash plus securities plus mortgage-backed securities plus total 1-4 family mortgages minus repurchase agreements minus CMO liabilities minus FHLB advances. Only 5 percent of the thrifts held less than 35 percent of their assets in  $A_{LR,F}$ , and only 1 percent of thrifts held 19 percent or less of their assets in  $A_{LR,F}$ .

Note that this model has simplifying assumptions that could influence the result. In particular, equation (2) assumes that secured funds are never overcollateralized and that high-risk assets are never pledged as collateral. Neither of these assumptions is entirely realistic. Overcollateralization occurs frequently—particularly with FHLB advances. Overcollateralization will reduce the size of  $A_{LR,F}$ , and therefore increase the number of banks that are unable to increase  $Sec$  without reducing  $RM$  (thus becoming less risky). If the required amount of additional collateral is modest (either because the degree of overcollateralization is low or because  $Sec$  makes up a relatively small portion of  $TL$ ), the additional collateral requirement may not influence a bank’s decisions about risk exposure.

The Gramm-Leach-Bliley Act of 1999 allowed most banks to collateralize FHLB advances with small business and small farm loans, and it lifted the cap on riskier types of real estate loans (such as commercial real estate loans) that could be posted as collateral. Thus, contrary to the model’s assumption, some types of high-risk assets can now be used to collateralize at least one frequently used form of secured borrowing. If  $Sec$  can be collateralized with  $A_{HR}$ , fewer banks are constrained by a lack of  $A_{LR,F}$ , and thus a larger portion of the industry is able to increase  $Sec$  without being forced to improve  $RM$ .<sup>46</sup>

The situation could be worse for the FDIC than the model indicates, for three reasons. First, because secured credits are readily available, banks may rely less on at-risk credits, thereby reducing their exposure to market discipline. Second, because secured creditors do not suffer losses when a bank fails, banks that are experiencing problems can increase their reliance on secured funds at times when unsecured creditors will otherwise impose market discipline on them. Thus, the availability and use of secured borrowing might diminish the benefits of market

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<sup>46</sup> In fact,  $RM$  can increase if high-risk loans are pledged to the FHLB and the advances are used to book more high-risk loans.

discipline (which are discussed below) in two ways.<sup>47</sup> Third, the ready availability of secured funding might make it easier for banks to pursue high-growth strategies that impose higher risks on the FDIC.<sup>48</sup>

### *B-1-b. Empirical Evidence*

There have been a few studies of the effects of FHLB advances on bank risk profiles and performance. Using historical data from 1992 through 1999, Stojanovic, Vaughan, and Yeager measured the relationship between the use of FHLB advances and numerous risk measures at commercial banks. They studied both membership in the FHLB system and use of advances. They found that FHLB members were somewhat riskier than nonmembers and that banks that relied most heavily on advances were somewhat riskier than banks that relied the least on advances.<sup>49</sup> Although the differences were statistically significant, the authors concluded that they were not economically large. They argued that risk taking had been checked by high capital ratios, which would have served to maintain market discipline regardless of the banks' liability structure.<sup>50</sup>

Ashley, Brewer and Vincent studied the use of FHLB advances by thrifts from 1985 to 1991. They found that distressed thrifts relied more heavily on FHLB advances than stronger

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<sup>47</sup> This is discussed in more detail in Ashley, Brewer, and Vincent (1998). See also Stojanovic, Vaughan, and Yeager (2001).

<sup>48</sup> The Office of the Comptroller of the Currency (2001) found that banks that rely on wholesale funding tend to have higher credit and interest rate risk. However, its analysis did not separate secured borrowing from other wholesale funding vehicles that might have a different relationship to a bank's risk profile. For example, most banks can rely on brokered deposits or money-desk deposits to fund high-growth strategies.

<sup>49</sup> Stojanovic, Vaughan, and Yeager (2001), 17, 24.

<sup>50</sup> *Ibid*, 30–31.

thrifts throughout the period. For example, they found that in 1988, the ratio of FHLB advances to total assets was 5.5 percent for thrifts with GAAP capital above 3 percent of total assets, but 10.8 percent for insolvent thrifts.<sup>51</sup> They concluded that “by insulating them from market discipline, FHLB advance programs provide incentives for thrifts to take more risk.”<sup>52</sup>

In summary, the available empirical evidence indicates that the use of secured funding does not decrease—and may even increase—a bank’s appetite for risk, particularly for banks that are not well capitalized. Thus the FDIC’s loss of assessment income from secured borrowing is not offset by reduced risk exposure and may actually be compounded by an increased probability of default.

#### *B-2. Unsecured Credits*

Numerous authors have argued that market discipline provides enormous benefits to the FDIC. It also imposes some costs on the FDIC. Several of the reforms included in FDICIA were based on the premise that the deposit insurance system in place at that time sheltered banks too much from the discipline of the market. It is useful to review how the market might influence the FDIC’s loss exposure. In this section, I discuss only those aspects of market discipline that relate to a bank’s liability structure.

In what ways does market discipline act to reduce the FDIC’s exposure? First and foremost, all banks that rely on at-risk credits—even very healthy banks—recognize its effects. Because bankers know that at-risk creditors demand higher interest rates when banks experience trouble, and exit altogether when banks are in peril, they understand that taking on higher levels of risk can be accomplished only at the cost of potentially more expensive funding or liquidity

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<sup>51</sup> Ashley, Brewer, and Vincent (1998), 41.

<sup>52</sup> *Ibid.*, 47.

pressures. Thus market discipline serves to reduce banks' appetite for risk, which in turn reduces the risk of failure.

This benefit of market discipline exists at least to a limited extent for banks that do not rely heavily on at-risk credits for funding but are contemplating heavier use of such credits or want to retain the option of using them. For healthy banks contemplating such use, this phenomenon is unlikely to influence their attitudes toward risk *unless* they are considering a *significant* use of at-risk credits. For troubled banks contemplating such use, the markets will discourage—and sometimes disallow—any movement into at-risk funding vehicles. It is not clear, however, that markets place any meaningful constraints on troubled banks unless they are already funded by at-risk credits. The regulatory constraints imposed on troubled banks, particularly the constraints on asset growth and capital ratios, mean that troubled banks are typically shrinking. Absent a material amount of at-risk credits, troubled banks normally will not need to seek out new funding sources.<sup>53</sup>

Situations arise, however, in which even healthy banks are penalized by market discipline. For example, examine the marketplace in Texas during the depths of the banking and savings and loan crisis. Banks and thrifts throughout Texas were paying higher interest rates than those in the rest of the country, regardless of the health of any individual institution.<sup>54</sup> At-risk creditors may be unable to make fine distinctions as to the riskiness of individual banks—particularly small banks where unsecured creditors have limited access to data.

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<sup>53</sup> One exception is troubled banks that have been ordered to reduce their reliance on brokered deposits or high-cost insured deposits. Another exception is banks that had been relying on the FRB's discount window. Regulatory restraints on these funding sources, coupled with market constraints on at-risk credits, can markedly influence the bank's behavior. For example, the market constraints might push a bank to shrink more than it would otherwise have contemplated.

<sup>54</sup> The funding differential was exacerbated by the large number of insolvent thrifts in the area that remained open because of the FSLIC's insolvency. Healthy banks had to compete with these thrifts for local funds.

The second benefit of market discipline arises because at-risk creditors provide banks with an independent source of information about their risk profiles and performance. If a bank relies completely on secured credits and deposits, bank regulators are the primary source of independent information.<sup>55</sup> It is not unusual for management at a troubled bank to view the comments of regulators as excessively negative and to ignore or downplay their concerns. If the market confirms the regulators' concerns, bank management may be led to react to problems more promptly, thereby reducing both the risk of failure and the FDIC's loss if failure occurs.

A third benefit of this independent appraisal of a bank's performance is that it provides regulators with more information, thereby reducing the chance that regulators might miss or understate a bank's problems. The additional information increases the probability of a prompt, accurate regulatory response to a troubled bank, which typically results in a lower probability of failure and lower losses to the FDIC if failure occurs. In addition, it takes some pressure off regulators.

A fourth and less frequently cited reason that market discipline reduces the FDIC's losses is that a heavy concentration of at-risk credits increases the likelihood of a liquidity failure when capital levels are above the minimum requirements under FDICIA, thereby reducing the FDIC's losses. Although liquidity failures introduce operational challenges to the FDIC, they by definition force regulators to close a bank more quickly than would otherwise occur.<sup>56</sup> Liquidity

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<sup>55</sup> For publicly traded companies, equity markets also exert market discipline; thus, having a material volume of at-risk credits may be more important for privately held banks.

<sup>56</sup> Some would argue that this benefit should not exist because FDICIA gave regulators the authority to close banks when capital falls below 2 percent, and regulators have the authority to define capital so that it aligns closely with the true market value of the bank. However, the opaque nature of many banking assets leads to difficulties in maintaining accurate reserve levels on risky assets—particularly for troubled banks that frequently increase reserves only at the insistence of regulators. This problem, combined with concerns about wrongful closure and limitations imposed by GAAP accounting requirements, complicates the regulator's job. Even after FDICIA, most bank failures have resulted in FDIC losses. Moreover, the historical relationship between book capital levels and FDIC loss rates is quite weak, which indicates that book capital levels are not strong indicators of losses in receivership. In addition, note that the FDIC has the authority to close banks for safety-and-soundness reasons even absent capital or liquidity deficiencies. However, to protect banks from wrongful closure, such an action requires extensive

failures can yield cost savings to the FDIC by reducing operating losses before failure and by closing the bank at a higher capital level. For example, Guardian Bank was a liquidity failure that occurred in 1995. Twenty days before failure, it reported equity capital of 5.2 percent of assets on its Call Report—much too high to justify closure in the absence of the liquidity crisis. Guardian relied heavily on at-risk creditors for funding. Although many of Guardian’s at-risk creditors exited the bank before failure, an unusually high percentage of the bank’s deposits at closing were uninsured (7.5 percent).

Market discipline also has negative effects on the FDIC’s loss exposure. Most important, at-risk creditors are generally successful at shifting their risk to the FDIC (as described in Section III-A-2. above). In addition, when facing liquidity pressures, banks may resort to selling assets at “fire sale” prices in order to meet withdrawal requests of at-risk creditors. Finally, banks experience the pressures of market discipline as an increase in their cost of funds, which increases operating expenses, which may in turn increase losses at failure.<sup>57</sup>

Recall that the market discipline related to nondeposit liabilities is not evenly distributed across banks or types of nondeposit credits. As shown in the earlier discussion of secured credits, the holders of such credits impose little or no discipline on banks.<sup>58</sup> The results of Marino and Bennett and Jordan lead to a conclusion that market discipline appears to have little influence on banks that routinely rely on secured credits or insured deposits for funding, or on banks that use only small amounts of at-risk credits for funding. Most of the benefits of market

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documentation and approvals. Regulators have used this authority only rarely, perhaps because of the extensive requirements but perhaps also because of the difficulties in predicting failure accurately.

<sup>57</sup> See Jordan (2001) for empirical evidence of increased interest expenses. It would be reasonable to expect that operating losses caused by market discipline would increase the FDIC’s loss to some degree. However, the extent to which operating losses would influence the FDIC’s loss rate (rather than the speed of failure) is unclear.

<sup>58</sup> A notable exception is the requirement in FDICIA that the FRB withdraw access to the discount window for undercapitalized banks.

discipline relate to the relatively small segment of banks that use material amounts of at-risk credits for funding. For these banks, the market may have a profound effect on the level of risk that they are willing to accept and on their vigilance in managing risk.

**C. Summary of Effects on the FDIC’s Risk Profile**

Table 5 provides a brief summary of how various bank liability structures influence the FDIC’s risk profile, assuming that the current pricing policy for deposit insurance remains in place. It classifies various effects into three general categories: a small increase in FDIC risk (+), a large increase in FDIC risk (+ +), and a small decrease in FDIC risk (–). All of these classifications should be treated as comparisons to a bank that relies entirely on insured domestic deposits for funding. Because the incentives and behavior of secured and at-risk creditors differ, the table summarizes them separately. A distinction is also made between the effects of small and large volumes of these credits. To gain insight into the net influence of each type of credit on the FDIC’s risk profile, consider the mix of increases and decreases recorded in the appropriate column.

**Table 5  
Summary of Effects of Liability Composition on the FDIC’s Risk Profile**

Factors that influence FDIC risk	Secured Credits		At-risk Credits	
	Small	Large	Small	Large
Assessment income*	+	+ +	+	+ +
Loss-sharing at failure				–
Increased appetite for risk due to reduction in market discipline		+		
Ability to fund high-risk growth strategies		+		
Increased cost of funds (thus operating expenses) before failure			+	+
Awareness of potential costs influences risk decisions while bank is healthy				–
Markets provide regulators additional information about the bank				–
Bank management gets more signals, thus may react to problems faster				–
Higher probability of liquidity failure, which could be cheaper to resolve				–

+ = small increase in FDIC risk                      – = small decrease in FDIC risk  
+ + = large increase in FDIC risk  
\* The increases for at-risk credits do not apply to uninsured domestic deposits.

When a bank has a small amount of secured credits, the FDIC merely loses a little assessment income. A small amount of at-risk credits has a similar effect on the FDIC's risk profile.<sup>59</sup> Losses to assessment income grow with the volume of secured credits. There is some evidence that secured credits reduce the benefits of market discipline on troubled banks by providing troubled banks ready access to funds with interest rates that are insensitive to their financial condition.<sup>60</sup> In addition, banks could use such funding to engage in high-growth strategies that sometimes become high-loss failures. Overall, it appears that secured credits—particularly large amounts of them—are detrimental to the FDIC, in the absence of changes to its pricing policy.

A large volume of at-risk credits influences the FDIC's risk profile in numerous ways, making the net result difficult to predict. Assessments are substantially reduced, but that is offset by the potential for loss sharing were the bank to fail. Although difficult to measure, the benefits and costs of market discipline are also important factors that probably serve to offset some of the lost assessment income. Banks with a large volume of at-risk credits may be more leery of risky strategies than other banks, since both the market and regulators will penalize them if problems arise. The market will provide additional information to the bank and its regulators about the bank's condition, which might reduce the FDIC's losses if the bank fails. On the other hand, if such a bank fails, it is likely to experience higher operating costs as at-risk creditors demand higher interest rates or force the bank into a costly search for replacement funding sources or a rash liquidation of assets at below-market prices.

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<sup>59</sup> The case of uninsured domestic deposits is an exception, for then there is no reduction in assessment income.

<sup>60</sup> The FRB's discount window is an exception because access to funds is withdrawn from undercapitalized banks.

If the at-risk credits are uninsured domestic deposits, the FDIC benefits considerably, since the benefits of potential loss sharing at failure and market discipline will remain but assessment income will not be lost.

#### **IV. Pricing Policy Alternatives**

This section discusses possible methods to address the imbalance between the FDIC's risk exposure and the assessment base.

##### ***A. Criteria for Analyzing Changes***

In its Advance Notice of Proposed Rulemaking in 1994, the FDIC identified five criteria as useful in analyzing the candidate assessment bases:

1. Fairness
2. Measurability
3. Degree of risk posed to the deposit insurance funds
4. Ability of insured institutions to make adjustments solely to avoid assessments
5. Recordkeeping burden.<sup>61</sup>

If the FDIC changes the assessment base in the future, it should use these five criteria as well as three others. First, any changes to the current scheme should be robust—in other words, any new scheme should work well under a variety of circumstances that might face the FDIC and the banking industry in the future.<sup>62</sup> Second, its effects on market efficiency should be considered. For example, if foreign deposits were included in the assessment base, banks with a large volume of foreign deposits might undergo costly and inefficient reorganization to create foreign affiliates

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<sup>61</sup> FDIC (1994).

<sup>62</sup> Blair and Carns (1994), 4.

in an effort to reduce their assessment expenses.<sup>63</sup> The FDIC should consider what types of changes to the marketplace might occur if significant changes are made to address liability composition, and whether the changes would reduce market efficiency.

The third additional criterion is the appropriate function of the assessment base. Most insurance products are priced according to the quantity of insurance desired. For example, life insurance prices are based on the amount of coverage desired in the event of death, and homeowners' insurance prices are based on the value of the home being insured. For any given level of coverage, prices are the mechanism used to adjust for the insurance company's risk in providing coverage. For example, life insurance premiums are higher for people with health problems.

## ***B. Pricing Alternatives***

A number of possible options might be used to improve the alignment between the FDIC's pricing policy and its risk exposure associated with bank liability structure. I present three options here.

### ***B-1. Change the Assessment Base***

The FDIC could redefine the assessment base. Several proposals have been made, including insured deposits; secured liabilities and domestic deposits; secured liabilities, domestic

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<sup>63</sup> Another possibility is that a change to the pricing policy for bank liabilities could alter the industry's cost of funds, which in turn could influence the industry's ability to fund its activities. The availability of alternative cost-effective sources of funds, and notably the large increase in outstanding FHLB advances, has allowed many banks to grow faster than their deposit bases. The FDIC's treatment of nondeposit funding sources in its pricing policy may have contributed to this change. The growth in nondeposit funding sources may have fostered economic growth by allowing for stronger loan growth than would otherwise have occurred, particularly for loan products where banks face little nonbank competition for originating loans. However, if the loan markets are already highly competitive, it might instead merely allow banks that rely on nondeposit funding sources to compete against other lenders more successfully or increase their profits while providing minimal net benefits to society as a whole.

deposits, and foreign deposits; total liabilities except subordinated debt; total liabilities; or total assets. Another possibility would be to define the assessment base as all secured liabilities and insured deposits, plus some fraction of uninsured deposits and other at-risk credits. The analysis in this paper provides support for changing to either secured credits plus insured deposits or secured credits, insured deposits, and some fraction of at-risk credits (excluding subordinated debt). For at-risk credits, one might consider including a relatively large fraction of such credits for banks with few at-risk credits, but a smaller fraction of at-risk credits above some threshold. For example, one might include 70 percent of at-risk credits below 5 percent of total liabilities, but only 10 percent of at-risk credits above 5 percent of total liabilities. This scheme would be consistent with the premise that only large volumes of at-risk credits yield benefits to the FDIC that offset the lost assessment income.

To follow the insurance industry norm, the FDIC's assessment base would be defined as insured deposits.<sup>64</sup> This would have the advantage of clarifying the cost of deposit insurance, since all price differences would be consolidated into the insurance premium. If the FDIC were to use insured deposits as the assessment base and, like private insurers, price according to its risk exposure, then the premium rates would indicate the risk of FDIC loss per dollar of insured deposits. Thus, prices (per dollar of insured deposits) would be based on the estimated probability of bank failure multiplied by the expected severity of loss. Under the current pricing matrix, prices vary according to capital levels and CAMELS ratings. These roughly correspond to a bank's probability of failure but do not consider severity of loss. Because the FDIC does not use insured deposits as the assessment base, and because loss severity is not included in its

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<sup>64</sup> Around the world, most deposit insurers tend to use either total deposits or insured deposits as the assessment base. Other assessment bases include domestic deposits, deposits and nonperforming loans, risk-weighted assets and total deposits, insured liabilities, and insured savings deposits. See Garcia (1999) for details.

pricing matrix, an FDIC move toward insurance industry standards would constitute a significant policy shift.

Another reason to consider using insured deposits as the assessment base relates to the fairness criterion. The Association for Finance Professionals has recommended the use of insured deposits as the assessment base, stating that such a change is “fundamental to fair reform of the deposit insurance system.”<sup>65</sup> The association explains that banks generally pass through deposit insurance costs to corporate customers on the basis of account size. Therefore, its members pay insurance on their full deposit balances (customarily well above \$100,000) but receive insurance only on the first \$100,000.<sup>66</sup>

Some of these proposals would be more closely aligned with the FDIC’s risk exposure and, in some cases at least, would improve the fairness of the system. For many of them, data availability (and perhaps recordkeeping burden) would be a problem.<sup>67</sup>

#### *B-2. Adjust the Pricing Matrix*

A second possible means for changing the current pricing policy would be to adjust the risk matrix to incorporate risks associated with liabilities. Assessment rates could be adjusted upward for banks with liability profiles that increased the FDIC’s exposure, and downward for banks that posed less risk to the insurance funds. For example, the assessment rate could be increased by 50 percent of the ratio of secured credits to domestic deposits, resulting in a change

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<sup>65</sup> Association for Financial Professionals (2001), 4.

<sup>66</sup> Ibid. Although the assessment charge appears extremely unfair on the surface, recall that the reality is more complex. Many uninsured depositors exit the bank during the period shortly before failure, effectively pushing their risk exposure to the FDIC and to any uninsured depositors who do not exit the bank before failure.

<sup>67</sup> Neither the Call Report nor the Thrift Financial Report break out secured and unsecured borrowing. Thus any proposals that treat these classes of credits differently would involve additional regulatory burden. Only the Call Report requires a reasonably accurate estimate of uninsured domestic deposits. Thus, there would be an additional regulatory burden for thrifts if insured and uninsured deposits were treated differently for assessment purposes.

similar to redefining the assessment base to domestic deposits plus 50 percent of secured credits.<sup>68</sup> Another way to incorporate liability structure into the FDIC's pricing would be to use a "scorecard" approach that includes liability structure items.<sup>69</sup> Using these types of methods would allow the FDIC to adjust its pricing policy gradually, giving banks time to adjust to a new policy. Depending on the specific proposal, the potential benefits and costs of this option could be quite similar to those for changing the assessment base.

### *B-3. Price Directly for Risk*

One could jettison the assessment base altogether and, instead, base the dollar amount of each assessment on the FDIC's risk of loss from each bank. This has theoretical appeal, since pricing directly for the FDIC's risk exposure could minimize distortions in the market and cross-subsidization across banks. However, it would require that the FDIC calculate its risk of loss for each insured institution with a reasonable degree of accuracy. To do so, the FDIC would have to measure the riskiness of the bank's assets (no matter how opaque), the strength of bank management, the reactions of creditors were the bank to fail, and the effects of market discipline on the bank. Such an exercise might not be feasible or economical. And, it would tend to conceal assessment price differences across banks because of the wide variation in bank sizes.

### *C. Complications Arising from Large Banks*

Because large banks rely on nondeposit funding sources far more heavily than small banks, any potential change to the FDIC's pricing policy related to bank liabilities could have a

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<sup>68</sup> For banks with no secured credits, this method would not change the assessment rate. For banks with secured credits that equaled domestic deposits, this would result in a 50 percent increase in assessments. To remain revenue-neutral, the base assessment rates would have to be adjusted.

<sup>69</sup> For a discussion of scoring systems, see FDIC (2000), 56.

profound effect on large banks and thrifts, as well as on the distribution of deposit insurance costs across the banking industry. Therefore, issues related to bank size should be an integral part of any policy debate on this topic.

These issues are further complicated by recent merger activities among the nation's largest banks. The industry now has a few banks that are far larger than anything the United States has previously experienced. Some economists have suggested that these megabanks will be less likely to fail because they are more diversified. A review of historical experience may not adequately capture the FDIC's loss exposure for this new type of bank.<sup>70</sup> In addition to average loss experience, these megabanks introduce other insurance issues that may influence insurance prices.

#### *C-1. Historical Loss and Failure Experience*

This section documents significant differences in the FDIC's historical loss experience for large and small banks. The appendix provides details on the calculations.

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<sup>70</sup> Note that they also fail to capture the effects of regulatory changes over time. For example, most of the experience pre-dated certain policy changes in FDICIA that were intended to reduce FDIC losses.

C-1-a. Failure Rates

Table 6 provides inflation-adjusted failure rates by asset size.

**Table 6**  
**Annual BIF Failure Rates: 1934–2000**  
**by Real (Inflation-Adjusted) Asset Size Class**

Decade	No. of Years	≤\$100M	>\$100M, ≤\$250M	>\$250M, ≤\$500M	>\$500M, ≤10B	>\$10B	All Banks
1930s *	6	0.48%	–	0.03%	–	–	0.38%
1940s *	10	0.09%	0.01%	–	–	–	0.07%
1950s *	10	0.03%	–	–	–	–	0.02%
1960s *	10	0.04%	0.01%	0.02%	–	–	0.03%
1970s *	10	0.06%	0.01%	0.13%	0.11%	0.36%	0.06%
1980s	10	0.90%	0.49%	0.71%	0.81%	0.70%	0.81%
1990s	10	0.40%	0.29%	0.52%	0.59%	0.44%	0.40%
2000	1	0.10%	0.05%	–	–	–	0.07%
Total	67	0.27%	0.12%	0.21%	0.23%	0.22%	0.24%

\* The denominators were estimated for 1934–1971. See the appendix for details.

Over the history of the FDIC, failure rates have been similar for all asset classes except banks between \$100 million and \$250 million, which exhibited substantially lower failure rates than all other asset size classes. Small banks (defined as under \$100 million in assets in year-end 2000 dollars) had the highest failure rate over the history of the FDIC, and they failed at or above the average rate each decade. The failure rates for the two largest asset size classes were relatively volatile. From 1934 through 1971, there were no failures within these size classes.<sup>71</sup> During the 1970s, they had much higher failure rates than smaller banks. In the 1980s and 1990s, the large-bank failure rates were close to the average failure rate.

Oshinsky calculated the failure rate for three groups of banking companies (rather than individual banks) from 1934 to 1997 and found that the failure rate for the top 25 banking companies averaged 0.1 percent per year, whereas for all other banking companies it was 0.3

<sup>71</sup> Naturally, there were fewer banks in these strata during the earlier period than there are today. At year-end 1972, there were 28 banks in the top stratum and 515 banks in the second-largest stratum. The sizes of the estimated strata in earlier decades were assumed to be similar to the 1972 figures. As of September 2000, there were 83 banks in the top stratum and 690 banks in the second-largest stratum.

percent.<sup>72</sup> This finding indicates that the very largest banking companies in the country tend to fail less often than other large or small banks. There could be a number of reasons for very large banks to fail less frequently. Very large banks tend to be more geographically diverse and thus are less vulnerable to local economic distress. Very large banks may be less vulnerable to fraud, since it would require a more substantial level of fraud to exhaust the capital of a large bank.<sup>73</sup> And, banking regulators may work harder to prevent the failure of a very large bank.<sup>74</sup>

*C-1-b. Loss Rates*

Table 7 presents simple average loss rates for failures from 1980 to 2000.<sup>75</sup>

**Table 7**  
**Loss Rates by Real (Inflation-Adjusted) Asset Size Class**  
**1980–2000**

Size Stratum	No. of Failures	Loss Rate
<=\$100M	1,235	22.4%
\$100M–\$250M	191	17.4%
\$250M–\$500M	94	17.7%
\$500M–\$10B	106	13.9%
>\$10B	5	5.6%
Total	1,631	

Loss rates show a strong relationship to asset size, with small banks experiencing much higher loss rates than large banks.<sup>76</sup> The magnitude of these differences across asset size classes provides support for incorporating asset size into the FDIC’s pricing policy.

<sup>72</sup> Oshinsky (1999a), 6. He calculated the failure rate separately for the top 100 banks outside the top 25 (i.e., 26–100) and for all other banks; the rate was essentially the same for these two groups of banks.

<sup>73</sup> Note, however, that some very large banks have failed because of fraud. Examples include Bank of Credit and Commerce International (BCCI) in 1991 and U.S. National Bank in 1973.

<sup>74</sup> The treatment of certain money-center banks during the less-developed-country debt crisis in the early 1980s may be an example of this. See FDIC (1997), chapter 5, for details.

<sup>75</sup> Loss rates by institution are not available before 1980.

*C-1-c. Insurance Costs*

Oshinsky found that, under the current system, very large banks pay considerably more in premiums than the FDIC spends on resolutions of very large banks; the opposite holds true for small banks. He grouped institutions by the asset size rank of the banking company as of year-end 1998, and his results are shown in Table 8.<sup>77</sup>

**Table 8**  
**Estimated FDIC Failed-Bank Losses per Dollar of Assessment Income**

Asset Size Rank of Banking Co.	FDIC Loss per Dollar of Assessment Income
Top 25	\$0.29
26–100	\$0.87
All Other	\$1.96

For each assessment dollar collected from the top 25 banking companies, Oshinsky estimated that the FDIC spends only 29 cents on resolution costs. For small banks (defined as banks outside the top 100 banking companies), the FDIC spends an estimated \$1.96 on resolutions for each dollar collected in assessment income.<sup>78</sup> This difference is substantial.

There are, however, a number of reasons why it may be reasonable to expect very large banks to shoulder a disproportionate portion of the cost.

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<sup>76</sup> In fact, the reported loss rates may tend to underestimate the difference between small- and large-bank losses because they are calculated as the difference between the FDIC's initial outlay and the FDIC's undiscounted recoveries from the receivership. Thus the FDIC's holding costs are excluded from the loss figures. Holding costs tend to be higher for small banks because the FDIC historically has passed fewer assets to small-bank acquirers than to large-bank acquirers.

<sup>77</sup> Oshinsky (1999b). He adjusted the year-end 1998 figures to incorporate mergers that had been announced through June 1999. To simplify the calculations, he assumed that all banks paid the I-A assessment rate. These figures are calculated from figures in the memo and associated workpapers.

<sup>78</sup> Oshinsky (1999b). The author notes that the difference between large and small banks may be understated because his methodology assumes that all losses are paid through regular assessments. To the extent that losses were paid via systemic-risk assessments, large banks would pay a higher proportion of the FDIC's assessment income.

### *C-2. Concentration Risk*

If the BIF were to become severely troubled, the distress would very likely be closely tied to one or more large-bank failures. Oshinsky studied the effects of banking consolidation on the solvency of the BIF and concluded that:

“Merger activity in the 1990s appears to have increased the risk to the BIF. Moreover, the health of the BIF has become more and more dependent on the health of the top 25 banking organizations, and future insolvency may be deeper, and harder to emerge from, than in the past.”<sup>79</sup>

In his simulation, he projected a 98.5 percent chance that any future BIF insolvency would involve the failure of a top-25 banking company.<sup>80</sup> Although the probability of failure and the anticipated loss rate at failure tend to be low for very large banks, their sheer size threatens the solvency of the insurance funds. When private insurance companies face concentration risk to this degree, they may choose to exit the business rather than take on the risk.<sup>81</sup> This is not a realistic option for the FDIC.<sup>82</sup> Therefore, it would be reasonable for large banks to pay extra for insurance coverage that probably would be unavailable in a private market.

### *C-3. Systemic-Risk Exception*

In 1991, FDICIA introduced a requirement that the FDIC select the resolution method that results in the least cost to the insurance funds. FDICIA allowed that, in rare circumstances,

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<sup>79</sup> Oshinsky (1999a), 20.

<sup>80</sup> *Ibid*, 17.

<sup>81</sup> Oliver, Wyman & Company, LLC (2000) indicated that, under a private deposit insurance system, concentration risk would result in a capital charge to large banks that would be prohibitively expensive. For example, Oliver, Wyman roughly estimated that the capital charge for a \$100 billion bank might be about five to six times expected losses (see 17).

<sup>82</sup> The FDIC is considering the use of re-insurance or other means to reduce its risk exposure.

the Federal Reserve Board, the FDIC, and the Treasury could agree that a least-cost resolution for a failing bank posed a systemic risk.<sup>83</sup> In that case, regulators could declare the bank a “systemic-risk exception,” and the FDIC could provide uninsured depositors and unsecured creditors of the failing bank with a more generous recovery than that which would be available to a typical bank—possibly even a full recovery. The FDIC could even render assistance to the failing bank instead of closing it.

Congress intended that the systemic-risk exception be used rarely, and at this time regulators have never used it. Although the probability of a systemic-risk exception is unknown, it appears that very large banks will be much more likely to qualify for the exception than small- or medium-sized banks. Banks that potentially qualify for a systemic-risk exception receive considerable benefits from the FDIC that the vast majority of banks do not share. If the markets perceive a bank as posing a systemic risk, the bank will be able to raise funds more easily if troubles arise; indeed, markets may even consider a few banks as “too big to fail.” It is reasonable to expect very large banks to pay extra for this privilege.

FDICIA requires that the cost of a systemic-risk exception be recovered via systemic-risk assessments, and the assessment base for these assessments is defined as total assets less tangible equity and subordinated debt. Thus the assessment base for systemic-risk assessments is effectively total liabilities minus subordinated debt. Because large banks rely more heavily on non-deposit funding sources, this provision effectively pushes a larger portion of the cost onto large banks. Therefore, the current funding mechanism already requires that large banks (and wholesale banks in particular) pay more for the systemic-risk exception—but only if a systemic-risk assessment is in fact levied.

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<sup>83</sup> Several requirements must be met before the systemic-risk exception can be used. The details of those requirements are beyond the scope of this paper.

#### *C-4. Candidate Pricing Adjustments Associated with Bank Size*

Either of the first two pricing alternatives (changing the assessment base or adjusting the pricing matrix) could be modified to account for differences related to bank size. For example, to incorporate differences in loss rates between banks of various sizes, a base assessment rate could be used for banks below \$100 million, and discounts could be given to larger banks, based on historical average loss rates for banks within various asset size classes.<sup>84</sup> This change would result in lower assessments for larger banks, but it would not compensate the FDIC for the concentration risk associated with very large banks. To address concentration risk, a separate assessment could be charged only to very large banks, based on each bank's share of industry deposits or assets.<sup>85</sup>

Another possibility would be to adopt a completely separate pricing mechanism for large banks. Recognizing the differences between small and large banks, FDICIA authorized a dual premium system based on bank size. Such a system would enable the FDIC to adopt a more complex pricing mechanism—addressing issues such as concentration risk and the systemic-risk exception—for large banks only.

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<sup>84</sup> For example, assessment rates could be calculated as the base assessment rate multiplied by the ratio of historical loss rate for the bank's asset size class divided by the historical loss rate for banks under \$100 million. To demonstrate the example, assume that banks under \$100 million have an average loss rate of 20%, and banks between \$100 million and \$1 billion have an average loss rate of 15%. Under this system, banks under \$100 million would pay the base assessment rate, and banks between \$100 million and \$1 billion would pay 75% (15/20) of the base assessment rate. Of course, the base assessment rate would have to be set to ensure revenue-neutrality. Note that Oliver, Wyman & Company LLC (2000) recommended that differences in loss severity be included in the price of deposit insurance (although the company did not recommend any specific method for capturing these differences).

<sup>85</sup> Oliver, Wyman & Company, LLC (2000) describes a possible charge for concentration risk in its discussion of the components of a private insurance system. The company noted that private insurers would require very high capital levels to ensure that they could absorb losses if a huge bank failed. To cover the cost of maintaining a large capital cushion, banks would be charged for the size of the capital cushion required for the insurance fund to absorb losses from the bank's failure. The capital charge would fall disproportionately on very large banks. As mentioned above, the company roughly estimated that the capital charge for a \$100 billion bank might be about five to six times expected losses (p. 17), and indicated that the cost would be prohibitively expensive. The FDIC could consider adding a capital charge to its pricing, but at a lower level than private industry would charge.

## V. Summary and Conclusions

Over the last 30 years, the banking industry has become less reliant on domestic deposits for funding. As of year-end 2000, domestic deposits made up only 55.6 percent of total assets—far below the 80 percent or more experienced by banks during the first few decades of the FDIC's existence.

To evaluate the effects of this change on the FDIC's risk exposure, I reviewed the existing literature and considered the incentives and options of nondeposit creditors. I found that small volumes of nondeposit credits result in a slight increase in the FDIC's risk exposure because the reduction in assessment income from a smaller assessment base is not offset by a reduction in loss exposure. The same phenomenon occurs on a larger scale when the volume of secured credits increases. In fact, there is some evidence that a bank's use of secured credits may increase the bank's appetite for risk, thereby further increasing the FDIC's risk exposure.

When a bank holds large volumes of unsecured credits, the FDIC's lost assessment income is offset by various benefits associated with the market discipline that unsecured creditors impose on the bank. Because the offsetting effects are difficult to measure, the net effect of large amounts of unsecured credits on the FDIC is unclear. When banks increase their reliance on uninsured deposits, the FDIC's risk exposure improves because it receives more assessment income plus the benefits associated with market discipline.

The FDIC could change its pricing policy to improve the alignment between bank liability structure and the FDIC's risk exposure. Three options are discussed above:

1. Change the assessment base so that it includes secured credits, insured deposits, and perhaps some portion of at-risk credits (excluding subordinated debt).
2. Adjust prices so they better reflect the risk associated with bank liability structure.
3. Drop the assessment base altogether and price directly for the FDIC's risk exposure.

A number of issues complicate the use of such methods to improve the FDIC's pricing policy. In particular, large banks tend to rely more heavily on nondeposit funding sources than small banks. Therefore, changes that address the risks associated with nondeposit funding sources will shift the cost of deposit insurance away from small banks and toward large banks. However, the FDIC's current pricing policy already places a higher burden on large banks than on small banks—at least in terms of expected losses to the insurance funds per dollar of assessments. The current pricing matrix is roughly based on a bank's probability of default; it does not incorporate differences in loss severity across banks. Historically, the FDIC has consistently experienced significantly lower loss rates from large-bank failures than small-bank failures. By excluding loss severity from the pricing matrix, the current policy tends to place a relatively heavy burden on large banks. However, other issues related to very large banks may justify higher assessments. For example, very large banks impose concentration risk on the FDIC, and they may benefit from the market's perception that they are "too big to fail."

There are no simple remedies for improving the alignment between the FDIC's pricing policy and its risk exposure from the changes occurring in the banking industry's liability structure. Because bank size and liability structure are correlated, it would be unwise to make

adjustments to the FDIC's pricing policy for bank liability structure in isolation. Instead, a holistic approach is warranted, considering numerous factors such as:

- The FDIC's risk exposure (including bank size and the potential of large banks to render the BIF insolvent)
- Fairness across insured institutions (including the relative benefits of a systemic-risk determination for large and small banks) and across depositors
- The appropriate role of the assessment base
- The effects of the policy on market efficiency, both in the short term and in the long term
- Robustness of the pricing policy
- Regulatory burden imposed on the banking industry
- Measurability
- Ability of insured institutions to make adjustments solely to avoid assessments.

The analysis in this paper provides a starting point for considering options, but further study would be beneficial. For example, it would be useful to develop one or more specific policy proposals and weigh the merits of each—from the perspective of both the FDIC and the banking industry. To facilitate analysis and track changes in the FDIC's risk exposure, banking regulators should consider requiring banks to report secured and unsecured credits on the Call Report. The FDIC might also profit from analysis of the motivation for banks to change liability structures, so that it could better gauge the likelihood that changes in bank funding will continue.

## Appendix

### Calculation of Historical Loss and Failure Experience

#### Historical Failure Rates

We began by collecting data on BIF failures from 1934 through 2000. For each failed bank, we calculated total assets in year-end 2000 dollars.<sup>86</sup> For 1972 through 2000, we used these figures to stratify the failed banks into asset size categories. We calculated the number of open banks in each size class using the same technique. For each asset size class, the failure rates were calculated as total failed banks in the asset size class divided by the average number of banks in the asset size class.<sup>87</sup> For 1934 through 1971, the asset size data for each open bank were not readily available. Therefore, we estimated the number of banks in each asset size class by assuming that the proportion of banks in each size class did not change between 1934 and 1972.

#### Historical Loss Rates

Loss rates are available by bank only from 1980 forward. These were calculated as FDIC losses divided by total assets of the bank. Failed banks were placed into asset size strata on the basis of total assets as of the quarter before failure, in year-end 2000 dollars. The Gross Domestic Product (GDP) deflator was used to adjust for inflation.

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<sup>86</sup> For 1947 through 2000, we used the Gross Domestic Product (GDP) deflator. For 1934 through 1947, we used the Consumer Price Index (CPI) because the GDP deflator was not available.

<sup>87</sup> Again, the GDP deflator was used for 1947–2000 and the CPI for 1934–1947. For 1973–2000, the size of each bank was calculated as the average over the year, adjusted for inflation. For 1972, the year-end 1972 stratification was used because year-end 1971 data were unavailable.

## **Insurance Cost per Assessment Dollar**

Oshinsky estimated the amount of FDIC resolution costs per dollar of assessments collected from three groups of institutions. Using a Monte-Carlo simulation, he estimated assessment premiums, failures, and FDIC losses from failures over a 50-year time horizon, based on historical failure rates and loss rates (over the life of the FDIC) for banking companies by stratum, coupled with the current pricing policy.<sup>88</sup>

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<sup>88</sup> Oshinsky (1999b). The model used for the simulations is discussed in more detail in Oshinsky (1999a).

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