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Will Legislated Early Intervention Prevent the Next Banking Crisis?

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Abstract

A key provision of The Federal Deposit Insurance Corporation Improvement Act of 1991 (FDICIA) was prompt corrective action (PCA). PCA emphasized early intervention by bank supervisors and was intended to limit forbearance by making supervisory intervention more timely and less discretionary. However, PCA legislation appears to have been oversold. Had PCA been in place during the recent banking crisis in New England, it would have had little, if any, effect. Relative to actions taken by supervisors, PCA provisions would not have imposed more severe restrictions on banks, intervened earlier, or intervened in problem banks that would otherwise have been missed.

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Will Legislated Early Intervention Prevent the Next Banking Crisis?

In the 1980s, problems in depository institutions stimulated an overhaul of banking legislation unprecedented since the Great Depression. The cornerstone of the new legislation was the Federal Deposit Insurance Corporation Improvement Act of 1991 (FDICIA), which emphasized early intervention by bank regulators. To achieve the act's primary goals of least-cost resolution of insured depository institutions and improved bank supervision, FDICIA has two key provisions, early closure of failing institutions and early intervention, which requires supervisory intervention in undercapitalized banks that becomes progressively more restrictive as a bank's capital declines.

For the early intervention legislation, known as prompt corrective action (PCA), to have major benefits compared to the supervisory intervention framework that existed at the time of PCA legislation, PCA must produce supervisory intervention that either imposes more severe restrictions on banks, intervenes earlier, or intervenes in problem banks that would otherwise be missed. The pre-existing form of supervisory intervention we examine is the imposition of formal regulatory actions (cease and desist orders and written agreements), the most severe supervisory action short of closing the bank. Formal actions are legally binding contracts between bank supervisors and bank management that detail changes required of the bank, with civil penalties attached if the agreement is not carried out.

Considering the period immediately preceding the implementation of PCA legislation, we find that formal regulatory actions tend to occur well before most banks become undercapitalized according to PCA capital thresholds, and they include restrictions on bank behavior that tend to

be more comprehensive than those in the PCA provisions. Furthermore, to the extent that PCA-based intervention would have occurred earlier or in a bank that failed to receive a formal action, the intervention is related more to the relative infrequency of bank examinations than to PCA eliminating supervisory forbearance. In fact, any improvement in supervisory intervention is more likely to come from the FDICIA requirements for more frequent examinations than from the PCA legislation.

These results indicate that PCA has been substantially oversold.[1] Because it imposed an essentially nonbinding constraint on supervisory intervention, PCA would have had little effect on the timing of intervention in the most recent instance of significant banking problems in New England. Moreover, PCA is also quite unlikely to bind regulators in future crises.

The first section of the paper describes the data and methodology used in this study. The second section investigates the determinants of the imposition of formal regulatory actions by bank supervisors. The third section investigates the circumstances in which PCA-based intervention would have filled the gaps in the existing formal action intervention framework. The final section offers conclusions.

I.   **Prompt Corrective Action under FDICIA**

The prompt corrective action provisions contained in FDICIA emphasize regulatory initiatives to limit the number and the costs of bank failures by intervening earlier in problem banks and by encouraging banks to become better capitalized. However, PCA was intended to supplement rather than replace the existing supervisory intervention framework, in particular by limiting examiner discretion and possible regulatory forbearance. The focus of PCA is to

intervene in banks after their capital ratios have fallen but well before they are likely to fail, so as to reduce the threat to the deposit insurance fund.

FDICIA requires that bank regulators each quarter assign every bank to one of five regulatory categories, based on its capital, with banks coming under progressively more severe restrictions as they cross capital thresholds that place them in lower categories. Well-capitalized institutions (leverage ratios of 5 percent or higher) are not restricted in any significant way, while adequately capitalized institutions (leverage ratios of 4 percent or higher) need FDIC approval to hold brokered deposits, a very modest restriction for most adequately capitalized institutions. Thus, under PCA provisions, only when an institution becomes undercapitalized are significant actions taken.

Undercapitalized banks (leverage ratios below 4 percent) must adopt a capital restoration plan, suspend dividends and management fees, and restrict growth. Significantly undercapitalized institutions (leverage ratio less than 3 percent) require recapitalization and face restrictions on transactions with affiliates, interest rates paid, asset growth, deposits from correspondents, and hiring or replacing management. Critically undercapitalized institutions (tangible equity to assets 2 percent or less) face the early closure provisions of FDICIA.[2]

Prior to FDICIA, the bank supervision and examination process already provided an opportunity for supervisors to verify that a bank's practices and procedures were consistent with safety and soundness criteria, and to take actions to correct the situation if they were not. Both informal and formal regulatory actions could be used for early supervisory intervention, well before a bank reached the point of failure.

Formal actions are intended to provide specific recommendations for actions to be taken by banks to prevent further deterioration in their financial condition. These recommendations may include improved management information systems, greater oversight of credit risks, and improved reserving procedures. The mandatory provisions instituted against undercapitalized and significantly undercapitalized banks under the PCA guidelines are similar to the conditions commonly imposed on banks under formal regulatory actions. (See Peek and Rosengren 1995b for more details.)

Given that the formal regulatory action framework was already in place prior to PCA and that the conditions imposed by the two procedures overlap substantially, the contribution of PCA to supplementing the existing role of formal regulatory actions lies in intervening more "promptly," either by intervening earlier than would be the case with formal actions or by intervening in problem banks that, for whatever reason, did not receive a formal action. To understand when and why PCA legislation would impose a binding constraint on bank supervisors, we first investigate the determinants of the imposition of formal actions and the extent to which such impositions are related to the PCA capital ratio thresholds. For our purposes, we date the formal action as occurring as of the date of the beginning of the examination that resulted in the formal action.[3]

To determine what factors trigger supervisory intervention in the form of a formal regulatory action, we will estimate the following logistic model:

$$I_{i,t} = b_0 + \beta_1 X1_{i,t-1} + \beta_2 X2_{i,t-1} + \nu_{i,t} \qquad \textbf{(1)}$$

The dependent variable has a value of one if regulators imposed a formal action on bank i in that

quarter, and zero otherwise. The dependent variable includes observations of banks that have not

come under a formal action, as well as each observation of banks coming under a formal action up

to and including the quarter of imposition. Because we are interested in the conditions that

determine the <u>imposition</u> of a formal action, once a bank has a formal action, its subsequent

observations are dropped from the sample. Because the imposition of formal actions is associated

with examination quarters, the equations investigating the determinants of formal actions are

estimated using only those observations that represent exam quarters, since the probability of

receiving a formal action in a nonexam quarter is zero.

We include as explanatory variables a vector of bank-specific factors (X1), each scaled by

assets, including the leverage ratio (K/A), loan loss reserves (LLR/A), loans 30 to 90 days past

due (PD30/A), nonperforming loans (NPL/A), defined as loans 90 days past due or nonaccruing,

other real estate owned (OREO/A), liquid assets (LIQ/A), brokered deposits (BRKDEP/A),

commercial and industrial loans (C&I/A), commercial real estate loans (COMRE/A), and

construction loans (CONSTR/A). We also include a vector of (0,1) dummy variables (X2) that

includes a dummy variable for banks with more than $300 million in assets (LARGE), a dummy

variable for savings banks (SAVE), and a set of state and quarterly time dummies.

If examiners used only capital ratios to trigger intervention, as in the PCA guidelines, the

leverage ratio would be highly significant and each of the other bank-specific variables would be

insignificant. And if the continuous leverage ratio variable is split into a set of dummy variables

for capital ranges, then only the dummy variables reflecting the range of leverage ratios under 4

percent should predict formal actions, to the extent the trigger is consistent with the PCA

thresholds.

Examiners make a decision on whether a formal action is required based on information they obtain at an examination. The PCA criteria, on the other hand, are intended to be applied on the basis of reported bank capital ratios, even in the absence of an exam. Thus, being applied each quarter rather than only in exam quarters, PCA intervention has a potential timing advantage over formal action intervention that could be quite substantial in cases where exams are relatively infrequent. This is offset somewhat by the fact that call report data submitted between exams often are less reliable than those immediately following an exam, particularly because banks tend to be slow to recognize troubled loans and to add enough to loan loss reserves to fully reflect the risks and problems in their portfolios. (See, for example, Jones and King 1992; Gilbert 1993; Dahl, Hanweck, and O'Keefe 1995.)

The data are a pooled time series, cross-section panel of balance sheet and income statement data from bank call reports, supplemented with information on bank structure changes, bank examinations, and formal regulatory actions. The sample includes quarterly observations on all FDIC-insured commercial and savings banks in New England (defined as the First District of the Federal Reserve System) for the period 1989:I to 1992:IV. We begin the sample in 1989 because only formal actions signed after the August 9 enactment of The Financial Institutions Reform, Recovery, and Enforcement Act of 1989 are publicly available, with the associated exam dates beginning in early 1989. The sample ends in December 1992 to coincide with the effective date of the PCA regulations. The resulting panel includes 469 individual commercial and savings banks and 1110 observations.[4]

II.   Empirical Results

Table 1 provides the results of estimating equation 1. The first column is estimated with the leverage ratio, a continuous variable, and the second column replaces the leverage ratio with a set of dummy variables for leverage ratio ranges. In both specifications, the leverage ratio is highly significant, consistent with the emphasis placed on capital ratios in PCA. However, a variety of other variables are highly significant determinants as well.

Loans that are 30 to 90 days past due provide some indication of future problems with credit risk in the loan portfolio. The coefficient on loans 30 to 90 days past due is positive and significant in both specifications. The coefficient on OREO is positive and significant at the 1 percent level in both specifications, indicating that a higher value of OREO relative to assets significantly increases the probability of receiving a formal action. Two measures of portfolio concentration, C&I loans and commercial real estate loans, have positive coefficients that are significant in both equations.

The estimated coefficient on loan loss reserves is significant only in the second equation, and one might find its positive sign surprising. However, the positive effect is consistent with an interpretation that, after controlling for portfolio concentrations in risky loan types and problem loans, a high loan loss reserve reflects greater than normal problems with nonperforming loans. Implicit in this interpretation is the assumption that banks have not reserved sufficiently for their problem loans.[5]

The second column shows that the effect of the leverage ratio rises and then falls as the leverage ratio declines, with the maximum effect occurring at the 4 to 5 percent ("adequately capitalized") range. Interestingly, banks considered well capitalized under PCA still have a significant probability of receiving a formal action. The dummy variables for leverage ratios from

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6 to 8 percent and from 5 to 6 percent each have coefficients that are positive and significant at the 1 percent level.[6]

Another interesting finding is that as the leverage ratio ranges fall below 4 percent, the effect on the probability of receiving a formal action declines. In fact, for banks with a negative leverage ratio, the coefficient is negative but insignificant. This is consistent with the need for early closure rules, since it indicates that banks with very low capital are still operating without formal regulatory actions. While this may reflect regulatory forbearance, it may also indicate that examiners feel no need to impose formal actions on banks whose closure or acquisition by affiliates is imminent.

The bottom portion of Table 1 contains summary information. For the first equation, the mean fitted probability for those observations with a value of one is nearly four times that for observations with a value of zero, and for the second equation, it is nearly five times that for observations with a value of zero. Thus, the equations do a very good job of distinguishing between formal action quarters and non-formal action quarters. Based on a threshold value of 0.137, equal to the proportion of observations equal to one, only 15.1 percent of the observations of an imposition of a formal action are missed in the first equation and only 14.5 percent in the second equation.[7] For observations equal to zero, only 20.7 and 16.9 percent are missed in the first and second equations, respectively.

However, one could argue that interpreting all of these observations as misses is an overstatement. For example, many of the "missed" predictions occur because the logit identifies a bank as a problem bank before the bank actually receives a formal action. If a bank has a high fitted probability in quarters prior to receiving a formal action, each of these observations will be

identified as being incorrect. Yet, identifying problem banks earlier is obviously a strength rather than a weakness of the equation. In this case, over one-quarter of the "misses" in each column (60 of 198 and 43 of 162, respectively) are instances of such early identification of banks that eventually received formal actions.

For those banks crossing the PCA 3 percent and 4 percent leverage ratio thresholds during the 1989:I to 1992:IV period, Table 2 provides evidence on the timing of a bank's first crossing the thresholds relative to its receiving a formal action. If a bank crossed a PCA threshold during this period and received a formal action, it is recorded in the row reflecting the timing of the imposition of the formal action relative to the quarter that it crossed the PCA threshold. Negative numbers indicate that the formal action occurred before the leverage ratio threshold was crossed, while positive numbers indicate that the formal action occurred after the threshold was crossed. If only one or neither of these events occurred, or if the bank was already below the leverage ratio threshold at the beginning of 1989, the bank is included in the summary data at the bottom of the table.

It is striking how few of the institutions receiving formal actions are affected by the PCA provisions, which are activated when a bank becomes classified as either undercapitalized (falls below the 4 percent threshold) or significantly undercapitalized (3 percent threshold). The first column shows that 45 banks received formal actions before being deemed undercapitalized, and another 78 banks receiving formal actions remained above the threshold. In addition, three banks that had fallen below the thresholds prior to 1989 each received a formal action, with one formal action preceding the threshold crossing and the other two occurring after the crossing.

Because banks frequently are required to make a significant provision for loan losses as a condition of the formal action, the imposition of the formal action likely accounts for many of the 21 banks crossing the PCA undercapitalized threshold in the quarter of the formal action. If these banks that crossed the threshold in the same quarter as receiving a formal action are included, the PCA guidelines would have had no effect on the timing of the supervisory intervention in 86 percent of the problem banks receiving formal actions. Even more striking, only 7 of the 169 banks receiving formal actions (including the two that crossed prior to 1989) crossed the 3 percent threshold that triggers the more severe PCA provisions before the imposition of formal actions, with four of those crossing in the quarter prior to the formal action. Another 22 banks crossed in the same quarter as the imposition of the formal action.

With respect to the 22 banks that crossed the PCA 4 percent threshold for which PCA intervention would have been more prompt than the formal action intervention that occurred, 60 percent (13) received a formal action in the quarter following the crossing of the PCA 4 threshold, with another eight receiving a formal action in the two subsequent quarters. In each instance, the formal action was associated with the first exam following the crossing of the leverage ratio threshold. The remaining bank appears to represent a case where PCA would have made a substantial difference in the timing of the supervisory intervention. This bank did have an exam following the threshold crossing, at which time supervisors chose not to impose a formal action. However, one could view this as "no harm, no foul," since the bank did not fail.

Two of the three banks that entered our sample with leverage ratios below even the 3 percent threshold fall into the same category. They also were allowed to operate for some time after falling below the leverage ratio thresholds without a formal action, even though they were

examined during the interim between the threshold crossing and the eventual imposition of a

formal action. One could argue that the delay in these two cases, as well as in the case described

at the end of the previous paragraph, represents the type of supervisory discretion that PCA was

intended to curb. However, it is difficult to argue that supervisors were wrong to delay

intervention in these particular instances, insofar as none of the three banks failed and thus did not

impose costs on the deposit insurance fund. On the other hand, one could argue that earlier

intervention might have enabled the banks to recover sooner.

III.   Filling the Gaps with PCA

<u>Banks with Subsequent Formal Actions</u>

Table 3 takes a closer look at the 22 banks (shown in Table 2) that crossed the 4 percent

leverage ratio threshold before receiving a formal action. Because formal actions are associated

with examinations, Table 3 focuses on two events, the last exam prior to crossing the 4 percent

leverage ratio threshold and the subsequent exam, in an attempt to understand why formal actions

were not imposed earlier on this set of banks. The table includes information on the timing of the

two exams relative to the threshold crossing, the leverage ratios at the exams, and, for those

observations in our regression sample, the probability of receiving a formal action based on the

estimated equation in the first column of Table 1.[8]

The banks shown in Table 3 are ordered by the length of time that elapsed between the

exam prior to the 4 percent leverage ratio threshold crossing and that crossing. That period, on

average, was in excess of one year, with a high of 11 quarters. It is interesting that eventual

failure (indicated in the final column of the table) seems to be correlated with the length of time

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since the exam. Seven of the eight banks that crossed the leverage ratio threshold five or more quarters after their prior exam failed. Only five of the 14 remaining banks eventually failed.

At the exam prior to crossing the 4 percent leverage ratio threshold, 18 of the 22 banks were well capitalized (leverage ratios in excess of 5 percent), with the four exceptions having been examined in one of the two quarters preceding the threshold crossing. Thus, based on capital ratios alone, none of these banks would be deemed a problem bank.

Each of these 22 banks had an examination within three quarters of crossing the LR4 threshold. In five cases, the leverage ratio had risen above 4 percent by the time of the exam. None of the 22 banks had predicted probabilities of receiving a formal action below 0.137, with an average probability of 0.520. In all but one instance, the banks received a formal action as a consequence of the exam. The lone exception received a formal action at its next exam, four quarters later, yet even with the delay did not fail.

For comparison purposes, the table also shows for each bank the out-of-sample predicted probability of receiving a formal action at the quarter in which it crossed the LR4 threshold. While the average probability is slightly lower than that for the exam subsequent to the crossing, each of the banks has a probability in excess of the 0.137 threshold, indicating that each was at the time a likely candidate to receive a formal action. This suggests that much of the timing advantage that can be attributed to PCA may be due simply to the fact that PCA intervention can be based on quarterly reported data, rather than only on examination data, which are less frequently available.

Banks That Did Not Receive a Formal Action

The 39 banks (Table 2) that crossed the undercapitalized threshold that triggers the first

stage of PCA intervention but never received a formal action (30 for the 3 percent leverage ratio

threshold that triggers the stronger PCA restrictions) are the instances where PCA legislation has

the greatest potential impact for plugging the holes in supervisory intervention. These cases

might be deemed "misses" in terms of timely supervisory intervention, since regulators did not

intervene with formal actions despite the depleted capital at these banks.

Of the 39 banks, only five still operate as independent entities. Four of the five are

affiliates of large holding companies that could provide additional capital to their troubled

subsidiary. The one surviving bank not part of a large holding company barely fell below 4

percent before improving its capital ratio. Another 15 banks were merged with affiliate banks,

most of which had, or would soon have, a formal regulatory action of their own. In each case, the

acquisition occurred, or the target bank recovered, soon after breaching the PCA threshold.[9]

The remaining 19 banks failed. Table 4 presents data on these 19 banks concerning the

timing and conditions at the last two examinations prior to failure, as well as at the time the banks

crossed the 4 percent leverage ratio threshold. The banks are ordered by the number of quarters

that elapsed between the bank's last examination and its last call report. These banks tended to

fail soon after crossing the 4 percent leverage ratio threshold, on average filing only 2.53

subsequent call reports. The elapsed time was even shorter between the last exam and the last call

report filed, averaging only 1.9 quarters.

Fifteen of the 19 banks failed within four quarters of crossing the undercapitalized

threshold (filed three or fewer subsequent call reports). Of the remaining four banks, the two that

filed four subsequent call reports declined below the 4 percent threshold only for a single quarter

before rising above the threshold and then falling permanently below the 4 percent ratio. The times before failure from the final decline for these two banks were only two and three quarters, respectively. Only two of the 19 banks failed more than a year after falling permanently below the 4 percent leverage ratio threshold.

The very short time span between crossing the threshold and failure may explain the absence of formal actions in many of these 19 instances. Delays in the official closure of a bank well after the closure decision has been made are not uncommon, while the FDIC attempts to find a bidder for the failed bank or at least for some portion of the bank. In addition, given the delay between the identification of the problems and the actual signing of a formal action, a formal action may well have been in process for many of these banks, with failure occurring before the formal action was actually signed. Thus, an important question is whether bank examinations occurred early enough to permit a formal action to be formulated and imposed before the bank ceased to exist.

With respect to this timing issue, four of the 19 banks crossed the 4 percent threshold after their last exam, four crossed in the same quarter as their last exam, and 11 crossed the threshold in the period between the next to last and last exams. As of the next to last exam, none of the 19 banks had leverage ratios below the 5 percent threshold for well-capitalized banks. And, based on the predicted probability calculated from the estimated equation (shown in column 3 of Table 4), only two of the 13 banks that were in the sample at that time had probabilities of receiving a formal action greater than the 0.137 (the proportion of observations with a formal action). Thus, little indication was given of problems at these banks at their next to last exam.

On the other hand, by the time of their last exam, on average nearly five quarters later, 14 of the 19 banks had leverage ratios below the 4 percent threshold and 17 of the 18 banks in the regression sample had predicted probabilities above the 0.137 threshold, with an average probability of 0.651.[10] The one exception was a bank whose capital ratio declined below the threshold for a single quarter as a result of push-down accounting, before recovering to 8.61 percent in the subsequent quarter. The high capital ratio in this quarter accounts for the low probability of receiving a formal action. However, when the bank's capital ratio declined permanently below the 4 percent threshold in the next quarter, the predicted probability of its receiving a formal action soared to 0.816. Thus, each of the 18 failed banks in our regression sample was identified as having characteristics sufficient for receiving a formal action before its failure. However, little time was left to formulate and impose formal actions before the banks failed.

IV.   **Conclusion**

This paper has examined the circumstances of supervisory intervention during the New England banking crisis immediately prior to the effective date of FDICIA, which contained prompt corrective action legislation intended to supplement the existing supervisory authority in an effort to eliminate (or at least limit) regulatory forbearance. However, prior to the adoption of PCA, regulators already were imposing formal actions on banks before their capital fell to levels considered undercapitalized under PCA. Thus, PCA can be expected to have little effect in removing discretion from examiner intervention and in causing examiners to act more promptly.

While the PCA legislation may fill a few gaps in supervisory intervention, it appears to have been oversold. Had PCA been in place during the last New England banking crisis, it appears that it would have had little, if any, effect. Since it imposes an essentially nonbinding constraint on bank supervisors, PCA is not likely to play a major role in preventing, or even mitigating, the next banking crisis. Thus, if policymakers have taken comfort from the early intervention features of FDICIA, that confidence may be misplaced. One redeeming feature of FDICIA in this respect is the legislation requiring more frequent examinations. To the extent that leverage ratios are a lagging indicator of bank financial health, more frequent exams will tend to make reported leverage ratios more timely and more accurate indicators of a bank's financial health. In that sense, FDICIA may indeed contribute to earlier identification of, and intervention in, problem banks.

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Footnotes

1. On the other hand, given that reported capital ratios are notoriously inaccurate indicators of the actual financial health of a bank (see, for example, Jones and King 1995), the early closure provision, by raising the capital ratio threshold that could trigger bank closure, should be expected to reduce, but not eliminate, the resolution costs of failed banks. And, in fact, Billett, Coburn, and O'Keefe (1995) find that overall resolution costs have decreased since the enactment of FDICIA.

2. See Peek and Rosengren (1996) for more detail. The use of capital ratio thresholds as the trigger to initiate supervisory actions against banks is consistent with recent banking legislation that has emphasized bank capital. With the acceptance of the Basle Accord, which introduced risk-based capital regulation of banks in the major industrialized countries, and the adoption of additional leverage ratio capital requirements in the United States, bank supervision and regulation increasingly have emphasized the need for adequate bank capital. While capital thresholds are stated in the PCA provisions in terms of both leverage ratios and risk-based capital ratios, we focus only on leverage ratio thresholds. First, risk-based capital ratios are not available before 1990. Second, for the period in New England under study here, leverage ratios (the CAMEL-adjusted requirements or the 6 percent requirement typically included in formal regulatory actions) rather than risk-based capital ratios tended to be the binding constraint on capital-constrained banks.

3. The standard practice of the FDIC is to date examinations (which are usually reported in the formal actions) as of the beginning of the exam. The OCC, on the other hand, typically reports "as of" dates, the date of financial data referred to in the report, often the end-of-quarter call report date immediately preceding the start of the exam. Consequently, when the OCC exam date is the last day of a quarter, we denote the subsequent quarter in which the exam began as the exam quarter. Peek and Rosengren (1995a) have found that bank behavioral responses, such as declines in lending, occur discretely in the quarter in which the exam resulting in the formal action is initiated, consistent with this dating practice.

4. We omit the first eight quarters of call report data of de novo banks, because their capital positions (as well as their loan portfolios and indicators of problem loans) do not yet reflect the characteristics of a fully operational bank.

5. Our findings are consistent with the emphasis by Jones and King (1992) on the systematic measurement errors in both loan loss reserves and OREO, and thus in reported capital ratios.

6. One explanation for banks with such high capital ratios nonetheless receiving formal actions is that they tend to be smaller banks, whose inadequate information systems make it difficult for examiners to make an accurate assessment of their financial health. Consistent with this explanation, banks with a leverage ratio exceeding 10 percent at the time they received a formal action averaged $172 million in assets, compared to $253 million for banks with leverage ratios between 8 and 10 percent and $530 million for banks with leverage ratios between 6 and 8 percent.

7. Measuring goodness of fit is problematic for logistic models. A standard but arbitrary measure is the percentage correctly predicted, based on a 50 percent threshold (predicted=1, if probability>50 percent; predicted=0, if probability<50 percent). However, if the percentage of observations equal to one is substantially less than 50 percent, as is the case here, that threshold can be particularly inappropriate. An alternative, but still somewhat arbitrary, threshold is the actual proportion of observations equal to one, here 0.137.

8. The missing probabilities (here and in Table 4 below) are for observations that require data prior to our sample period or, in a few cases, are observations in the first eight quarters of the existence of a de novo bank, when the data are not representative of a fully operational bank.

9. Of these 15 banks, only one did not have a predicted probability of receiving a formal action in excess of 0.137 at the time it crossed the threshold, and usually before then. The exception was a bank with a leverage ratio that fell to 3.99 for a single quarter and rose above 4.5 percent the next quarter before being acquired in the subsequent quarter. Presumably, for this set of survivors and acquired banks, the imposition of a formal action was made unnecessary by an expected capital infusion from a parent or by an impending acquisition, by either a better capitalized affiliate or an affiliate with a formal action.

10. The one bank not in the regression sample was a de novo bank that underwent a single examination in one of its first eight quarters of operation, six quarters before its failure and five quarters before it crossed the PCA 4 percent leverage ratio threshold.

Table 1
 Determinants of Formal Actions, New England Banks, 1989:I to 1992:IV

Constant	-3.795** (2.73)	-6.818** (4.67)	
K/A	-.213** (4.40)	-	
8-10% K/A	-	.376 (.64)	
6-8% K/A	-	1.512** (2.90)	
5-6% K/A	-	1.860** (3.35)	
4-5% K/A	-	3.243** (5.55)	
3-4% K/A	-	3.169** (4.35)	
2-3% K/A	-	2.452** (3.48)	
1-2% K/A	-	2.224* (2.54)	
0-1% K/A	-	.356 (.15)	
<0% K/A	-	-1.374 (.98)	
LLR/A	.218 (1.65)	.302* (2.07)	
PD30/A	.165** (2.71)	.156* (2.36)	
NPL/A	.012 (.22)	.002 (.03)	
OREO/A	.156** (3.26)	.193** (3.85)	
LIQ/A	-.001 (.07)	.005 (.33)	
BRKDEP/A	.035 (1.45)	.036 (1.40)	
C&I/A	.036* (2.52)	.031* (2.01)	
COMRE/A	.047** (3.22)	.048** (3.05)	
CONSTR/A	.022 (.66)	.012 (.32)	
LARGE	-.139 (.56)	-.307 (1.16)	
SAVE	-.067 (.23)	-.020 (.06)	
Likelihood	-312.26	-283.69	
Observations	1110	1110	
Observation=1	152	152	
Proportion of observations=1	.137	.137	
Mean fitted probability of observations=1	.374	.430	
Mean fitted probability of observations=0	.099	.090	

Based on θ = .137	Number	Percent	Number	Percent
Predicted=1, actual=1	129	84.9	130	85.5
Predicted=1, actual=0	198	20.7	162	16.9
Predicted=0, actual=0	760	79.3	796	83.1
Predicted=0, actual=1	23	15.1	22	14.5

Note: Each equation also contains a set of state and quarterly time dummy variables. Absolute values of t-statistics are in parentheses.
* Significant at the 5 percent level.
** Significant at the 1 percent level.

Table 2
Quarters from Crossing of Leverage Ratio Thresholds until Formal Action, New England Banks,
1989:I to 1992:IV
Number of Banks

Quarters until Formal Action		PCA Leverage Ratio Threshold	
		4 Percent	3 Percent
-7		0	1
-6		1	3
-5		9	13
-4		9	3
-3		5	8
-2		14	15
-1		7	1
(Threshold Crossed)	0	21	22
1		13	4
2		6	0
3		2	0
4		0	0
5		0	0
6		1	1
Crossed Threshold, received Formal Action[a]		88	71
Crossed Threshold, never received Formal Action		39	30
Remained above Threshold, received Formal Action[b]		78	95
Remained above Threshold, never received Formal Action		304	313
Below Threshold prior to 1989, received Formal Action[c]		3	3
Below Threshold prior to 1989, never received Formal Action		0	0
Total Banks in Study		512	512

[a] Includes four banks that received formal actions in 1988 and three banks that received formal actions in 1993.
[b] Includes one bank that received a formal action in 1987 and six banks that received formal actions in 1993.
[c] Includes one bank that received a formal action in 1988 and one bank that received a formal action in 1993.

Table 3
Characteristics of Banks Receiving a Formal Action after Crossing the 4 Percent Leverage Ratio Threshold

Bank	Exam Prior to Crossing LR4			Quarters Since LR4	Subsequent Exam			Probability of FA at LR4 Crossing	Failed
	Quarters Prior to LR4	Leverage Ratio	Probability of FA		Leverage Ratio	Probability of FA	Received FA		
1	11	7.88	-	1	1.20	.568	Yes	.179	Yes
2[a]	10	5.38	-	1	2.83	.556	Yes	.481	No
3	8	10.34	-	1	2.07	.750	Yes	.462	Yes
4	8	9.59	-	1	2.91	.438	Yes	.201	Yes
5	8	7.35	.029	1	2.45	.575	Yes	.614	Yes
6	8	6.01	-	2	1.94	.553	Yes	.283	Yes
7	6	8.02	.337	1	3.62	.461	Yes	.770	Yes
8	5	7.74	-	2	1.13	.826	Yes	.360	Yes
9	4	6.48	.065	2	4.24	.234	Yes	.153	No
10	4	6.46	.057	1	2.39	.463	Yes	.379	No
11	4	5.57	.124	2	3.23	.481	Yes	.379	No
12	3	6.23	.230	2	3.99	.326	No	.655	No
13	3	6.00	.104	1	2.84	.577	Yes	.506	Yes
14	3	5.63	.182	1	2.52	.725	Yes	.513	Yes
15	3	5.37	.333	3	3.98	.170	Yes	.390	No
16	2	7.11	.228	1	4.50	.503	Yes	.616	No
17	2	5.73	.385	2	3.25	.692	Yes	.634	Yes
18	2	5.23	.151	2	2.61	.743	Yes	.223	Yes
19	2	4.22	.516	1	4.11	.568	Yes	.535	No
20	1	4.61	.199	1	-1.45	.729	Yes	.453	Yes
21	1	4.34	.352	1	4.68	.137	Yes	.238	No
22	1	4.21	.255	3	5.25	.355	Yes	.491	No
Average	4.5	6.34	.222	1.5	2.92	.520		.432	

[a] This bank had an exam in the quarter it crossed LR4, as well as another exam in the subsequent quarter.

Table 4
Characteristics of Failed Banks Not Receiving a Formal Action

Bank	Next to Last Exam			Last Exam				Probability of FA at LR4 Crossing	Quarters to Last Call Report from LR4 Crossing
	Quarters Since Previous Exam	Leverage Ratio	Probability of FA	Quarters Since Previous Exam	Leverage Ratio	Probability of FA	Quarters to Last Call Report		
1	-	13.97	-	6	1.18	.847	0	.929	1
2	-	5.00	-	4	-4.45	.961	0	.188	3
3	4	6.38	.310	5	-7.01	.996	0	.646	2
4	7	5.74	.082	6	-7.82	.962	0	.447	3
5[b]	4	5.98	.038	4	0.05	.488	1	.072	4
6	3	7.73	-	7	1.43	.954	1	.954	1
7[a]	7	6.75	.293	3	2.75	.718	1	.718	1
8	11	6.16	.097	7	2.54	.848	1	.625	2
9	5	10.51	.016	3	0.05	.319	2	.319	2
10	5	7.95	.026	6	1.37	.575	2	.296	5
11[a]	5	9.51	-	6	6.38	.615	2	.878	1
12[a]	8	9.51	.028	5	1.76	.632	2	.492	3
13	6	5.88	.097	5	3.12	.474	2	.460	3
14	5	6.86	.049	4	2.11	.536	3	.536	3
15[b]	3	9.91	-	5	8.61	.125	3	.392	4
16	2	6.84	.032	5	5.30	.300	4	.902	2
17	5	6.38	.038	3	1.24	.532	4	.684	5
18	8	6.85	.128	4	4.00	.836	4	.845	3
19[c]	-	-	-	-	14.79	-	5	.996	0
Average	5.5	7.66	.095	4.9	1.97	.651	1.9	.599	2.53

[a] Last exam is taken as first of two exams in adjacent quarters, with the second exam treated as a continuation of exam begun in prior quarter.

[b] Fell below 4 percent threshold for one quarter and then rose above the threshold before permanently declining below the threshold.

[c] Bank does not enter our regression sample because it was a de novo bank that had only a single exam during its life, with the exam occurring during one of its first eight quarters omitted from our sample.