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Implications of Annual Examinations for the Bank Insurance Fund

THE FEDERAL DEPOSIT Insurance Improvement Act of 1991 (FDICIA) requires many changes in bank supervision and regulation, including a requirement that the federal supervisory agencies conduct on-site examinations of all insured depository institutions at least once every 12 months.[1] Examinations of small (assets less than $100 million), well-capitalized banks are required only every 18 months. This legislation reduces the discretion that federal bank supervisors once had in scheduling bank examinations.[2]

Annual examinations are designed to reduce federal deposit insurance fund losses. More frequent examinations may reveal depository institution problems that can be corrected before they become more serious. In addition, more frequent examinations may permit supervisors to close seriously troubled institutions before their managers make new business decisions that increase the exposure of federal deposit insurance funds to losses. For example, institutions whose troubles have not been detected by their supervisors could increase exposure of the deposit insurance funds to losses by paying dividends or by increasing their assets in desperate gambles to regain solvency through favorable outcomes on new, risky investments.

This paper investigates whether there is a relationship between the frequency of bank examinations and losses to the Bank Insurance Fund (BIF).[3] Logically, such an association should be based on several links between the information gained during individual examinations, actions taken by supervisors on the basis of the information, and BIF losses associated with the failures of individual banks. First, supervisors must be able to identify the serious troubles of failing banks before they fail. Second, examinations of failing banks must help su-

[1]Examination by state authorities may satisfy this requirement every other 12-month period, at the discretion of the federal agencies. The Conference of State Bank Supervisors recently agreed to general principles for the sharing of examination duties with the Federal Deposit Insurance Corporation (FDIC) and the Federal Reserve, the federal agencies that examine state-chartered banks.

[2]For information on the practices of the federal bank supervisors in scheduling examinations, see Flannery and Guttentag (1980).

[3]The FDIC insures the deposits of banks and savings and loans associations but maintains BIF as a separate fund for banks. Banks pay insurance premiums into BIF, which then covers any losses when a bank fails. The importance of examinations in helping supervisors identify problems that can be corrected without failure is beyond the scope of this paper because it deals only with banks that failed.

pervisors identify problems that had not been revealed in prior reports. Third, supervisors must be effective in changing the behavior of banks whose problems they identify through examinations. This paper investigates whether banks reduce their asset growth and dividends after supervisors classify them as problem banks.[4] If so, BIF losses as a percentage of total assets at failed banks that were examined frequently should be less than BIF losses as a percentage of total assets at failed banks that were examined infrequently. The paper presents evidence on these issues.

Because this paper uses observations for banks that failed before passage of FDICIA, it is limited to investigating the importance of examinations in helping supervisors limit BIF losses in the past. As such, extrapolations of the results into the future must be made with caution. Examinations may be more important for limiting BIF losses under FDICIA than in the past, for the following reasons: First, examination improvement programs required by FDICIA may make supervisors more effective in detecting problems in the future through examinations. Second, because FDICIA *requires* supervisors to take prompt corrective action if the capital ratios of banks fall to relatively low levels, supervisors may now be more effective in limiting the risk assumed by problem banks.[5]

THE ROLE OF EXAMINATIONS IN BANK SUPERVISION

Bank supervision involves the oversight of banking organizations by government agencies to ensure that their activities conform to regulations and that they operate in a safe and sound manner. The major purpose of bank supervision is to prevent losses from bank failures. BIF is likely to incur losses in a bank failure, and uninsured depositors will have losses unless a failed bank is merged with a surviving bank. In addition, failure of a bank may deprive its community of banking services. To minimize these losses, supervisors attempt to identify banks with moderate problems in time to indicate changes they consider necessary to prevent greater problems. In addition, supervisors attempt to identify insolvent banks so that they can be closed in a timely manner to prevent additional losses to uninsured depositors and to BIF.[6]

Federal banking supervisors have two main sources of information on the condition of banks: reports and examinations. Supervisors require insured banks to file the quarterly Reports of Condition and Income (Call Report), which includes a balance sheet (report of condition) and an income statement (report of income). The Call Report forms are changed when banking supervisors determine that additional information would help them monitor the condition of banks or fulfill their other supervisory obligations.

The major limitation of the Call Report for monitoring the condition of banks is that some of the most important information can be verified only through on-site examinations by supervisory officials. For example, information on the quality of loans is very important because loan losses are a major cause of bank failures. Although banks are required to disclose some information on the quality of their loans in the Call Report—those that are 30 days or more past due and nonaccrual loans—supervisors reading these reports at a distance cannot vouch for their accuracy.[7] Moreover, because there are no markets for most of the assets in loan portfolios, supervisors must verify the information provided on loan quality and the adequacy of allowances for loan losses to cover expected

[4]The paper focuses on the dividends and asset growth of problem banks because under FDICIA, undercapitalized banks must constrain their asset growth and dividends and disclose their plans to supervisors for raising their capital ratios. One way to raise a bank's capital ratio is to reduce its assets. By enacting FDICIA, Congress indicated its view that such constraints on undercapitalized banks are important for limiting the exposure of BIF to losses.

[5]For a description of the scheme for prompt corrective action mandated in FDICIA and analysis of its likely effects on the risk assumed by troubled banks, see Gilbert (1991, 1992).

[6]See chapter 10 in Benston et al. (1986) for additional discussion of supervision and examination.

[7]The term *nonaccrual* refers to the treatment of interest due from borrowers in bank income statements. If a borrower is past due on loan payments, the bank continues to accrue the interest due on the loan as income until the bank classifies the loan as nonaccrual.

Table 1

Condition of Banks with Different Composite CAMEL Ratings and Supervisory Response

Composite CAMEL rating	Description and Supervisory Response
1	Strong performance with no significant areas of weakness.
2	Fundamentally sound but may have some areas of weakness; these weaknesses, however, would be considered correctable in the normal course of business.
3	Weaknesses of more significant nature that might leave the bank vulnerable to external shocks. Banks with a rating of 3 are considered to require some corrective action and somewhat closer regulatory supervision than institutions that are rated higher.
4	Weaknesses in the bank's condition that, if left unaddressed, could deteriorate to the point of threatening the bank's viability. Banks with a rating of 4 are closely monitored by their regulatory agency and are expected to take action to remedy their shortcomings.
5	Banks that require urgent aid to avert failure. Such banks receive close supervision and financial surveillance.

Source: Hirschhorn (1987), p. 7.

future losses by examining the information on individual loans.[8]

A major focus of on-site bank examinations is the quality of a bank's loan portfolio. On-site visits also permit examiners to review management procedures and make their evaluation of the competence of bank management. Supervisors consider management evaluation an important part of each examination because deficient management practices are often a major cause of bank failures.[9] After an examination, supervisors rate the quality of each of five aspects of bank operation from 1 to 5: capital, asset quality, management, earnings and liquidity (CAMEL), with 1 being the best and 5 the worst. Supervisors also assign a composite CAMEL rating from 1 to 5 to the bank, reflecting their weighting of the ratings assigned to each of the five aspects of bank operation. Table 1 presents an interpretation of composite CAMEL ratings.

Examination findings may be the basis for supervisory action. Examiners report their findings to a bank's senior officers and board of directors, but examination reports are not made available to the public. If banking supervisors indicate that loan quality is significantly worse than was indicated in past Call Reports, a bank will likely file a revised report or adjust subsequent reports to reflect examiners' evaluations. Alternately, examination reports may focus on deficiencies in management practices. If an examination reveals unsatisfactory conditions, supervisors have a variety of powers, such as legally enforceable orders to cease specific

[8]The *allowance for loan and lease losses* entry in the Call Report represents an accumulation of past earnings set aside to absorb anticipated future losses on loans that become uncollectable. When a bank cannot collect from a borrower, accounting principles call for management to declare the loan a loss and charge it against the allowance for loan losses. Increases in the allowance for loan losses come out of current earnings. The relevant item in the report of income is the *provision for loan losses*, which is included among bank expenses. If a bank makes a large provision for loan losses in a given period, current earnings may be negative, thus reducing equity. See Walter (1991) for a thorough discussion of the allowance for loan losses.

[9]See Graham and Horner (1988).

Table 2
Characteristics of Failed Banks in the Study

	Number of banks	Percentage
Year of failure		
1985	100	12.3
1986	121	14.8
1987	165	20.2
1988	143	17.6
1989	146	17.9
1990	140	17.2
Total	815	100.0
Asset size on failure date (millions of dollars)		
Assets < 25	479	58.8
25 ≤ Assets < 50	200	24.5
50 ≤ Assets < 100	89	10.9
100 ≤ Assets	47	5.8
		100.0
Region		
New England (NE)	5	0.6
Middle Atlantic (MA)	9	1.1
South Atlantic (SA)	17	2.1
East South Central (ESC)	17	2.1
West South Central (WSC)	464	56.9
East North Central (ENC)	16	2.0
West North Central (WNC)	169	20.7
Pacific Northwest (PNW)	27	3.3
Pacific Southwest (PSW)	91	11.2
		100.0
Federal supervisor		
OCC	307	37.7
Federal Reserve	49	6.0
FDIC	459	56.3
		100.0

continued

practices or to remove officers from bank operations, to force bankers to change their practices. In each case, supervisors try to prevent the failure of a bank or, if the bank ultimately fails, to limit the size of the loss to BIF and uninsured depositors.

BANKS IN THE STUDY

This study investigates the effectiveness of supervisory examinations in identifying the problems of 815 banks that failed between 1985 and 1990 and the effectiveness of supervisors in constraining the subsequent asset growth and dividend payments of these problem banks. Some of the banks that failed in those years are excluded from the study because of missing data and problems in relating BIF losses to their characteristics before failure.[10]

Table 2 indicates that most of the banks in the study were relatively small: 59 percent had total assets less than $25 million when they failed, and about 94 percent had total assets less than $100 million. Of the failed banks in bank holding companies, only two were in organizations with total banking assets over $1 billion,

[10]A few of the banks that failed in the years 1985–90 are excluded because of missing data on the Call Report. Sixteen banks are excluded because they were involved in mergers within two years of their failure dates; mergers distort observations of asset growth. This study excludes data for 88 bank subsidiaries of six bank holding companies in Texas because the BIF losses attributed to some of these banks reflected problems at their affiliates. Of the remaining banks, 39 are excluded because they were in operation less than three years when they failed, thus limiting the periods for measuring the frequency of examinations.

Table 2
Characteristics of Failed Banks in the Study (continued)

	Number of banks	Percentage
Method of resolving failure		
Purchase and assumption	646	79.3
Transfer of insured deposits	108	13.2
Liquidation	61	7.5
		100.0
Frequency of examinations		
Examined within the last 12 months	508	62.3
Examined within the last 18 months	715	87.7
Longest period between examinations		
Less than or equal to two years	518	63.5
More than two years but less than two and one-half years	131	16.1
More than or equal to two and one-half years but less than three years	56	6.9
Three years or longer	110	13.5
		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, Michigan, Ohio 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

and none was in an organization with total assets over $10 billion.

The failed banks were heavily concentrated in certain regions, with about 57 percent in Arkansas, Louisiana, Oklahoma and Texas. Of the 815 failures, 646 (nearly 80 percent) were resolved through purchase and assumption transactions, in which other banks purchased some of the assets of the failed banks and assumed their liabilities. The FDIC resolved another 13 percent of the cases through transfer of 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 and premiums paid by the banks that assumed the insured deposits. Failed banks were liquidated in the remaining 61 cases.

Table 2 reports that about 62 percent of the banks in this study were examined at least once in their last 12 months of operation. Thus a substantial minority of the failed banks were not examined in their last year of operation. About 88 percent of the banks in this study were examined at least once in their last 18 months of operation. Examinations of state-chartered banks include those by state banking authorities, the Federal Reserve and the FDIC.

Supervisors downgraded the CAMEL ratings of some banks to 5 between their last examinations and failure dates. These changes in CAMEL ratings are called interim changes. A supervisor changes a bank's CAMEL rating on an interim basis without an examination on the basis of information that indicates a substantial change in the condition of the bank. Because this paper

focuses on the value of supervisory examinations, interim changes in CAMEL ratings are excluded from the analysis except where noted.

Table 2 also presents the distribution of the longest periods between examinations for all failed banks, using data on examinations back to the late 1970s. Although the longest period between examinations was two years or less at about 64 percent of the banks, 110 banks (about 14 percent) went three years or longer without examinations.

IMPORTANCE OF EXAMINATIONS FOR EFFECTIVE SUPERVISION

If frequent examinations are important for limiting losses to BIF, examinations must provide supervisors with important information about the problems of banks that is not available from other sources. In addition, after identifying problem banks through examinations, supervisors must be effective in preventing actions that would increase BIF losses. This section investigates how effective bank supervisors are in identifying troubled banks through examinations and in constraining the behavior of problem banks. The next section examines the direct relationship between BIF losses and the frequency of examinations.

Effectiveness in Identifying Troubled Banks

Did supervisors identify the serious problems of failed banks through examinations? If examiners have little ability to distinguish between healthy and troubled banks, more frequent examinations are not likely to make supervisors more effective in limiting BIF losses.

Banks with CAMEL ratings of 4 or 5 are called problem banks, indicating a relatively high probability that they will fail in the near future (table 1). Of the 815 banks in this study, 75 (about 9 percent) had CAMEL ratings of 1, 2 or 3 on their last examinations.[11] Thus the information that triggered the closure of these 75 banks did not come from examinations. Although examinations indicated serious problems in more than 90 percent of the banks that eventually failed, there is room for improvement in the detection of problems through examinations.[12] More frequent examinations will probably increase the proportion of failed banks identified as problem banks on their last examinations, even without improvements in the quality of examinations. Only 10 of the 75 banks (13.3 percent) rated CAMEL 1, 2 or 3 on their last examinations were examined within one year of closing, whereas 67.3 percent of the banks rated CAMEL 4 or 5 on their last examinations were examined within one year of closing.[13]

Importance of Examinations in Detecting Problems

That supervisors rated most failed banks as problem banks in examinations before failure does not necessarily indicate that examinations were important in detecting the problems of these banks. For example, problems cited in examination reports may have been revealed in Call Reports before the on-site examinations. This section investigates whether examinations helped supervisors identify problems that had not been revealed in Call Reports.

Table 3 includes data for 473 banks that had their CAMEL ratings downgraded to 4 or 5 and remained in operation at least one year after the rating changes. *Changes* in equity/total assets ratios of these banks—a measure of solvency from the Call Report—were negative on average and significantly different from zero in each of the three quarters just before the examinations that resulted in ratings reductions (critical examinations). Before these examinations, therefore, changes in the equity/total assets ratios of these banks indicated the deterioration of their

[11]Of these 75 banks, 31 were rated CAMEL 1 or 2 on their last examinations. French (1991) concludes that a CAMEL rating of 3 shortly before failure, instead of a 4 or 5, indicates that the examination process did not detect the severity of the problems. See French for another investigation of the effectiveness of examiners in detecting problems of banks before their failure. Also see Benston (1973) and Bovenzi, Marino and McFadden (1983) for analysis of CAMEL ratings before bank failure.

[12]An analysis by Bowsher (1990), p. 16, of the General Accounting Office, found a similar percentage of banks identified as problem banks before their failure. Bowsher presents the following analysis: "Because a bank's financial condition does not deteriorate overnight, the regulatory supervision process should detect an emerging problem bank before its imminent failure. Of the 406 banks that failed in the last two years, however, we found that 22 failed without ever appearing on the problem bank list and that nine failed after appearing on the list for only one quarter."

[13]The difference in these proportions (0.673 vs. 0.133) is statistically significant at the 5 percent level (t-statistic = 12.61).

Table 3

Changes in Bank Balance Sheets around the Time of Examinations in which CAMEL Ratings Were Downgraded to 4 or 5

Period	Changes in equity/total assets ratio			Changes in ratio of nonperforming loans to total assets		
	Mean	Standard deviation	t-statistic	Mean	Standard deviation	t-statistic
Three quarters before examination	−0.00428	0.01583	5.89*	0.00423	0.01567	5.88*
Two quarters before examination	−0.00419	0.01663	5.48*	0.00468	0.01656	6.15*
One quarter before examination	−0.00728	0.01624	9.75*	0.00673	0.01921	7.62*
Quarter of examination	−0.01308	0.01867	15.24*	0.00416	0.02044	4.43*
One quarter after examination	−0.00444	0.01334	7.24*	0.00931	0.02339	8.66*
Two quarters after examination	−0.00466	0.01315	7.71*	0.00885	0.02522	7.63*
Three quarters after examination	−0.00858	0.01694	11.02*	0.00562	0.02423	5.04*
Changes in Assets and Dividends						
Change in growth rate of total assets[1]				20.49%		11.04*
Change in dividend ratio[2]				*0.00292*		*8.57**

[1]Percentage change in total assets in the four quarters ending in the quarter of the examination minus the percentage change in total assets in the following four quarters.

[2]For each of the 233 banks that paid dividends in at least one of the four quarters just before the examinations, the sum of dividends paid in those quarters, minus the sum of dividends in the following four quarters, divided by total assets in the quarter of the examination.

*Mean significantly different from zero at the 5 percent level.

NOTE: The sample includes 473 banks that failed in the years 1985-90. These banks had examinations during the three years ending in their failure in which their CAMEL ratings were downgraded to 4 or 5 (from 1, 2 or 3). Balance sheet data are available for each of these banks for four quarters before the quarter of the examinations in which their CAMEL ratings were downgraded to 4 or 5 and for four quarters following those examinations.

conditions. The mean decline of 1.31 percentage points in equity/total assets ratios in the quarters of the critical examinations, however, is significantly different from the means of the percentage changes in quarters before or after the critical examinations. The relatively large declines in equity/total assets ratios in critical examination quarters indicate that the banks in this study made relatively large provisions in those quarters to cover current or anticipated loan losses.[14] The observations in table 3 are consistent with the view that examiners identified problems that had not been reflected in these banks' balance sheets before the critical examinations.

A rise in nonperforming loans (NPLs) in Call Reports at the time of critical examinations is

[14]The relatively large declines in equity/total assets ratios in the quarters before the examinations also may reflect the timing of the examinations. If examiners finish their work early in a quarter, the bank may not have filed its Call Report for the prior quarter. In some cases supervisors require banks to refile their most recent Call Reports after examinations. The declines in equity/total assets ratios in the quarters before the examinations may reflect problem loans or loan losses identified by the examiners.

When supervisors first give a bank a CAMEL rating of 4 or 5, they often examine the bank again within a few quarters. The relatively large average decline in equity/total assets ratios three quarters after the banks were first rated CAMEL 4 or 5 may reflect the effects of these follow-up examinations. Of the 473 banks included in the calculations of table 3, 97 were examined three quarters after the examinations that resulted in ratings reductions to CAMEL 4 or 5.

another indicator that examinations help supervisors discover problems not disclosed in prior Call Reports. In table 3 the means of the changes in the NPL/total assets ratios were positive and significantly different from zero in the quarters just before the examinations. The mean change in NPL/total assets ratios, however, was larger in each of the first two quarters after the critical examinations than in the quarters before the examinations.[15] The relatively small increases in NPL/total asset ratios in the critical examination quarters reflect some NPLs charged off as losses in those quarters.[16] These comparisons are consistent with greater accuracy in the reporting of nonperforming loans after banks are examined and their CAMEL ratings are downgraded to 4 or 5.[17]

Finally, the timing of reductions in ratios of equity to total assets to relatively low levels indicates the importance of examinations for accurate data on bank capital ratios. Most banks in this study reported balance sheets with relatively low capital ratios only after examinations in which their CAMEL ratings were downgraded to 4 or 5. Based on data for the three years before failure dates, only 76 of the 815 failed banks (9.3 percent) had their ratios of equity to total assets fall below 5 percent more than one quarter before these critical examinations. In contrast, 133 of the 815 banks had their equity/total assets ratios fall below 5 percent in the quarters of the critical examinations, and an additional 62 banks had their equity/total assets ratios fall below 5 percent in the quarters before these examinations, for a total of 195 banks (23.9 percent). In some cases the effects of examinations on equity/total assets ratios are recorded just before the quarters in which the banks were examined.[18] The timing of declines in equity/total assets ratios to relatively low levels is consistent with the view that examinations revealed information about problems that banks had not disclosed in their Call Reports.

Effectiveness in Constraining the Behavior of Problem Banks

Examinations are important for limiting BIF losses if they disclose the problems of banks with relatively high chances of failure and if bank supervisors are effective in constraining behaviors at problem banks that would tend to increase the exposure of BIF to losses. This section investigates whether banks tend to reduce their asset growth and dividends after critical examinations.

Why look at asset growth and dividends? This paper does not attempt to prove that constraints on asset growth and dividend payments at problem banks limit BIF losses. Instead, these constraints are taken from FDICIA, which requires supervisors to constrain the asset growth and dividends of undercapitalized banks. This section examines whether supervisors were effective before passage of FDICIA in imposing on problem banks the types of constraints that they are required to impose on undercapitalized banks under FDICIA.

Changes in asset growth and dividends after examinations. Table 3 indicates that banks tend to reduce the growth rates of their assets and reduce dividends after supervisors downgrade their CAMEL ratings to 4 or 5. The mean of the growth rate of total assets of the banks discussed in table 3 in the year ending in the quarter of the critical examination minus the growth rate of total assets in the following year is about 20 percentage points, which is significantly different from zero.

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[15]Bowsher (1990), pp. 15–16, reports that the staff of the General Accounting Office found evidence of this association between the timing of examinations and disclosure of NPLs. "Although we did not review the overall quality of Call Reports, we found examples in reviewing certain problem banks that suggest Call Report accuracy often depends on whether there has been a recent examination by the bank regulators. Generally, we found that the regulators reported that these institutions had understated the level of nonperforming loans in their Call Report submissions and thus had established inadequate levels of loss reserves and had overstated interest income and net income."

[16]Banks that had their CAMEL ratings downgraded from 1 or 2 to 3 had significant declines in equity/total assets ratios and significant increases in NPL/total assets ratios in quarters just before critical examinations but not in critical examination quarters. These observations are consistent with the view that downgrades of CAMEL ratings to 3 indicate that examiners recognized the deterioration in the condition of the banks after problems had already been revealed in Call Reports, not that examiners discovered previously unreported problems through examinations.

[17]Critics of bank examinations maintain that supervisors could monitor the condition of banks more efficiently by monitoring reports and examining banks less frequently. See Benston (1973), pp. 64–69, and Benston et al (1986), pp. 245–71. Results in table 3 indicate that examinations are important for ensuring the accuracy of data on bank balance sheets and income statements. With less frequent examinations, Call Reports would provide less accurate information on the condition of banks. It is not appropriate therefore to use past banking data to draw conclusions about how efficiently supervisors could use reports to monitor the condition of banks if supervisors examined banks less frequently.

[18]See footnote 14.

Effects of changes in CAMEL ratings on dividends are investigated for 233 banks (of the 473) that paid dividends in at least one of the four quarters before their critical examinations. The mean of the differences in the dividend ratios before and after critical examinations is positive and significantly different from zero. The mean change in the dividend ratio implies that a bank with total assets of $50 million as of the examination date would reduce its dividends by $146,000 in the four quarters after the critical examination, relative to dividends paid in the previous four quarters.[19]

How large are dividend payments by problem banks? Another way to look at the effectiveness of supervisors in constraining dividend payments by undercapitalized or problem banks is to estimate how much their dividend payments added to BIF losses when they failed. Because dividend payments reduce the capital cushion available to absorb losses, each dollar of dividends paid by an undercapitalized or problem bank may be assumed to increase BIF losses by a dollar when the bank fails.[20] BIF losses caused by dividend payments by undercapitalized and problem banks are estimated for the 815 banks in this study. Using data for the last three years of each bank's operations, dividend payments made by banks in quarters in which their equity/total assets ratios were below 4 percent or their CAMEL ratings were 4 or 5 are summed over all 815 banks. The 4 percent cutoff for the equity/total assets ratio is based on the provision in FDICIA that forbids dividend payments that would make a bank undercapitalized. The supervisory definition of undercapitalized includes a ratio of tier 1 capital (essentially the same as equity) to total assets below 4 percent. The sum of dividends paid by the 815 banks while undercapitalized or rated CAMEL 4 or 5 is 0.8 percent of BIF losses incurred in resolving the failures of the 815 banks. Thus although supervisors have allowed some banks to pay dividends while their capital ratios were low or they were classified as problem banks, eliminating dividend payments in such circumstances would have produced a relatively small reduction in BIF losses.

More on the effects of CAMEL ratings on asset growth. One limitation of the analysis in table 3 of how changes in CAMEL ratings affect asset growth is that the failed banks as a group tend to reduce the growth rates of their assets as they approach failure, as shown in panel A of figure 1. The change in asset growth reported in table 3 therefore represents a mixture of effects: banks getting closer to failure and banks subject to changes in the degree of pressure from their supervisors to raise capital ratios.

Panel B of figure 1 separates these effects on asset growth by comparing the mean growth rates of assets at banks with different CAMEL ratings from 10 quarters up to one quarter before their failures. For each lag, the mean growth rate of assets is significantly lower for banks rated CAMEL 4 or 5 than for those rated CAMEL 1 or 2. Figure 1 therefore indicates that after adjusting for the time to failure, growth rates of assets are lower for the banks rated CAMEL 4 and 5.[21] These results are consistent with the view that supervisors were effective in constraining the asset growth of banks they identified as problem banks.

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[19]See Spong (1990), pp. 64–71, for a description of the policies of federal bank supervisors regarding dividend payments by banks before FDICIA. Banks that had their CAMEL ratings downgraded to 3 did not have significant declines in the growth rates of total assets in the four quarters following their examinations. Those that paid dividends in the four quarters before the examinations, however, had significant reductions in dividends in the four quarters following the downgrades in their CAMEL ratings to 3.

[20]In some cases undercapitalized or problem banks received capital injections from shareholders around the time they paid dividends. The dividend payments may have been important for maintaining the confidence of shareholders in the viability of these banks. In these cases the assumption of a one-to-one relationship between dividends and BIF losses may overstate the effects of dividends.

[21]Numbers above and below the bars in panel B of figure 1 are the numbers of banks used in calculating the mean growth rates of total assets. Panel B in figure 1 reflects interim changes in CAMEL ratings, as well as CAMEL ratings established through examinations. Banks are excluded from the calculations of mean growth rates of assets in those quarters in which their CAMEL ratings were changed. Suppose, for instance, a bank had its CAMEL rating downgraded from 3 to 5 four quarters before its failure. The growth rate of that bank would not be included among the growth rates of CAMEL 4 and 5 banks four quarters before their failures, but the growth rate of that bank would be included among the CAMEL 4 and 5 banks three, two and one quarters before failure. This exclusion eliminates any initial effect of a change of CAMEL rating on asset growth, indicating instead the continuing effects of differences in CAMEL ratings on asset growth after the initial changes.

Figure 1a

Average Growth Rates of Total Assets (All 815 Banks)

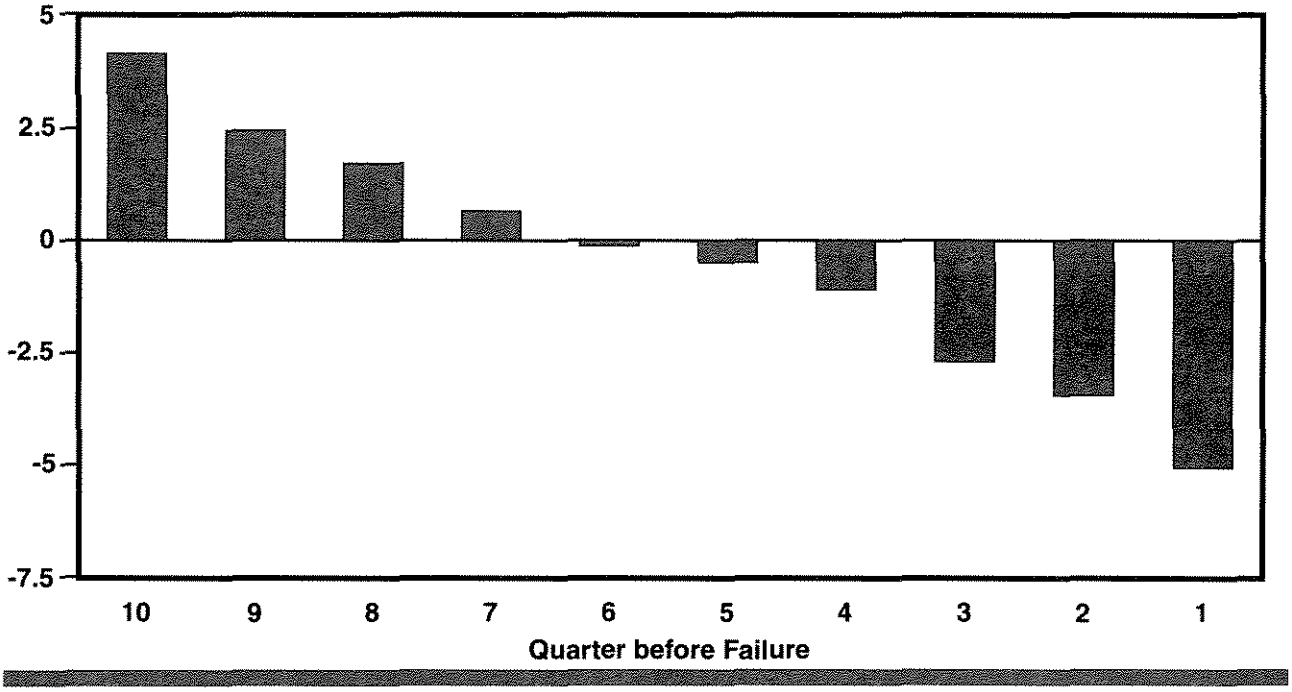

Figure 1b

Average Growth Rates of Total Assets for Banks with Different CAMEL Ratings

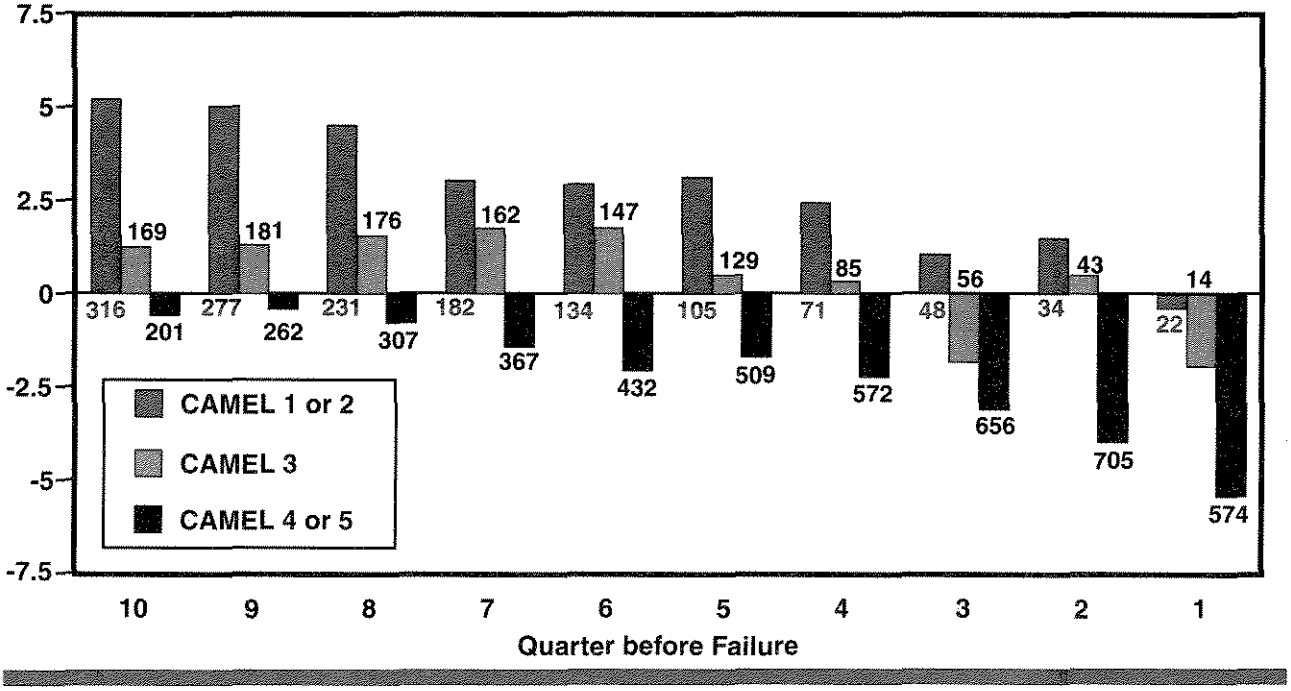

Table 4

Association Between Frequency of Examination and BIF Loss/Total Assets Ratios

Time since last examination	No. of banks	BIF loss/total assets ratios: Mean	BIF loss/total assets ratios: Standard deviation
Examined at least once in last 12 months	508	0.2523	0.1222
Not examined in last 12 months	307	0.2915	0.1344
Not examined in last 18 months	100	0.2922	0.1143
Longest period between examinations			
Less than or equal to two years	518	0.2649	0.1284
More than two years	297	0.2709	0.1281
More than two years but less than two and one-half years	131	0.2833	0.1286
Less than three years but more than or equal to two and one-half years	56	0.2773	0.1348
Three years or longer	110	0.2550	0.1235

FREQUENCY OF EXAMINATIONS AND BIF LOSSES

Data presented in the preceding sections suggest a relationship between BIF losses and the frequency of examination before bank failure. The evidence indicates that examinations helped supervisors identify problem banks that ultimately failed. Moreover, supervisors appear to have constrained the asset growth and dividend payments of banks identified as problem banks through examinations. Together, these results suggest that more frequent examinations should result in lower BIF losses.

It is possible, however, to develop another hypothesis that implies the opposite sign on the relationship between the frequency of examinations and BIF loss/total assets ratios. Suppose supervisors examine more frequently the banks they consider to have more severe problems and allow banks they consider relatively sound to operate for longer periods between examinations. If supervisors schedule examinations according to their estimates of the financial strength of banks and if those estimates are accurate, the banks with relatively high BIF loss/total assets ratios when they fail would be among those examined most frequently.[22] The nature of the relationship between the frequency of examinations and BIF loss/total assets ratios therefore must be settled by examining the data.

Examinations Near Time of Failure

Table 4 compares average BIF loss/total assets ratios at banks examined at least once in their last 12 months of operation with those of failed banks not examined during their last year of

[22]An attempt to identify empirically the determinants of the timing of examinations yielded insignificant results. The dependent variable in a probit regression equation was a dummy variable with a value of unity if a bank was examined in a given quarter, zero otherwise. Independent variables included CAMEL ratings on prior examinations, time since the prior examinations, capital ratios and measures of asset quality for several quarters just before the current quarter, the bank's federal supervisory agency, year of the examination and region. Only a few of the independent variables were significant, and the overall equation had insignificant explanatory power. These results do not support the hypothesis that the timing of examinations varies systematically with information available to supervisors on the condition of banks before examinations.

operation. The average BIF loss/total assets ratio is almost 4 percentage points higher for the banks not examined in their last year of operation, and the difference in these mean BIF loss/total assets ratios is statistically significant (t-statistic = 4.17). The difference is also economically significant. For a bank with total assets of $50 million as of its failure date, this difference would increase the BIF loss by $1.96 million.[23]

This comparison of BIF loss/total assets ratios based on frequency of examination does not necessarily indicate that 12 months is a critical frequency for examinations. Perhaps BIF loss/total assets ratios are higher only for the banks not examined for longer periods before failure, such as their last 18 to 24 months of operation. To explore such a possibility, table 4 also presents the average BIF loss/total assets ratio for banks not examined in their last 18 months, which is about the same as the average BIF loss/total assets ratio for those banks not examined in their last 12 months. Lack of information from examinations in the last 12 months of operations at failed banks appears to hinder the effectiveness of supervisors in limiting BIF losses.

Longest Period Between Examinations

Comparisons in the top half of table 4 may not capture all of the relevant information about the effects of infrequent examinations on BIF loss/total assets ratios. Some banks that went several years between examinations were examined frequently just before being closed. In these cases, the problems that led to failure and relatively large BIF loss/total assets ratios may have gone undetected for several years because of infrequent examinations until near the time of failure.

To capture this additional aspect of examination frequency, the longest period between examinations is identified for each bank. Data on the dates of examinations are available back to the late 1970s. Table 4 presents the distribution of the 815 banks by their longest period between examinations. The mean BIF loss/total assets ratio for each group of banks is *not* significantly different from the mean for each of the other groups. BIF loss/total assets ratios are therefore not related to the length of time between examinations. These observations, however, should not be interpreted as evidence against the requirement of annual examinations. Without regular examinations, supervisors cannot determine which banks should be classified as problem banks and therefore subject to closer supervision.

Table 5
Variation in the Percentage of Banks Subject to Examinations in their Last Year

Region	Percentage of failed banks examined in their last year
New England	80.0
Middle Atlantic	55.6
South Atlantic	64.7
East South Central	52.9
West South Central	53.2
East North Central	75.0
West North Central	79.3
Pacific Northwest	81.5
Pacific Southwest	70.3
Federal bank supervisory agency	
OCC	45.3
Federal Reserve	81.6
FDIC	71.7

REGRESSION ANALYSIS

Table 5 indicates that the proportions of failed banks subject to examinations in their last year vary by region and by federal supervisory agency. For instance, only 45.3 percent of national banks [supervised by the Office of the Comptroller of the Currency (OCC)] were examined in their last year. In Texas only one-third of the national banks were examined in their last year.[24]

[23]The staff of the House Banking Committee (U.S. Congress, 1991) concludes that annual examinations are important for reducing BIF losses. Their conclusion is based on the following observation. The supervisory agencies that subject higher percentages of the banks under their jurisdiction to annual examinations have lower ratios of BIF losses by failed banks to the total assets of all banks under their jurisdiction.

[24]The staff of the House Banking Committee (U.S. Congress, 1991) reports disparities similar to those in table 5 among the federal bank supervisory agencies in the percentages of banks subject to annual examinations.

The association between BIF loss/total assets ratios and examinations in the last years of operations presented in table 4 may actually reflect regional influences, practices of federal supervisors or the effects of other variables that are correlated with proportions of banks examined in their last year. Using multiple regression analysis, this study estimates the association between examinations and BIF loss/total assets ratios, holding constant the influences of other determinants of BIF loss/total assets ratios that may be correlated with the frequency of examinations.

In the regression analysis, the dependent variable is the loss to BIF divided by total assets as of the failure date. The equation is estimated with observations for bank failure cases resolved through purchase and assumption (P&A). In a P&A case, a solvent bank purchases some of the assets of a failed bank and assumes its liabilities. Banks that assume the liabilities of failed banks in P&A cases purchase some of their assets and receive cash from the FDIC in the amount of the difference between the assets purchased and liabilities assumed. Banks bid for a failed bank in terms of premiums, and the cash payment to the winning bidder is net of the premium.

Of the sample of 815 failed banks, about 80 percent were resolved through P&A. The appropriate regression models would be different for the other cases, which were resolved through transfer of insured deposits or liquidation. In particular, BIF shares its losses with uninsured depositors in the cases resolved through transfer of insured deposits or liquidation. Also, the coefficients on regional dummy variables may vary by resolution method because failed banks are more valuable to potential bidders for P&A if state law permits the winning bidders to reopen the offices of the failed banks as their branches. In states that restrict branching, winning bidders must consolidate the assets and liabilities of the failed banks at their existing offices.

For bank failure cases resolved through P&A, BIF loss can be specified as follows:

BIF loss = Decline in the value of assets below book values
− (New worth + the allowance for loan losses)
(1) − Premium

The net worth of a failed bank plus its allowance for loan losses is a buffer for the FDIC as receiver of a failed bank because declines in the value of bank assets relative to their book values may be charged against net worth and the allowance for loan losses before BIF absorbs any losses. The premium paid by the winning bidder in a P&A case reduces the loss to BIF. In the regression equation, the ratio of BIF losses to total assets is estimated as a function of several independent variables selected to reflect the items in equation (1), which are identified in table 6.

Identification of Independent Variables

Net worth plus allowance for loan losses. Banks with larger net worth and allowance for loan losses at the time of failure tend to have lower BIF losses, as indicated in equation (1). The independent variable included to capture this effect is C—equity plus the allowance for loan losses on the last Call Report, all divided by total assets as of the failure date—which is assumed to have a negative coefficient.

Frequency of examinations. A dummy variable for banks examined in their last 12 months (E12) is included as a measure of the frequency of examinations. The book values of assets at banks examined in their last 12 months of operation are assumed to approximate more closely the values of the assets to the FDIC as receiver than the book values of banks not examined in their last 12 months of operation. Thus the percentage declines in the value of assets relative to book values will tend to be smaller for banks examined in their last 12 months of operation. The coefficient on E12 is therefore assumed to be negative.

Decline in the value of securities relative to book value. In the Call Report, banks value securities at book values in the balance sheet but report the market value of their securities as a separate item. When a bank fails, the decline in the value of securities relative to book values is assumed to be proportional to the gap between the market value and book value of securities on the last Call Report. The following variable is included as a measure of the gap between the market value and book value of securities: MARKET—a variable that equals the book value of securities minus their market value listed on the last Call Report, all divided by total assets as of the failure date.

Table 6
Identification of Independent Variables

C - Equity plus the allowance for loan losses on the last Call Report, all divided by total assets as of failure date

E12 - Dummy variable with a value of unity if a bank was subject to an examination in the 12 months before its failure, zero otherwise

MARKET - Book value of securities in the investment account as of the last Call Report, minus the market value of the securities, all divided by total assets as of failure date

NPL - Loans and leases past due 90 days or more plus nonaccrual loans on the last Call Report, all divided by total assets as of failure date

ACCRUED - Interest on loans that had been accrued as income but not received as of the last Call Report, all divided by total assets as of failure date

OREO - Other real estate owned (other than bank premises) on the last Call Report, all 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

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

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

1985–89 - Dummy variables with values of unity for banks that failed in these years

NOTE: NE, MA, SA, ESC, ENC, WNC, PNW, PSW are dummy variables for the regions in which failed banks were located. See table 2 for identification of the regions.

Decline in the value of loans relative to book value. The gap between the book value of loans before failure and the value of the loans to the FDIC as receiver of a failed bank is assumed to be related to measures of loan quality derived from Call Reports filed before failure. To the extent that the measures of loan quality derived from Call Reports are accurate, the largest declines in the value of loans relative to book values are likely to be among the loans identified before failure as poor-quality loans. The following measures of loan quality are assumed to have positive coefficients.

NPL = Loans and leases 90 days or more past due plus nonaccrual loans, all divided by total assets as of failure date

ACCRUED = Interest on loans that had been accrued as income, but not received as of the last Call Report, divided by total assets as of failure date

OREO = Real estate owned (other than bank premises) according to the last Call Report, divided by total assets as of the failure date

These variables reflect bank accounting practices. When borrowers fall behind on their contracted loan payments to a bank, the bank continues to accrue the interest it is due as current income until the bank classifies the loan as nonaccrual. Thus the variable NPL reflects the book value of both categories of loans. The vari-

able ACCRUED reflects interest accrued but not paid to the bank by its borrowers. The variable OREO, which reflects loan defaults, tends to rise as borrowers default on their loans and banks take possession of real estate their borrowers had pledged as collateral. In the Call Report, foreclosed real estate is valued at the lower of the unpaid balances of loans on which borrowers defaulted or the fair market value of the real estate.

Composition of deposits as a determinant of premiums. The hypothesized sign on the following variable would depend on the method used by the FDIC to resolve a bank failure case.

IDR = Last data available on deposits in accounts up to $100,000 each, divided by total assets as of the failure date.

For cases resolved through liquidation, the hypothesized sign on this variable would be positive. In liquidation cases, the FDIC provides full coverage for insured depositors but shares losses with uninsured depositors. Thus losses to BIF would be higher in those liquidation cases in which the ratio IDR is higher, holding the other determinants of BIF losses constant.

In P&A cases, in contrast, the FDIC does not share losses with uninsured depositors because the winning bidder in a P&A case assumes all of the deposit liabilities of a failed bank. The sign on IDR in P&A cases is hypothesized to be negative because bidders in P&A cases tend to bid higher premiums for banks with higher ratios of fully insured deposits to total assets.[25] Fully insured deposits are valuable to bidders because banks tend to pay relatively low interest rates on fully insured deposits.[26]

Asset growth. Panel B of figure 1 indicates that the banks identified as problem banks had sharper declines in their assets than other banks as they approached failure. These differential rates of asset growth tend to bias the BIF loss/total assets ratios of the banks identified as problem banks upward by reducing the denominators in these ratios. The variable GROWTH is included as an independent variable to adjust for such a bias. GROWTH is the change in a bank's total assets in the 12 months ending with its failure, divided by total assets as of its failure date. GROWTH is expected to have a negative sign because the effect of an increase (decrease) in assets in the last year on the BIF loss/total assets ratio is assumed to be primarily an increase (decrease) in the denominator of this ratio.

Dividends. The coefficient on DIV—dividends in the last year divided by total assets as of the failure date—may be positive for two reasons. First, dividends are payments of capital to shareholders that leave less capital to absorb reductions in asset value. Second, dividends may signal that shareholders saw little reason to attempt to prevent failure. Indeed, they may have paid out capital in anticipation of failure.

Federal supervisory agency. The primary supervisor of nationally chartered banks is the OCC. The Federal Reserve supervises state-chartered banks that are members of the Federal Reserve System, whereas the FDIC supervises the remaining state-chartered banks. Differences in supervisory practices among these agencies may affect BIF losses in ways not accounted for by the other independent variables. Dummy variables (OCC and FR) are included to capture such effects.

Bank size. James (1991) found that FDIC administrative costs were higher per dollar of assets for small failed banks. BIF loss/total assets ratios therefore may be higher for small banks. The bank size variable is the natural log of total assets as of failure date.

Location and year of failure. Dummy variables for the regions of failed banks and the years in which they failed are included as the remaining independent variables. BIF loss/total assets ratios may vary systematically by region and year of failure. Table 2 identifies the abbreviations for regions.

Regression Results

The coefficient on C in table 7, which is negative and statistically significant, is also significantly different from minus one. Equation (1), however, implies a coefficient of negative unity for C. The deviation of the coefficient on C from negative unity probably reflects the fact that observations for equity and the allowance

[25]See James (1991). Berkovec and Liang (1991) found that premiums paid by winning bidders in bank failure cases were positively related to core deposits, measured as transactions deposits and savings deposits.

[26]See Brunner, Duca and McLaughlin (1991).

Table 7
Determinants of Bank Insurance Fund Losses Resulting from Individual Bank Failures

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

Independent variables	Regression number	Independent variables	Regression number
Intercept	0.3383* (5.01)	1985	0.0139 (0.73)
C	−0.4698* (4.31)	1986	0.0185 (1.05)
E12	−0.0195* (2.09)	1987	0.0044 (0.29)
MARKET	−0.3200 (0.53)	1988	0.0206 (1.43)
NPL	0.2714* (3.32)	1989	−0.0039 (0.28)
ACCRUED	4.5707* (7.47)	NE	0.0203 (0.27)
OREO	0.6289* (6.30)	MA	−0.0147 (0.19)
IDR	−0.1051* (3.80)	SA	−0.0362 (1.29)
GROWTH	−0.0396* (2.05)	ESC	−0.0849* (2.85)
DIV	−0.1941 (0.16)	ENC	−0.0380 (1.13)
OCC	0.0093 (0.94)	WNC	−0.0754* (5.58)
FR	0.0099 (0.50)	PNW	−0.0492* (2.05)
lnA	−0.0079 (1.43)	PSW	−0.0379* (2.59)

$\bar{R}^2$ = 0.2456 RMSE = 0.1060 N = 646

*Statistically significant at the 5 percent level.

NOTE: t-statistics in parentheses under regression coefficients

for loan losses used in deriving the variable C were from the last Call Reports, which were filed several months before the failure dates. There were probably substantial chargeoffs of loan losses against the allowance for loan losses and against equity between the dates of the last Call Reports and failure dates.

The coefficient on E12 in table 7 is negative and statistically significant, indicating lower BIF loss/total assets ratios for banks examined in their last 12 months of operation, holding other factors constant. The size of the coefficient on E12, however, implies an effect of examination in the last year on BIF loss/total assets ratios that is about half of the effect in table 4, which does not hold constant other determinants of BIF loss/total assets ratios.

The coefficient on MARKET is not significant. The three measures of loan quality (NPL, ACCRUED and OREO) have positive and statistically significant coefficients.

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 in P&A cases. The coefficient on GROWTH is negative and significant, as hypothesized, whereas the coefficient on DIV is not significant.

The coefficient on OCC is not significant in this equation and is not significant with the variable E12 excluded as an independent variable. Table 5 indicates that a relatively low proportion of national banks were examined in their last year. Correlation between OCC and E12, however, does not account for the insignificance of the coefficient on OCC in the equation reported in table 7. The coefficient on FR indicates no significant effect of Federal Reserve membership on the BIF loss/total assets ratios of state-chartered banks, holding the other independent variables constant.

The coefficient on the natural log of total assets does not support the hypothesis of higher BIF loss/total assets ratios for small failed banks. The coefficients on dummy variables for individual years are not statistically significant. The negative, significant coefficients on some of the regional dummy variables indicate that, holding other independent variables constant, BIF loss/total assets ratios were significantly lower for banks in several regions than for those in the West South Central region, the excluded region.

IS 18 MONTHS TOO LONG BETWEEN EXAMINATIONS?

This paper provides empirical support for the requirements in FDICIA for frequent examinations. This section deals with the implications of the exemption for small, well-capitalized banks, which must be examined only once every 18 months. Given the importance of examinations in identifying problem banks and limiting BIF losses, is 18 months too long between examinations for relatively small, well-capitalized banks?

The answer depends on the objective of supervisors in conducting examinations. The issue of how many failures would be prevented without this exemption is beyond the scope of this paper. A major objective of supervision is to identify the banks with serious problems and to prevent them from taking actions that would increase the exposure of BIF to losses. Given this objective, one way to determine the appropriate length of time between examinations is to determine how many banks failed within 18 months of examinations in which they met the following criteria:

1. Total assets less than $100 million
2. Equity/total assets ratios greater than 6 percent (the level recently set as an indicator of a well-capitalized bank)
3. CAMEL rating of 1 on the examination

FDICIA states that banks that may be examined only once every 18 months must have composite ratings of outstanding on their last examinations.[27]

Of the 815 banks in this study, 124 met these three conditions at least once in the quarters in which they were examined. Only three of the 124 banks failed within 18 months of these examination dates, all in 1987. These observations indicate that few cases of serious problems in banks will go undetected by supervisors because of the 18-month exemption for small, well-capitalized banks.

CONCLUSIONS

FDICIA requires that federal supervisors of insured depository institutions examine each of these institutions annually. Small, well-capitalized institutions need to be examined only once every 18 months. The purpose for this provision in FDICIA is to reduce deposit insurance fund losses.

Evidence in this paper supports the argument that the requirement of annual examinations will reduce losses of BIF. Most of the failed banks in this study were identified through examinations as problem banks before their failure, and examinations helped supervisors identify problems that had not been disclosed in prior Call Reports. In addition, supervisors were effective in slowing asset growth and reducing dividends at banks identified as having serious problems.

Losses to BIF were smaller for banks examined in their last 12 months of operation. If the requirements for prompt corrective action in FDICIA also make supervisors more effective in constraining the behavior of banks classified as problem banks, results in this paper will be underestimates of the contributions of annual examinations to reductions in BIF losses.

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[27]The 18-month exemption is canceled if a bank is sold.

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