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The Effects of Legislating Prompt Corrective Action on the Bank Insurance Fund

THE FEDERAL DEPOSIT Insurance Corporation Improvement Act of 1991 (hereafter, FDICIA) authorized more federal government funds for the Federal Deposit Insurance Corporation and made major changes in the supervision and regulation of depository institutions. One section of FDICIA requires supervisors to take prompt corrective action when an institution's capital ratio falls below the required level.[1] Banks that are classified as well-capitalized or adequately capitalized are subject to the fewest constraints on their activities (see table 1). Supervisors are required to impose limits on the activities of banks with relatively low capital ratios and to close them promptly if their capital ratios fall below some critical level. Some examples of the constraints on poorly capitalized banks include limits on their asset growth, dividends and various insider transactions.

As FDICIA states, the purpose of prompt corrective action is "to resolve the problems of insured depository institutions at the least possible long-term loss to the deposit insurance fund." The legislation is based on the assumption that losses to the Bank Insurance Fund (BIF) would have been lower in recent years if supervisors had acted as required by FDICIA. This paper investigates whether the evidence is consistent with the assumptions that underlie the case for this legislation.

THE CASE FOR LEGISLATING PROMPT CORRECTIVE ACTION

A few years ago, as part of a program to reform the supervision and regulation of depository institutions, several economists began promoting proposals for prompt corrective action (PCA) by supervisors.[2] The report on financial reform by the Treasury Department in February 1991 included a version of these early proposals.[3] The General Accounting Office recommended a su-

[1]The legislation applies to the supervisors of commercial banks and thrift institutions. This paper refers exclusively to commercial banks and the effects of their failure on the Bank Insurance Fund. The Federal Deposit Insurance Corporation (FDIC) insures the deposits of banks and savings and loan associations but maintains a separate fund for banks. Banks pay their premiums into the Bank Insurance Fund which then covers any losses when a bank fails.

[2]Brookings Institution (1989) and Shadow Financial Regulatory Committee (1989).

[3]Department of the Treasury (1991), pp. 39-41.

Table 1

Supervisory Actions Applicable to Depository Institutions under Provisions of the FDICIA for Prompt Corrective Action[1]

Capital Category	
Well capitalized or adequately capitalized	**Mandatory Actions** May not make any capital distribution or pay a management fee to a controlling person that would leave the institution undercapitalized. **Discretionary Actions** None
Undercapitalized	**Mandatory Actions** Subject to provision applicable to well capitalized and adequately capitalized institutions. Subject to increased monitoring. Must submit an acceptable capital restoration plan within 45 days and implement that plan. Growth of total assets must be restricted. Prior approval from the appropriate agency is required prior to acquisitions, branching, and new lines of business. **Discretionary Actions** Subject to any discretionary actions applicable to significantly undercapitalized institutions if the appropriate agency determines that those actions are necessary to carry out the purposes of PCA.
Significantly undercapitalized	**Mandatory Actions** Subject to all provisions applicable to undercapitalized institutions. Bonuses and raises to senior executive officers must be restricted. Subject to at least one of the discretionary actions for significantly undercapitalized institutions. **Discretionary Actions** Actions the institution is presumed subject to unless the appropriate agency determines that such actions would not further the purposes of PCA: Must raise additional capital or arrange to be merged with another institution. Transactions with affiliates must be restricted by requiring compliance with section 23A of the Federal Reserve Act as if exemptions of that section did not apply. Interest rates paid on deposits must be restricted to prevailing rates in the region. Other discretionary actions: Severe restriction on asset growth or reduction of total assets may be required. Institution or its subsidiaries may be required to terminate, reduce, or alter any activity determined to pose excessive risk. May be required to hold a new election of its board of directors.

Table 1 (continued)

Supervisory Actions Applicable to Depository Institutions under Provisions of the FDICIA for Prompt Corrective Action[1]

Capital Category	Discretionary Actions
Significantly undercapitalized (continued)	Other discretionary actions (continued)
	Dismissal of any director or senior executive officer and their replacement by new officers subject to agency approval may be required.
	May be prohibited from accepting deposits from correspondent depository institutions.
	Controlling bank holding company may be prohibited from paying dividends without prior Federal Reserve approval.
	May be required to divest or liquidate any subsidiary in danger of becoming insolvent and posing a significant risk to the institution.
	Any controlling company may be required to divest or liquidate any nondepository institution affiliate in danger of becoming insolvent and posing a significant risk to the institution.
	May be required to take any other actions that the appropriate agency determines would better carry out the purposes of PCA.
Critically undercapitalized	**Mandatory Actions**
	Must be placed in receivership within 90 days unless the appropriate agency and the FDIC concur that other action would better achieve the purposes of PCA.
	Must be placed in receivership if it continues to be critically undercapitalized, unless specific statutory requirements are met.
	After 60 days, must be prohibited from paying principal or interest on subordinated debt without prior approval of the FDIC.
	Activities must be restricted. At a minimum, may not do the following without the prior written approval of the FDIC:
	Enter into any material transaction other than in the usual course of business.
	Extend credit for any highly leveraged transaction.
	Make any material change in accounting methods.
	Engage in any "covered transactions" as defined in section 23A of the Federal Reserve Act, which concerns affiliate transactions.
	Pay excessive compensation or bonuses.
	Pay interest on new or renewed liabilities at a rate that would cause the weighted average cost of funds to significantly exceed the prevailing rate in the institution's market area.
	Discretionary Actions
	Additional restrictions (other than those mandated) may be placed on activities.

[1]This description of the mandatory and discretionary supervisory actions under PCA is derived from a proposal by the Board of Governors of the Federal Reserve System in July 1992 to implement the PCA provisions of FDICIA. Other regulations to be adopted by supervisors will make distinctions among institutions based on their capital category, including regulations on brokered deposits and interbank deposits.

pervisory system in which supervisors would be required to act based on certain indicators of the performance and behavior of depository institutions, as well as capital ratios.[4]

Proponents of legislating PCA, including the Treasury and others, have based their case for PCA largely on the *incentive* for banks to assume risk, not on evidence of the behavior of poorly capitalized banks. The recent behavior of savings and loan associations provided most of the evidence that depository institutions assumed greater risk as their capital ratios declined.[5] The following quote illustrates the thinking of PCA advocates:

> As banks approach the point of economic insolvency, they have less and less to lose from pursuing aggressive, high-risk investment strategies in an attempt to return to profitability. The supervisory free rein given undercapitalized thrifts during the 1980s is widely recognized as a leading factor contributing to the cost of resolving insolvent thrifts. Some argue that commercial bank supervision has been far from perfect, too. In this view, banks are allowed to carry assets on their books at unrealistically optimistic values and are not appropriately restrained from high-risk behavior and irresponsible dividend policy.[6]

EVIDENCE ON THE UNDERLYING ASSUMPTIONS

The direct method of determining whether PCA legislation will reduce the BIF's losses is to enact the legislation, then observe BIF losses for several years. Waiting several years to form an opinion about the effectiveness of PCA legislation, however, does not seem the best way. If PCA legislation turns out to be ineffective, we will have wasted valuable time during which more effective reforms could have been doing their job.

This paper takes an indirect approach, specifying the assumptions that underlie PCA legislation and determining whether the behavior of banks before FDICIA's passage supports these assumptions. The case for PCA legislation rests on the assumption that, in recent years, depository institutions assumed greater risk as their capital ratios declined. As poorly capitalized institutions assumed greater risk and failed, they added to the losses of the deposit insurance funds. Advocates of PCA legislation also assume that constraints on bank behavior mandated by PCA legislation will constrain the risk assumed by poorly capitalized institutions.

The evidence that savings and loan associations assumed greater risk as their capital ratios declined, of course, does not necessarily indicate that PCA legislation will reduce the BIF's losses. Commercial bank supervisors may simply have been more effective than the supervisors of savings and loan associations in constraining the risk assumed by poorly capitalized institutions.[7]

Recent studies examine whether poorly capitalized banks have violated the types of constraints that will be imposed under PCA. Gilbert (1991) reported that the behavior of most of the banks with capital ratios below the minimum required level in 1985-89 did not violate such constraints.[8] Large majorities of the banks reduced their assets while undercapitalized, refrained from paying dividends, and restrained loans to insiders. Recent studies of the "capital crunch" report a positive association between the lagged capital ratios of banks and the growth rates of their assets in the current period. These results are consistent with the view that supervisors effectively constrained the asset growth of poorly capitalized banks.[9]

French (1991) found that, through reports by banks and examinations, supervisors were able to detect the weakness of most failed banks several years before failure. In addition, the incidence of paying dividends was lower at poorly capitalized banks than at other banks, and the incidence of capital injections was higher. Horne (1991) presented additional evidence on the association between capital ratios and dividends.

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[4]U.S. General Accounting Office (1991), pp. 59-71.

[5]Barth, Bartholomew and Labich (1989) and Garcia (1988).

[6]Department of the Treasury (1991), pp. X-1 to X-2.

[7]Several studies examine the incentive for poorly capitalized institutions with deposit insurance to assume risk. See Buser, Chen and Kane (1981), Chirinko and Guill (1991) and Keeley and Furlong (1990).

[8]Gilbert (1991) does not report observations on the banks that reduced their assets while undercapitalized. About 53 percent reduced their assets by more than 10 percent while undercapitalized, and about 22 percent reduced their assets by more than 25 percent.

[9]Bernanke and Lown (1991) and Peek and Rosengren (1992a, b).

Some banks paid dividends while their earnings were negative and capital ratios were below required levels, but the proportion of banks paying dividends is positively related to their capital ratios.[10] These studies are consistent with the view that, in recent years, supervisors of commercial banks influenced the behavior of most undercapitalized banks in ways that will be required under PCA legislation. The exceptional cases may be eliminated by PCA legislation.

One argument for PCA legislation is that the sanctions to be imposed on poorly capitalized banks will induce other banks to maintain their capital ratios above minimum required levels, to reduce the chance that they will be subject to the sanctions. The evidence, however, implies that most poorly capitalized banks were subject to the sanctions prior to PCA legislation. That legislation, therefore, is not incentive for banks to raise their capital ratios.

THE EFFECTS OF CAPITAL RATIOS BEFORE FAILURE ON BIF LOSS RATIOS

Even if PCA legislation has a limited impact on the behavior of banks while undercapitalized, it may achieve its basic objective of reducing BIF losses by reducing the length of time banks *remain* poorly capitalized. The length of time a bank operates with a low capital ratio may influence the risk it assumes because it takes time for some non-marketable bank assets to mature before the proceeds can be reinvested in higher-risk categories. By shortening the time banks are permitted to operate with low capital ratios, supervisors will limit their opportunities to act on incentives to assume greater risk.[11] This argument rests on the assumption that there is a positive association between the length of time banks were poorly capitalized before failure and the BIF losses resulting from their failure.

Measuring Capital Ratios Before Failure

To test the hypothesis that ratios of BIF losses to total assets are positively related to the length of time banks were poorly capitalized prior to their failure, one must specify the following: first, a measure of capital, second, a criterion for classifying banks as poorly capitalized, and third, the lag between changes in capital ratios and changes in risk assumed by poorly capitalized banks.[12]

The paper uses two measures of capital: equity and an alternative measure, which adjusts equity for the market value of securities and for nonperforming loans. The criterion for an adequately capitalized bank is specified initially as a capital-to-asset ratio of 5 percent or more. This level is based on the maximum leverage ratio under the new risk-based capital requirements. For banks with relatively poor asset quality, supervisors may specify a minimum ratio of Tier 1 capital (essentially the same as equity for most banks) to total assets as high as 5 percent. The

[10]Horne (1991) reported the results of an equation for predicting the ratio of dividends to assets. In that model, profit rates and capital ratios have positive coefficients.

[11]This paper does not consider all the possible effects of PCA legislation on BIF losses. It is possible that closing banks with low but positive capital ratios will increase BIF losses, for the following reasons: First, some banks eventually would recover with no losses to BIF. It is difficult to estimate the size of this effect with data for periods before FDICIA, since a change in the closure rule may change the behavior of other parties. Shareholders of the banks that ultimately recover may realize that their banks have good prospects and inject capital more quickly than they would have in the past. Second, some theoretical models indicate that an increase in the capital threshold at which banks are closed causes banks with certain characteristics to assume greater risk. See Levonian (1991).

[12]See Bovenzi and Murton (1988) for a description of loss estimates and an analysis of the determinants of FDIC losses from individual bank failures. The sample in this paper excludes savings banks insured by the BIF. Since savings banks hold different types of assets than commercial banks, the determinants of BIF losses for failed savings banks are likely to be different than for failed commercial banks. Thus, the sample includes only failed commercial banks.

A few banks are excluded because they did not report total assets one year before failure and because of other problems with missing data. Sixteen banks are excluded from the sample because they were involved in mergers within two years of their failure dates. Six bank holding companies in Texas had all of their bank subsidiaries closed at the same time, for a total of 88 failed banks. BIF losses attributed to at least some of these banks reflect problems at their affiliates. These 88 banks are excluded from the sample to avoid problems in relating BIF losses to the characteristics of individual failed banks.

Thirty-nine banks were in existence less than three years when they failed. Since new banks tend to have relatively high capital ratios and rapid asset growth, these banks might distort the analysis as outliers in some comparisons. These 39 banks are retained in the sample. Effects of deleting these banks are noted where the difference would affect the description of the data.

analysis in this paper is modified to consider other capital ratios as well.[13]

Advocates of PCA legislation do not specify how quickly they assume poorly capitalized institutions increase their risk after their capital ratios decline. Rather than picking an arbitrary lag, we divide banks into three groups based on the length of time their equity capital ratios were below 5 percent before failure (table 2). Banks in group one had equity capital ratios below 5 percent for five or more consecutive quarters before failure. The choice of this period reflects seasonal patterns in bank accounting practices and capital injections. (Capital injections and accounting entries that recognize loans as losses tend to be clustered in the fourth quarter.) A bank with a relatively low capital ratio for five or more quarters would have a relatively low capital ratio in more than one calendar year, no matter when in the year a bank is declared a failed bank.

Suppose, for instance, that a bank failed in February 1990. If the equity capital ratio of the bank was below 5 percent for five or more consecutive quarters, its ratio would have been below 5 percent at least as early as the fourth quarter of 1988. Thus, as early as then, the shareholders of the bank exhibited their inability or unwillingness to inject the capital necessary to raise the ratio to 5 percent and did not eliminate the capital deficiency in subsequent quarters.

Table 2 also includes an intermediate group of banks that had relatively low equity capital ratios between two and four consecutive quarters before failure (group two). If the groups in table 2 reflect relevant time periods, the arguments for PCA legislation would imply that the BIF loss ratios would be highest for banks in group 1 and lowest for banks in group 3. A comparison of average ratios of BIF losses to total assets at the failure dates does reflect this pattern, but the differences in the mean BIF loss ratios are not statistically significant.

Adjustment for Changes in Assets in the Last Year

The comparisons of the ratios of BIF losses to total assets on the dates of their failure are subject to a bias. The longer capital ratios of banks were below 5 percent before failure, the larger the percentage decline in assets in their last year. Banks with equity capital ratios below 5 percent for five or more consecutive quarters had asset declines, on average, of more than 14.5 percent. The average percentage decline in assets was more than 11 percent for banks with equity capital ratios below 5 percent for two to four consecutive quarters. The other banks, in contrast, had average asset *growth* of about 2.5 percent.

These differences appear to reflect the influence of supervisors, based on the following assumptions. First, supervisors rate the financial strength of banks largely on the basis of capital ratios derived from the report of condition. Second, banks respond to directives from their supervisors to raise capital ratios by reducing assets. And third, the longer a bank is subject to pressure from its supervisor to raise its capital ratio, the larger the percentage decline in its assets.

Data on banks that paid dividends in the year ending on their failure date also appear to reflect the influence of supervisors, adding support to the view that supervisors influenced the asset growth of undercapitalized banks in their last year. Bank regulations restrict dividend payments whenever capital is below the required level.[14] While some undercapitalized banks have violated these regulations, most have foregone dividend payments. Less than 7 percent of the banks with equity capital ratios below 5 percent for five or more consecutive quarters before failure paid dividends in their last year. The proportion of failed banks that paid dividends in their last year is significantly higher for groups of banks with higher capital ratios in their last year.

[13]Spong (1990), pp. 64-71, and Keeton (1989) describe the risk-based capital requirements and maximum leverage ratios.

[14]See Spong (1990), pp. 64-71, for a description of the regulation of bank dividends in the years covered by this study. In general, banks were prohibited from withdrawing or impairing their capital through excessive dividend payouts or other means. Member banks (national banks and state-chartered banks that are members of the Federal Reserve System) were required to obtain regulatory approval to pay dividends that exceeded the sum of net profits for a year and retained earnings for the preceding two years. For any banks with federal deposit insurance, dividend payments that could endanger a bank could be restricted under the general enforcement and cease and desist powers of the federal supervisors. See Gilbert (1991), French (1991) and Horne (1991) for additional information on dividend payments by poorly capitalized banks.

Table 2

Distribution of BIF Loss Ratios by the Length of Time Before Failure That Capital Ratios Were Below 5 Percent, 1985-90

Group number	Characteristics of failed banks	Number of banks	Loss to BIF divided by total assets		Percentage change in total assets in the year ending on failure date	Percentage of banks that paid dividends in the year ending on failure date
			Total assets as of failure date	Total assets one year before failure date		
1	Equity capital ratio below 5 percent for five or more consecutive quarters before failure	374	0.2736 (0.1365)	0.2196 (0.1171)	−14.52 (14.40)	6.42%
2	Equity capital ratio below 5 percent in the last two quarters before failure and up to four consecutive quarters before failure	302	0.2693 (0.1184)	0.2145 (0.1022)	−11.15 (14.07)	25.17
3	Failed banks other than those in groups 1 and 2	178	0.2629 (0.1320)	0.2522 (0.1536)	2.45 (23.47)	44.94
4	Alternative capital ratio below 5 percent for five or more consecutive quarters before failure	546	0.2716 (0.1313)	0.2200 (0.1142)	−13.21 (14.54)	11.17
5	Alternative capital ratio below 5 percent in the last two quarters before failure and up to four consecutive quarters before failure	219	0.2752 (0.1226)	0.2247 (0.1078)	−8.09 (15.97)	33.79
6	Failed banks other than those in groups 4 and 5	89	0.2456 (0.1320)	0.2649 (0.1807)	12.26 (28.23)	50.56
	t-statistics, in absolute value, for differences between means for groups:					
	1 and 2		0.438	0.604	3.064*	6.695*[1]
	1 and 3		0.880	2.506*	8.884*	9.782*
	2 and 3		0.533	2.916*	7.023*	4.406*
	4 and 5		0.360	0.536	4.110*	6.521*
	4 and 6		1.724	2.271*	8.333*	7.203*
	5 and 6		1.820	1.962*	6.397*	2.046*

NOTE: Standard deviatons are in parentheses under means.

[1]t-statistics, in absolute value, for differences in proportions

*Statistically significant at the 5 percent level.

The observations in table 2 are consistent with the view that supervisors forced most banks with persistently low capital ratios before failure to reduce their assets and refrain from paying dividends. Supervisors may have been less aware of the troubles of banks with capital ratios above 5 percent during most or all of their last year, and, therefore, placed less constraint on their behavior.

The higher average BIF loss ratios of the banks undercapitalized for longer periods may reflect sharp declines in assets in their last year, rather than losses on investments in riskier assets. BIF loss ratios can be adjusted for this bias by dividing the losses to BIF by assets one year *before* failure. Average ratios of BIF losses to total assets one year before failure for banks in groups 1 and 2 are significantly *lower* than the average BIF loss ratio of those in group 3. After adjusting for the effects of this bias, the evidence does not indicate a positive association between the length of time banks were undercapitalized before failure and BIF loss ratios.

An Alternative Capital Measure

Advocates of PCA legislation have emphasized the need for improvements in measuring the value of bank capital. Perhaps a positive relationship between BIF loss ratios and the length of time bank capital ratios were low before failure is evident only with an improved measure of bank capital.

Alternative capital measures often are described as "market value" capital, with assets and liabilities marked to market values.[15] Berger, King and O'Brien (1991) indicate the various meanings attached to the term "market value" and the practical difficulties in deriving accurate measures of the market values for some categories of assets and liabilities. The authors suggest, however, the following adjustments to the value of bank assets: adjust marketable assets to market values, and adjust the value of loans for anticipated losses on nonperforming loans.

The following calculations yield an alternative capital measure which reflects these adjustments. The difference between the book and market value of securities is subtracted from equity. Adjustments to equity for anticipated loan losses involve comparisons of allowances for loan and lease losses to the values of nonperforming loans (past due 90 days or longer or nonaccrual). The allowance for loan losses is accumulated earnings of a bank set aside to absorb loan losses.[16] Evidence in Berger, King and O'Brien indicates that a $3 increase in nonperforming loans tends to increase loan losses by $1. If a bank's allowance for loan losses equals or exceeds one-third of its nonperforming loans, there is no adjustment to its equity for anticipated loan losses. The other banks need larger allowances for loan losses to meet this standard. Increases in their allowances would come out of equity. The adjustment to equity involves subtracting one-third of their nonperforming loans and adding their allowance for loan losses.

The results in table 3 add support to use of the three-to-one ratio of nonperforming loans to the allowance for loan losses in deriving the alternative capital measure. Table 3 presents this ratio for banks in various size categories, from one quarter to eight quarters before failure. The ratio is around three for banks of different size and for different lengths of time prior to failure.

Table 3 also has implications for the supervisory treatment of banks as they approach failure. As indicated above, the case for PCA legislation is based on the argument that in recent years supervisors should have done their job differently. For example, supervisors should have forced banks to make their balance sheets reflect more accurately the value of their assets. Supervisors may have allowed troubled banks to show higher equity on their balance sheets than justified by the quality of their assets, by permitting their allowance for loan losses to lag behind the rise in their nonperforming loans as they approached failure. Additions to the allowance for loan losses (called provisions for loan losses) are bank expenses. Thus, additions to the allowance for loan losses reduce earnings and possibly equity, if earnings are negative.

Table 3 shows that, while the ratio of nonperforming loans to total assets rose as banks ap-

[15]Mondschean (1992) discusses the issues raised by proposals for market value accounting.

[16]See the appendix for a more thorough discussion of the role of the allowance for loan losses in bank accounting principles.

Table 3

Average Ratios of Nonperforming Loans to the Allowance for Loan and Lease Losses and to Total Assets[1]

Size category of banks (millions of dollars as of failure date)	Quarters before failure							
	1	2	3	4	5	6	7	8
Assets < $25								
NPL ÷ ALLL	2.89	3.07	3.26	3.08	2.93	3.09	2.94	2.95
NPL ÷ TA	0.0777	0.0720	0.0677	0.0608	0.0540	0.0504	0.0431	0.0390
$25 ≤ Assets < $50								
NPL ÷ ALLL	2.68	3.19	3.19	3.03	2.83	2.87	2.72	2.82
NPL ÷ TA	0.0892	0.0803	0.0703	0.0618	0.0539	0.0487	0.0443	0.0392
$50 ≤ Assets < $100								
NPL ÷ ALLL	3.40	2.81	3.06	3.14	3.18	3.02	3.16	3.13
NPL ÷ TA	0.0949	0.0789	0.0717	0.0665	0.0587	0.0552	0.0487	0.0438
$100 ≤ Assets								
NPL ÷ ALLL	3.30	3.21	3.72	3.80	3.41	3.58	3.53	3.55
NPL ÷ TA	0.1049	0.0906	0.0808	0.0704	0.0595	0.0526	0.0495	0.0426

NPL — Nonperforming loans (past due 90 days or more plus nonaccrual)
ALLL — Allowance for loan and lease losses
TA — Total assets

[1]In total, 836 banks filed reports of condition for the quarter ending one quarter before failure and for the preceding seven quarters. The ratios are calculated as the sum of the item in the numerator divided by the sum of the item in the denominator for a given group of banks.

proached failure, their allowances for loan losses also rose proportionately. These results are inconsistent with one type of forbearance by supervisors: a general tendency to permit the allowance for loan losses to lag behind the rise in nonperforming loans, to avoid large charges against equity.

Table 2 presents average BIF loss ratios based on this alternative measure of capital. The adjustments to equity reduce the capital ratios for many of the failed banks in their last year. For instance, the number of banks with capital ratios below 5 percent for five or more consecutive quarters before failure rises from 374 with equity as the measure of capital (group 1) to 546 with the alternative measure (group 4).

BIF loss ratios adjusted for changes in assets in the last year (BIF losses divided by total assets one year before failure) are lower for banks with adjusted capital ratios below 5 percent for longer periods. Use of the alternative capital measure *does not* yield a positive association between the length of time banks operated with low capital ratios before failure and BIF loss ratios.

Alternative Levels of Capital Ratios

Perhaps the difficulty in finding an inverse relationship between capital ratios before failure and BIF loss ratios is that all the results in table 2 are based on a 5 percent capital ratio. The relevant ratio for purposes of the hypothesis tested here may be higher or lower than 5 percent. Table 4 examines the relationship between capital ratios and BIF loss ratios, for a fixed lag of one year between the observation of capital ratios and failure dates. The hypothesis that poorly capitalized banks assume relatively high

Table 4

Distribution of BIF Loss Ratios by the Ratio of Capital to Assets One Year Before Failure

		Equity as the measure of capital		Alternative capital measure	
Group number	Range of capital ratio	Number of banks	BIF loss divided by total assets one year before failure	Number of banks	BIF loss divided by total assets one year before failure
1	$0.10 < C/A$	30	0.2861 (0.2141)	23	0.2898 (0.2364)
2	$0.08 < C/A \leq 0.10$	75	0.2306 (0.1346)	40	0.2523 (0.1575)
3	$0.06 < C/A \leq 0.08$	211	0.2214 (0.1116)	109	0.2179 (0.1064)
4	$0.04 < C/A \leq 0.06$	214	0.2290 (0.1189)	203	0.2281 (0.1112)
5	$0.02 < C/A \leq 0.04$	175	0.2177 (0.1181)	178	0.2344 (0.1300)
6	$0.00 < C/A \leq 0.02$	109	0.2129 (0.1120)	154	0.2000 (0.1054)
7	$-0.01 < C/A \leq 0.00$	15	0.1842 (0.0796)	54	0.2078 (0.1201)
8	$C/A \leq -0.01$	25	0.2458 (0.1034)	93	0.2399 (0.1051)

NOTE: Standard deviations are in parentheses under means.

risk, which imposes large losses on BIF if they fail, implies higher BIF loss ratios for banks with capital ratios below some critical level before failure.

Table 4 indicates that the banks with the highest BIF loss ratios are those with the highest and the lowest capital ratios one year before failure. Among other banks, there is no systematic relationship between the capital ratios of banks one year before failure and their BIF loss using either measure of capital. These results do not support the hypothesis that banks with capital ratios below some critical capital ratio have higher BIF loss ratios.[17]

Extreme Cases — A few banks that engaged in extreme behavior may have imposed large losses on BIF. Thus, PCA legislation could contribute to reducing BIF losses by constraining the extreme behavior of a small minority of failed banks. The data are examined for such extreme cases in two ways. The first approach involves determining whether BIF loss ratios

[17]Banks in existence less than three years when they failed account for the relatively high average BIF loss ratio for banks with capital ratios in excess of 10 percent one year prior to failure. Eight of the 30 banks with equity capital ratios in excess of 10 percent one year prior to failure were in existence less than three years when they failed. Excluding these eight banks reduces the average BIF loss ratio for the remaining 22 banks to 23.72 percent, which is much closer to the average BIF loss ratios for the banks with capital ratios below 10 percent one year prior to failure. Eliminating the banks in existence less than three years when they failed has a similar effect on the average BIF loss ratio of banks with ratios of the alternative capital measure to total assets in excess of 10 percent one year prior to failure.

Table 5
Characteristics of Banks with Relatively High BIF Loss Ratios

Characteristics	Banks with BIF loss ratios above 50 percent	All banks in the sample
Number of banks	44	854
Mean percentage change in total assets in their last year	−9.13%	−9.79%
Percentage that paid dividends in their last year	20.45	21.08
Percentage with equity capital ratio below 5 percent for five or more consecutive quarters before failure	54.55	43.79
Percentage in the West South Central region	75.00	56.21
Percentage supervised by the Office of the Comptroller of the Currency	56.82	37.70

were relatively high among banks that engaged in extreme behavior. These banks would have the following characteristics: equity capital ratio below 5 percent for five or more consecutive quarters before failure, and asset growth and dividend payments in their last year. No banks in the sample had this combination of characteristics.

The second approach involves examining the characteristics of banks with relatively high BIF loss ratios, to determine whether they exhibited extreme behavior that will be constrained under PCA. Table 5 presents some of the characteristics of 44 banks with BIF loss ratios that exceed 50 percent. Their mean asset growth and the proportion paying dividends in their last year are almost identical to those for the entire sample. The banks with relatively high BIF loss ratios do have a somewhat higher percentage with equity capital ratios below 5 percent for relatively long periods before failure. It is possible, however, to find other ways in which these banks are even more distinct from the entire sample. Their relatively high loss ratios may reflect regional effects: three-fourths were located in the West South Central region of the nation, compared with about 56 percent for the entire sample.[18] A relatively high proportion were supervised by the Comptroller of the Currency. Thus, an examination of extreme cases does not provide clear evidence of the effectiveness of PCA in reducing BIF losses.

REGRESSION ANALYSIS

Loss ratios vary substantially within each of the groups of banks in tables 2 and 4; standard deviations are about half as large as their means. Perhaps an inverse relationship between capital ratios before failure and BIF loss ratios is evident only if other factors are held constant in regression analysis.

A Description of Banks in the Regression Analysis

The 854 banks in the sample failed in the years 1985-90 (table 6). Most banks were relatively small: about 60 percent had total assets

[18]States in this region are Arkansas, Louisiana, Oklahoma and Texas.

Table 6

Characteristics of Failed Banks in Regression Analysis

Year of failure	Number of banks	Percentage
1985	112	13.1%
1986	132	15.5
1987	175	20.5
1988	146	17.1
1989	149	17.4
1990	140	16.4
Total	854	100.0
Asset size on failure date (millions of dollars)		
Assets < $25	508	59.5
$25 ≤ Assets < $50	209	24.5
$50 ≤ Assets < $100	90	10.5
$100 ≤ Assets	47	5.5
		100.0
Region		
New England (NE)	5	0.6
Middle Atlantic (MA)	9	1.1
South Atlantic (SA)	19	2.2
East South Central (ESC)	17	2.0
West South Central (WSC)	480	56.2
East North Central (ENC)	16	1.9
West North Central (WNC)	174	20.4
Pacific Northwest (PNW)	34	4.0
Pacific Southwest (PSW)	100	11.7
		100.1
Federal supervisor		
OCC	322	37.7
Federal Reserve	68	8.0
FDIC	464	54.3
		100.0
Method of resolving failure		
Purchase and assumption	667	78.1
Transfer of insured deposits	115	13.5
Liquidation	72	8.4
		100.0

NOTE: States in census regions:

New England: Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island and Vermont

Middle Atlantic: New Jersey, New York and Pennsylvania

South Atlantic: Delaware, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia and West Virginia

East South Central: Alabama, Kentucky, Mississippi and Tennessee

West South Central: Arkansas, Louisiana, Oklahoma and Texas

East North Central: Illinois, Indiana, Ohio, Michigan and Wisconsin

West North Central: Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota and South Dakota

Pacific Northwest: Alaska, Idaho, Montana, Oregon, Washingon and Wyoming

Pacific Southwest: Arizona, California, Colorado, Hawaii, Nevada, New Mexico and Utah

less than $25 million, and about 95 percent had total assets less than $100 million. The failed banks were heavily concentrated in certain regions. About 56 percent were in the West South Central region. About 78 percent of the cases were resolved when other banks bought some of the assets of the failed banks and assumed their liabilities. In another 14 percent of the cases, the FDIC transferred the insured deposits of failed banks to other banks. In these cases, the FDIC liquidated the failed banks' assets and made partial payments to uninsured depositors, based on the proceeds of liquidated assets. Failed banks were liquidated in the remaining cases.

Identifying the Variables

The dependent variable is the ratio of BIF loss to total assets as of failure date.[19] Independent variables are described in table 7.

Capital Ratios — The case for applying PCA legislation to the supervisors of commercial banks implies negative, significant coefficients on the capital ratios lagged one year, EC_{-4} and AC_{-4}.

Asset Growth — The coefficient on GROWTH is assumed to have a negative sign: an increase (decrease) in assets in the last year is assumed to increase (decrease) the denominator of the BIF loss ratio, while having little, if any, effect on the size of the BIF loss.

Dividends — Arguments for legislating PCA imply a positive sign for the coefficient on DIV: dividends in the last year, divided by total assets as of failure date. The coefficient on DIV may be positive for two reasons. First, dividends are payments of capital to shareholders, leaving less capital to absorb reductions in the value of assets. Second, dividends may be a signal that the shareholders saw little reason to attempt to prevent failure. Instead, they may have paid out capital in anticipation of failure. These reasons, however, do not account for possible influences of supervisors over which banks paid dividends or the size of their dividend payments.

Quality of Bank Loans — One measure of loan quality is the value of loans that are past due or nonaccrual. A second measure is the value of interest accrued on loans that was not collected. When borrowers fall behind on their scheduled payments, banks continue to accrue the interest due from them as income until their loans are classified as nonaccrual.[20]

These measures of loan quality may help explain the BIF losses from the failure of individual banks. The following two measures of asset quality are included as independent variables:

1. NPL — the ratio of nonperforming loans to total assets.
2. ACCRUED — interest accrued on loans that was not collected, divided by total assets.

The coefficients on these variables will have positive signs under the following assumptions: First, these measures accurately reflect loan quality. Second, the allowance for loan losses is not large enough to cover the gap between the book value of these loans and their value to the FDIC as the receiver of failed banks.[21]

Market Value of Securities — Securities (various types of bonds) are reported on bank balance sheets at book values (purchase prices plus any amortized changes in value), not at their current market values. Thus, the book value of equity reflects the book value of securities. Banks also report information on the market value of their securities on the report of condition. The following independent variable is a measure of the gap between the book and

[19]Avery, Hanweck and Kwast (1985) report the results of regressions with the same dependent variable. It is difficult to compare the results in this paper to those, since their objective was to predict FDIC losses from bank failures, not to test hypotheses about coefficients on independent variables. They do not attempt to adjust the specification of equations for possible collinearity. In Bovenzi and Murton (1988) and James (1991), the dependent variable is the loss on assets of failed banks, a concept that is related to BIF loss. Some of the independent variables in Bovenzi and Murton and in James are included, with slight modifications, in this study; the major difference involves measures of asset quality derived from examination reports, which are not included in this study. Barth, Bartholomew and Labich (1989) and Barth, Bartholomew and Bradley (1990) estimate the coefficients of equations designed to explain the cost to the Federal Savings and Loan Insurance Corporation of resolving cases of failed savings and loan associations. Results in Barth, Bartholomew and Bradley are not comparable to those in this study, since they include observations for failed and surviving associations and use a different statistical technique (Tobit regression analysis).

[20]Accrued interest that was not collected may not reflect default by borrowers on scheduled loan payments. In some loan contracts, such as construction loans, the original loan contract specifies a delayed schedule of interest payments.

[21]See the appendix for a discussion of accounting principles which features the role of the allowance for loan losses.

Table 7
Identification of Independent Variables

EC_{-4}	Ratio of equity capital to total assets four quarters before failure.
AC_{-4}	Ratio of the alternative capital measure to total assets four quarters before failure.
GROWTH	Change in total assets of failed bank in its last year, divided by total assets as of failure date.
DIV	Dividends on common stock paid in the year ending in failure, divided by total assets as of failure date.
NPL	Loans and leases past due 90 days or more, plus nonaccrual loans, divided by total assets as of failure date.
ACCRUED	Interest on loans that was accrued but not received on the last report of condition, divided by total assets as of failure date.
MARKET	Book value of securities in the investment account as of the last report of condition, minus the market value of the securities, divided by total assets as of failure date.
IDR	Last observation available on deposits in accounts up to $100,000 each, divided by total assets as of failure date.
P&A	Dummy variable with a value of unity if a failed bank case was resolved through purchase and assumption, zero otherwise.
TID	Dummy variable with a value of unity if a failed bank case was resolved through transfer of insured deposits to another bank, zero otherwise.
OCC	Dummy variable with a value of unity if the bank was a national bank, supervised by the Office of the Comptroller of the Currency, zero otherwise.
FR	Dummy variable with a value of unity if a bank was supervised by the Federal Reserve, zero otherwise.
lnA	Natural log of total assets as of failure date.
1985-1989	Dummy variables for the years in which the banks failed.
NE, MA, SA, ESC, ENC, WNC, PNW, PSW	Dummy variables for the regions in which failed banks were located.

market value of securities: MARKET — the book value minus the market value of securities, divided by total assets.

The expected sign of the coefficient on MARKET depends on the conditions under which supervisors close banks. Suppose they close banks when the book value of equity is zero or negative, without adjustments to the book value of equity for the market value of assets. Under this assumption, the expected sign on MARKET is positive: BIF losses would be related positively to the gap between the book value and the market value of securities.

Methods of Resolving Failed Banks — When a bank fails, the FDIC becomes the receiver. As receiver, the FDIC must dispose of the failed bank's assets and make payments to its creditors. The options chosen to resolve each case may affect the BIF's losses. Those choices, in turn, may reflect additional information about failed banks not captured by the other independent variables, such as characteristics of the

customers of failed banks that make them valuable to other banks.[22]

One method of resolving failed bank cases is *liquidation*. Failed banks are closed and depositors are paid off up to the insurance limit per account. The FDIC liquidates the assets and makes payments to uninsured depositors and other creditors of the failed bank. Shareholders generally get nothing.

Resolution methods other than liquidation may be less expensive to BIF. In many cases, a solvent bank purchases some of the assets of a failed bank and assumes its liabilities. The FDIC provides cash to cover the gap between assets purchased and liabilities assumed. This is called a *purchase and assumption* (P&A) transaction. The FDIC solicits bids from solvent banks for the assets and liabilities. Banks bid by offering premiums; the cash payment by the FDIC to the bank with the winning bid is net of the premium. The FDIC generally disposes of failed banks through P&A transactions if its staff estimates that the losses would be lower than under liquidation.[23] As a result, the variable P&A (dummy variable for banks resolved through P&A transactions) is expected to have a negative coefficient.

In some cases, the FDIC liquidates the assets of failed banks but solicits bids from other banks to assume their insured deposits. Bidders may anticipate long-term profits on the accounts of customers who choose to keep their deposits with the winning bidder. This method of disposing of failed banks is called *transfer of insured deposits* (TID). The independent variable TID (dummy variable for bank failure cases resolved through TID) is expected to have a negative coefficient.

Share of Deposits Fully Insured — James (1991) found a positive association between the premiums paid by the winning bidders in P&A cases and the shares of deposits of failed banks that were fully insured (accounts in denominations of $100,000 or less). The smaller accounts tend to be more profitable to banks because banks pay less than market interest rates on them.[24]

The variable IDR (fully insured deposits divided by total assets) is included to reflect the composition of deposits. It is expected to have a negative coefficient because premiums paid to the FDIC by winning bidders are assumed to be positively related to IDR. An increase in the premium reduces the loss to BIF.

Federal Supervisory Agency — The primary supervisor of nationally chartered banks is the Office of the Comptroller of the Currency (OCC). For state-chartered banks that are members of the Federal Reserve System, the Federal Reserve is the primary federal supervisory agency, while, for other state banks, it is the FDIC. Differences in supervisory practices among these agencies may affect BIF losses. Dummy variables (OCC and FR) are used to capture such effects.

Bank Size — BIF loss ratios may be higher for smaller banks for two reasons. First, James (1991) finds that FDIC administrative costs are higher, per dollar of assets, for smaller failed banks.[25] Second, smaller banks may be subject to less frequent examination and less thorough surveillance between examinations than larger banks. When supervisors discover that relatively small banks are bankrupt, the percentage losses on assets may be larger than when larger banks fail. The bank size variable is the natural log of total assets as of failure date.

Location and Year of Failure — The remaining independent variables are dummy variables for the regions of failed banks and the years in which they failed, since BIF loss ratios may vary systematically by region and year of failure.

Regression Results

Table 8 presents the regression results. The equations use different measures of capital in the lagged capital ratio.

Lagged Capital Ratios — The coefficients on capital ratios four quarters before failure are not statistically significant. Other measures yield the same result. In other regressions not reported here, the coefficients on dummy variables

[22]The appendix examines in more detail how resolution methods affect BIF losses.

[23]For a discussion of the conditions for disposing of failed banks through P&A transactions, see Federal Deposit Insurance Corporation (1984), pp. 81-108, Bovenzi and Muldoon (1990) and Department of the Treasury (1991), pp. I-30 through I-51.

[24]See Brunner, Duca and McLaughlin (1991) for information on the rates banks pay on various types of deposit accounts.

[25]James (1991), pp. 1234-36.

for banks with capital ratios below 5 percent for various lengths of time before failure also are not statistically significant.[26]

The coefficients on the variables designed to reflect capital ratios before failure may be biased toward zero by including independent variables that reflect the quality and market value of bank assets. To illustrate, suppose the banks with persistently low capital ratios shifted their assets to high-risk categories as they approached failure, resulting in high ratios of nonperforming loans to total assets on their last reports of condition. In addition, suppose these banks sold securities with capital gains and kept securities with capital losses to boost the book value of equity as they approached failure. This selective pattern of securities sales would make values of the variable MARKET relatively high at the banks with persistently low capital ratios. The effects of low capital ratios before failure on BIF loss ratios would be captured to some extent in the coefficients on NPL, ACCRUED and MARKET. To test for this bias, equations 1 and 2 of table 8 were estimated without the variables NPL, ACCRUED and MARKET. In results not reported here, the coefficients on capital ratios before failure were not statistically significant.

Other Independent Variables — The coefficient on GROWTH is negative, as hypothesized. The coefficient on DIV is negative and insignificant; advocates of PCA legislation implied it would have been positive.

The coefficients on NPL and ACCRUED are significant with the positive signs, as hypothesized. The coefficient on MARKET is significant but the sign is opposite of that hypothesized: a wider gap between the book value and market value of securities is associated with a lower BIF loss.

The negative, significant coefficient on IDR indicates that failed banks with higher ratios of fully insured deposits to total assets are more valuable to potential bidders, thus tending to reduce BIF loss ratios. The coefficient on P&A indicates that BIF loss ratios are lower in P&A cases than in liquidation cases, holding other variables constant.[27] BIF loss ratios are not significantly lower in TID cases. The coefficient on OCC is positive and statistically significant. Holding constant the influences of the other independent variables, BIF loss ratios are about 2 percentage points higher for failed banks with national charters.[28] The coefficient on FR indicates that, among state-chartered banks, there is no significant effect of Federal Reserve membership on loss ratios, holding constant the other independent variables.

The coefficient on the natural log of assets is not statistically significant. In other regressions not reported here, dummy variables for banks in various size ranges also were not significant. The results do not support the hypothesis that BIF loss ratios are larger for smaller banks, holding constant other determinants of BIF loss ratios.

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[26]The most comparable results for S&Ls are in Barth, Bartholomew and Labich (1989). In a regression equation with costs of resolving failed S&Ls as the dependent variable, tangible net worth on the last quarter reported is a highly significant variable. The coefficient is negative unity (a $1 increase in capital reduces resolution costs by $1), with a t-statistic of 13.9. Another significant variable is the number of months an association was insolvent before failure, which has a positive coefficient. The contrast of the results in this paper to those in Barth, Bartholomew and Labich is consistent with the view that the supervisors of commercial banks were more effective in limiting the risk assumed by poorly capitalized institutions than the supervisors of S&Ls.

[27]Bovenzi and Murton (1988) find that, without holding other factors constant, BIF loss ratios were about 7 percentage points lower in P&A cases than in liquidation cases in 1985-86. The coefficient on P&A in table 8 indicates about the same effect.

[28]Gilbert (1991) found differences in the behavior of banks in Texas with national charters and those with state charters that could be interpreted as evidence of differences in practices among the federal supervisory agencies. National banks were allowed to operate with capital ratios below the minimum capital requirement for longer periods than state-chartered banks, and national banks accounted for almost all of the Texas banks that operated at least a year with negative equity. The undercapitalized banks in Texas with rapid assets growth and those with higher insider loans while undercapitalized tended to be national banks. Most of these differences between national and state-chartered banks were not statistically significant outside Texas.

These contrasts might indicate that the positive, significant coefficients on OCC in table 8 reflect differences between national and state-chartered banks in the Southwest. To test for such a regional effect, the regressions in table 8 were estimated separately for banks in the states covered by the Dallas office of the OCC (Arkansas, Louisiana, New Mexico, Oklahoma and Texas) and for banks in other states. In each regression, the coefficient on OCC was positive but not significant at the 5 percent level. The coefficient on OCC was larger, however, in the regressions for banks in states outside the Southwest and significant at the 10 percent level. Thus, the effect on BIF loss ratios of supervision by the OCC is not restricted to the Southwest.

Table 8

Determinants of Bank Insurance Fund Losses Due to Individual Bank Failures

Dependent variable: Bank Insurance Fund loss divided by total assets as of failure date

Independent variables	Regression Number 1	Regression Number 2	Independent variables	Regression Number 1	Regression Number 2
Intercept	0.3539 * (5.69)	0.3495 * (5.69)	1985	−0.0207 (1.18)	−0.0200 (1.16)
EC_{-4}	−0.0324 (0.22)		1986	−0.0028 (0.18)	−0.0034 (0.22)
AC_{-4}		−0.0021 (0.02)	1987	0.0054 (0.38)	0.0048 (0.33)
GROWTH	−0.0442 * (2.64)	−0.0451 * (2.73)	1988	0.0214 (1.53)	0.0211 (1.50)
DIV	−1.4038 (1.34)	−1.42 (1.37)	1989	0.0255 (1.87)	0.0255 (1.87)
NPL	0.3554 * (4.74)	0.3533 * (4.69)	NE	−0.0544 (1.04)	−0.0550 (1.05)
ACCRUED	3.2125 * (6.22)	3.2210 * (6.24)	MA	−0.0732 (1.86)	−0.0732 (1.86)
MARKET	−1.3307 * (2.31)	−1.2988 * (2.25)	SA	−0.0693 * (2.53)	−0.0689 * (2.51)
IDR	−0.0855 * (3.50)	−0.0848 * (3.46)	ESC	−0.0883 * (3.04)	−0.0877 * (3.02)
P&A	−0.0656 * (4.40)	−0.0651 * (4.35)	ENC	−0.1069 * (3.60)	−0.1066 * (3.60)
TID	−0.0024 (0.13)	−0.0021 (0.12)	WNC	−0.0904 * (7.29)	−0.0904 * (7.30)
OCC	0.0218 * (2.39)	0.0222 * (2.45)	PNW	−0.0497 * (2.36)	−0.0498 * (2.37)
FR	0.0179 (1.13)	0.0178 (1.12)	PSW	−0.0659 * (4.99)	−0.0662 * (5.03)
lnA	−0.0014 (0.29)	−0.0012 (0.25)	$\bar{R}^2$	0.2290	0.2291
			N	854	854

* Statistically significant at the 5 percent level.
NOTE: t−statistics are in parentheses under regression coefficients.

The coefficients on dummy variables for individual years are not statistically significant. Coefficients on several regional dummy variables are negative and significant. The excluded region is the West South Central region. The negative coefficients on some of the regional dummy variables indicate that, holding constant other independent variables, loss ratios are significantly lower for banks in several regions than for banks in the West South Central region.

CONCLUSIONS

The main reason for legislating prompt corrective action (PCA) is to reduce losses to deposit insurance funds. The case for such legislation rests on the following assumptions:

First, depository institutions have an incentive to assume greater risk as their capital ratios decline. Second, the longer an institution operates with a low capital ratio, the greater its opportunity to act on incentives to assume risk. Third, supervisors have been ineffective in limiting the risk assumed by poorly capitalized institutions. Fourth, the insurance fund losses due to the failure of individual institutions reflect, to some extent, the risk assumed by these institutions after they became poorly capitalized. And fifth, the actions mandated for supervisors in the legislation will constrain the risk assumed by poorly capitalized institutions, thereby limiting insurance fund losses if they fail.

This paper considers the likely effects of PCA legislation on BIF losses resulting from the failure of commercial banks. The method involves examining whether the evidence about commercial bank behavior and BIF losses support the assumptions that underlie the case for PCA legislation. The assumptions imply that the longer a bank operates with a low capital ratio before failure, the larger the BIF loss.

The evidence does not support this hypothesis. The evidence, instead, is consistent with the hypothesis that, in recent years, supervisors have been effective in constraining the risk assumed by poorly capitalized banks. These results raise doubts about whether PCA legislation will reduce BIF losses.

REFERENCES

Avery, Robert B., Gerald A. Hanweck, and Myron L. Kwast. "An Analysis of Risk-Based Deposit Insurance for Commercial Banks," *Proceedings of a Conference on Bank Structure and Competition,* May 1-3, 1985 (Federal Reserve Bank of Chicago), pp. 217-50.

Barth, James R., Philip F. Bartholomew, and Carol J. Labich. "Moral Hazard and the Thrift Crisis: An Analysis of 1988 Resolutions," *Proceedings of a Conference on Bank Structure and Competition,* May 3-5, 1989 (Federal Reserve Bank of Chicago), pp. 344-84.

Barth, James R., Philip F. Bartholomew, and Michael G. Bradley. "Determinants of Thrift Institution Resolution Costs," *Journal of Finance* (July 1990), pp. 731-54.

Berger, Allen N., Kathleen Kuester King, and James M. O'Brien. "The Limitations of Market Value Accounting and a More Realistic Alternative," *Journal of Banking and Finance* (September 1991), pp. 753-83.

Bernanke, Ben S., and Cara S. Lown. "The Credit Crunch," *Brookings Papers on Economic Activity,* (2:1991), pp. 205-39.

Bovenzi, John F., and Maureen E. Muldoon. "Failure-Resolution Methods and Policy Considerations," *FDIC Banking Review* (Fall 1990), pp. 1-11.

Bovenzi, John F., and Arthur J. Murton. "Resolution Costs of Bank Failures," *FDIC Banking Review* (Fall 1988), pp. 1-13.

Brookings Institution. *Blueprint for Restructuring America's Financial Institutions—Report of a Task Force* (1989).

Brunner, Allan D., John V. Duca, and Mary M. McLaughlin. "Recent Developments Affecting the Profitability and Practices of Commercial Banks," *Federal Reserve Bulletin* (July 1991), pp. 505-27.

Buser, Stephen A., Andrew H. Chen, and Edward J. Kane. "Federal Deposit Insurance, Regulatory Policy, and Optimal Bank Capital," *Journal of Finance* (March 1981), pp. 51-60.

Chirinko, Robert S., and Gene D. Guill. "A Framework for Assessing Credit Risk in Depository Institutions: Toward Regulatory Reform," *Journal of Banking and Finance* (September 1991), pp. 785-804.

Department of the Treasury. *Modernizing the Financial System* (February 1991).

Federal Deposit Insurance Corporation. *The First Fifty Years: A History of the FDIC, 1933-83* (1984).

French, George E. "Early Corrective Action for Troubled Banks," *FDIC Banking Review* (Fall 1991), pp. 1-12.

Garcia, Gillian. "The FSLIC is 'Broke' in More Ways Than One," *Cato Journal* (Winter 1988), pp. 727-41.

Gilbert, R. Alton. "Supervision of Undercapitalized Banks: Is There a Case for Change?" this *Review* (May/June 1991), pp. 16-30.

Horne, David K. "Bank Dividend Patterns," *FDIC Banking Review* (Fall 1991), pp. 13-24.

James, Christopher. "The Losses Realized in Bank Failures," *Journal of Finance* (September 1991), pp. 1223-42.

Keeley, Michael C., and Frederick T. Furlong. "A Reexamination of Mean-Variance Analysis of Bank Capital Regulation," *Journal of Banking and Finance* (March 1990), pp. 69-84.

Keeton, William R. "The New Risk-Based Capital Plan for Commercial Banks," Federal Reserve Bank of Kansas City *Economic Review* (December 1989), pp. 40-60.

Levonian, Mark E. "What Happens if Banks are Closed 'Early'?" *Proceedings of a Conference on Bank Structure and Competition,* May 1-3, 1991 (Federal Reserve Bank of Chicago), pp. 273-321.

Mondschean, Thomas. "Market Value Accounting for Commercial Banks," Federal Reserve Bank of Chicago *Economic Perspectives* (January/February 1992), pp. 16-31.

Peek, Joe, and Eric Rosengren. "The Capital Crunch: Neither a Borrower Nor a Lender Be," *Proceedings of a Conference on Bank Structure and Competition,* May 6-8, 1992a (Federal Reserve Bank of Chicago).

_____. "The Capital Crunch in New England," Federal Reserve Bank of Boston, *New England Economic Review* (May/June 1992b), pp. 21-31.

Shadow Financial Regulatory Committee. "An Outline of a Program for Deposit Insurance and Regulatory Reform," Statement No. 41, February 13, 1989, in George G. Kaufman, ed., *Restructuring the American Financial System* (Kluwer Academic Publishers, 1990), pp. 163-68.

Spong, Kenneth. *Banking Regulation: Its Purposes, Implementation and Effects,* 3rd. ed. (Federal Reserve Bank of Kansas City, 1990).

U.S. General Accounting Office. *Deposit Insurance: A Strategy for Reform* (March 1991).

Walter, John R. "Loan Loss Reserves," Federal Reserve Bank of Richmond *Economic Review* (July/August 1991), pp. 20-30.

Appendix
An Introduction to Bank Accounting and the FDIC's Practices in Resolving Failed Banks

The text assumes a basic understanding of bank accounting principles and the methods used by the FDIC in resolving failed banks. This appendix provides an introduction to these topics.

The accounting principles can be illustrated by referring to the balance sheets of a hypothetical bank. Items in table A1 reflect book rather than market values. For instance, the book value of loans is the sum of the outstanding balances that borrowers owe the bank, other than the loans that have been declared losses. Values of marketable securities are book values, not current market values.

One of the key balance sheet items for our purposes is the allowance for loan and lease losses, which represents an accumulation of past earnings set aside to absorb anticipated future losses on loans that become uncollectable. In accounting statements filed with bank supervisors, the allowance for loan losses is reported on the asset side of the balance sheet as a deduction from loans. Thus, net loans are net of anticipated losses, as reflected in the allowance.

When a bank cannot collect from a borrower, accounting principles indicate that management is to declare the loan a loss and charge the loss against the allowance for loan losses. The accounting entries involve reductions in both loans and the allowance.[1]

Increases in the allowance for loan losses come out of current earnings. The relevant item in the income statement is called the "provision for loan losses," which is included among bank expenses. If a bank must make a large provision for loan losses in a given period, because of actual or anticipated loan losses, current earnings may be negative. When current earnings are negative, equity is reduced.

The top half of table A1 presents the balance sheet of a solvent bank, based on book value accounting. Securities are recorded at their book value of $40. The allowance for loan losses is one-third of nonperforming loans, which the text indicates is about average for the banks in the study up to two years before their failure. The bank could absorb loan losses up to $2 without reducing equity. The ratio of equity to total assets is above 5 percent.

The financial condition of the bank would look worse if securities were marked to their market value of $35. Net worth actually would be zero.

The bottom half of table A1 is the balance sheet of the same bank after it recognizes some loan losses. All $6 of the nonperforming loans turn out to be uncollectable, and an additional $1 of other loans is charged off as a loss. These losses reduce the allowance and equity to zero. At this point, the bank is closed and the FDIC becomes the receiver. The duties of a receiver of a bankrupt firm are to dispose of its assets and make payments to its creditors from the proceeds.

The FDIC's loss depends on the method used to resolve this case. Under the *liquidation* method, the FDIC would pay the fully insured depositors $70 and liquidate the assets, sharing the proceeds of the assets with the uninsured depositors.[2] Equation A1 indicates the determinants of the loss to BIF under the liquidation method.

(A1) BIF loss = $70 (payment to fully insured depositors)
− (70/(70 + 19)) [$5 (cash)
+ $35 (market value of securities)
+ $33 (liquidation value of loans)]
= $12.58.

The present value of payments to the uninsured depositors, on deposits of $19, would be

(A2) (19/89)[$73] = $15.58.

Another method of resolving failed banks is called *purchase and assumption*. The FDIC solicits bids from other banks to purchase some of the assets of the failed bank and to assume its liabilities. In this illustration, the bank with the winning bid purchases the $5 of cash and pays $35 for the securities. Whether this bid would result in a lower loss to BIF than under

[1] See Walter (1991) for a thorough discussion of the allowance for loan losses.

[2] When the FDIC liquidates a bank, it becomes a creditor of the failed bank for the amount of its payment to the insured depositors. The claim of the FDIC against the assets of the failed bank has equal priority to the claims of the uninsured depositors.

Table A1
Balance Sheet of a Hypothetical Bank

PRIOR TO CHARGE-OFF OF LOAN LOSSES

Assets			Liabilities	
Cash		$ 5	Insured deposits	$70
Securities		40	Uninsured deposits	19
Loans				
Nonperforming	6			
Other	45			
Allowance for loan losses	2	49	Net worth	5
		$94		$94

Memo: Market value of securities is $35

AFTER CHARGE-OFF OF LOAN LOSSES

Assets			Liabilities	
Cash		$ 5	Insured deposits	$70
Securities		40	Uninsured deposits	19
Loans				
Nonperforming	0			
Other	44			
Allowance	0	44	Net worth	0
		$89		$89

Memo: Market value of securities is $35.

The present value of loans in liquidation, net of liquidation costs, is $33.

liquidation depends on the size of the premium paid by the winning bidder, as indicated in the followed equation:

(A3) BIF loss = $49 (payment by the FDIC to cover the gap between $40 of assets purchased and $89 of liabilities assumed
− $33 (liquidation value of loans)
− premium.

The premium would have to exceed $3.42 to make the purchase and assumption transaction less costly to the FDIC than liquidation.

A third resolution method is called *transfer of insured deposits*. The FDIC solicits bids from other banks to assume the insured deposit liabilities of the failed bank, but the FDIC liquidates the assets. The FDIC shares with the uninsured depositors the premium paid by the bank that assumes the insured deposit liabilities of the failed bank. Equation A4 presents the loss to BIF:

(A4) BIF loss = $70 (cash to the bank that assumes the insured deposit liabilities)
− (70/89) [$73 (liquidation value of assets) + premium].

A comparison of equations A1 and A4 indicates that the BIF loss is smaller under the transfer of insured deposits than under liquidation for any positive premium.