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# Are Bank Holding Companies a Source of Strength to Their Banking Subsidiaries?

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**Abstract**

I present evidence that the cross-guarantee authority granted to the FDIC by the Financial Institutions Reform, Recovery, and Enforcement Act of 1989 has unexpectedly strengthened the Federal Reserve's source-of-strength doctrine. In particular, I find that a bank affiliated with a multi-bank holding company is significantly safer than either a stand-alone bank or a bank affiliated with a one-bank holding company. Not only does affiliation reduce the probability of future financial distress, but distressed affiliated banks are more likely to receive capital injections and recover more quickly than other banks. Moreover, the effects of affiliation are strengthened for an expanding bank holding company. However, the effects of affiliation are weakened when the parent has less than full ownership of the subsidiary. Most interestingly, my results show that these differences in behavior across affiliation did not exist before 1989, when the cross-guarantee authority was introduced.

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## I. Introduction

In February 1987, the Federal Reserve Board issued a cease and desist order against *Hawkeye Bankcorp* alleging unsafe banking practices for not injecting capital into one of its failing agricultural banks. While the bank holding company refused to act and its subsidiary failed, it was the first time that the Board had taken such an action and appeared to signal a significant change in policy.[1] Two months later, the Board issued a formal policy statement indicating that in its view a failure by the parent holding company to act as a source-of-strength to a troubled banking subsidiary when resources were available would be considered it to be an unsafe and unsound banking practice.[2] While this policy statement was only meant to "[clarify] existing agency practices developed over the course of the Board's enforcement activities," it was aggressively challenged by the banking industry without positive results for the Federal Reserve.[3] Even though the Board maintains in Regulation Y

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[1] Much of the background material here is drawn from Keeton (1990) and Weinstein and Albert (1998), which provide an excellent discussion of the history of the source-of-strength doctrine and cross-guarantee provision of FIRREA.

[2] Since the enactment of the Bank Holding Company Act in 1956, the Board has formally stated in Regulation Y (12 USC 225.4(a)(1)) that it expects a bank holding company to act as source of managerial and financial strength to its subsidiaries, but this view was initially enforced only by the threat to decline applications for new lines of business and mergers by a parent company. This so-called weak form of the source-of-strength doctrine was validated by the U.S. Supreme Court in *Board of Governors v. First Lincolnwood Corp., 439 U.S. 234 (1978),* overturning a decision of the Seventh Circuit.

In 1984, the Board adopted a stronger form of the doctrine by amending Regulation Y with language demanding that a bank holding company "not conduct its operations in an unsafe or unsound manner." The 1987 policy statement made it clear that the Board would use cease and desist orders to force a parent bank holding company to provide financial support to a distressed banking subsidiary the enforcement of this amendment.

[3] During the failure of Texas bank holding company *Mcorp* in 1988, the Federal Reserve Board pressured the parent to use $400 million in non-bank assets in order to assist its 20 failing subsidiaries without success. After bankruptcy, the Federal Reserve tried to get these non-banking assets transferred to the failed banks on the grounds that *MCorp* had violated the source-of strength doctrine. While a federal appeals court ruled that the Federal Reserve did not have the authority under the Bank Holding Company Act to force a parent to inject capital into a failing subsidiary, the U.S. Supreme Court later dismissed the case in *MCorp Financial, Inc v. Board of Governors, 900 F.2d 852 (1991)* on a jurisdictional matter without addressing the doctrine's legality. The quote in the text comes from a brief to the Supreme Court filed by Solicitor General Kenneth Star in February 1991 on behalf of the Board of Governors in arguing the *MCorp* case.

Moreover, Tanoue (1999) reports that the has FDIC has actually settled two cases (*First RepublicBank Corporation* and the *Bank of New England*) where the parent of a failed bank has sued the receivership to recover funds and assets that were downstreamed by the holding company before failure under the source-of-strength doctrine. The latter case in 1999 with a payment of $140 million to the bankruptcy estate.

to date that bank holding companies are expected to use all available resources to support their banking subsidiaries, Weinstein and Albert (1998) argue that the legal history might be interpreted "[as denying] the Federal Reserve the right to require capital contributions by bank holding companies to troubled subsidiary banks." [4]

In response to the banking crisis of the late 1980s and in part to the legal challenges presented by the banking industry, Congress granted to the FDIC the authority through the cross-guarantee provision of the Financial Institutions Reform, Recovery, and Enforcement Act of 1989 (FIRREA) to charge off any expected losses from a failing banking subsidiary to the capital of non-failing affiliate banks.[5] Bank holding companies responded with the argument that this authority represents a taking of private property without just compensation, but the courts have firmly upheld the cross-guarantee provision on two separate occasions. [6] While some have argued that the cross-guarantee authority of the

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[4] The Board has been given the authority in Section 131 "Prompt Corrective Action" of the Federal Deposit Insurance Corporation Act of 1991 (12 USC 1831o) to force a parent bank holding company to guarantee the performance of a troubled affiliate as part of a capital restoration plan, implemented through Subpart D of Regulation H (12 CFR 208.44). The liability of the parent's guarantee is limited by the minimum of five percent of subsidiary assets at the time it is identified as undercapitalized or the amount of capital necessary to bring the troubled subsidiary into compliance with the capital restoration plan at the time of non-compliance.

This authority is limited, however, in the case of financial holding companies with non-bank financial subsidiary that is a registered broker-dealer, a registered investment advisor, or an insurance company. In particular, the Board may not downstream capital if the functional regulator of the company determines that such an action would have a "material adverse effect on the financial condition" of the regulated non-bank financial subsidiary. While the Board has the power to order the holding company to divest the subsidiary, the parent has up to 180 days to respond to this action.

[5] Ashcraft (2003) details the use by the FDIC of the cross-guarantee provision during the failure of *First City Bancorporation* in 1992, when the failure of lead banks in Dallas and Houston precipitated the failure of 18 non-lead subsidiaries. As the FDIC expected losses of more than $500 million and these other subsidiaries held less than $300 million in equity capital, they were closed by the insurer.

[6] The first challenge to the FIRREA provision took place in *Meriden Trust & Safe Deposit Co. v. FDIC, 62 F. 3d 449 (2d Cir. April 17, 1995)*. *Central Bank* became insolvent in 1991 after receiving almost all assets and liabilities from *Meriden Trust*, a sister bank. *Meriden Trust* ceased its day-to-day commercial banking operations after the transfer but maintained deposit insurance to retain the abilities of a full service bank. Since both banks were controlled by the same bank holding company and *Meriden Trust* continued to have deposits and benefit from deposit insurance, the FDIC assessed the losses ($152 million) that it incurred in the bailout under the cross guarantee provision. *Meriden Trust* appealed the FDIC's action but

FDIC makes the source-of-strength doctrine irrelevant, this might not be the case for at least two grounds.[7] First, the FDIC does not have the authority to use capital behind the non-banking assets of a bank holding company to defray the expected costs of bank failure. In contrast, the source-of-strength doctrine demands that a bank holding company use the resources in banking and non-banking subsidiaries to support a distressed subsidiary bank. More importantly, the FDIC cannot exercise its authority until the subsidiary bank has already failed. In contrast, the source-of-strength doctrine involves the transfer of capital to a distressed subsidiary to prevent failure. This latter point becomes even more important given recent evidence documented by Ashcraft (2003) that even healthy bank failures are followed by significant and permanent declines in real economic activity.

After more than a decade of regulation, legislation, and litigation, it seems natural to ask, what has been accomplished? The observed resistance by the banking industry to the source-of-strength doctrine in the courts suggests that regulators are trying to force bank holding companies to do something that they otherwise would not be willing to do. On the other hand, it seems possible that despite legal setbacks for the Federal Reserve, the cross-guarantee provision has actually enhanced the source-of-strength doctrine by removing the incentives of bank holding companies to resist enforcement. With the FDIC waiting to claim

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The United States District Court for the District of Connecticut upheld the cross-guarantee as constitutional and the Second Circuit affirmed this decision.

The other significant challenge to the FIRREA provision occurred in *Branch on behalf of Maine National Bank v. United States. 69 F.3d 1571 (November 13, 1995). The Bank of New England Corporation*, a holding company owning the *Bank of New England* and *Connecticut Bank and Trust Co*., acquired *Maine National Bank* in 1985. *Bank of New England* was facing financial difficulties in 1989 as a consequence of a crash of the New England real estate market and failed in 1991. The FDIC assessed the total expected loss against *Maine National Bank* using the cross-guaranty provision, triggering also the insolvency of *Maine National Bank* (at the time, *Maine National Bank* was solvent with a net worth of approximately $65 million). In 1994 the Court of Federal Claims agreed that the cross-guarantee provision violated the Takings Clause of the Fifth Amendment, constituting a taking without just compensation. However, the Federal Circuit Court of Appeals reversed the decision in 1995 on grounds that banks are required to share liability for losses caused by sister bank failures because the main goal of FIRREA's cross guarantee provision is protecting private parties and making the deposit insurance system self-sufficient.

the capital in non-failing banking subsidiaries, a bank holding company no longer has the option of walking away from a distressed subsidiary, making the parent more agreeable to taking steps to prevent the subsidiary's failure in the first place. In fact, the evidence developed below is entirely consistent with this conjecture.

In the academic literature, the only existing empirical study of the link between affiliation with a multi-bank holding company and distressed bank behavior is Gilbert (1991), which documents that affiliated problem banks are more likely to receive a capital injection than unaffiliated problem banks.[8] However, an alternative explanation for the link between affiliation and capital injections is suggested by a growing literature on the operation of internal capital markets in bank holding companies. Using a sample of approximately 300 publicly-traded multi-bank holding companies 1986-1989, the Houston, James, and Marcus (1997) demonstrate that subsidiary loan growth is more sensitive to the cash flows and capital position of the holding company than the cash flows and capital position of the subsidiary.[9] More recently, Ashcraft (2001) finds evidence of differential access to the federal funds and large CD market for banks associated with multi-bank holding companies, where affiliated banks are better able to shield the effect of a monetary contraction on bank loan supply by replacing insured deposits with external funds.[10] Given the presence of

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[7] See, for example the position of *MCorp.* in Star (1990).

[8] Schinski and Mullineaux (1995) use an event-study methodology to conclude that the announcement of the source of strength policy was associated with significantly negative excess stock returns for multi-bank holding companies, where the excess returns were more negative for holding companies with a problem subsidiary.

[9] An important caveat to these results comes from Chevalier (2000), which uses a sample of firms that undertake diversifying mergers between 1980 and 1995 to illustrate that investment patterns that the literature has attributed to cross-subsidisation between divisions are apparent in the pairs of merging firms *prior* to their mergers. This fact suggests that some of these results might be attributable to selection bias.

internal capital markets, it is plausible that a parent holding company would support a distressed subsidiary even in the absence of regulation.

The challenge of identifying the effect of regulation on behavior involves figuring out how a bank holding company would have acted under a different regulatory regime. A natural solution to this problem would be to compare the behavior of bank holding companies before the granting of cross-guarantee authority to their behavior after it was enacted through FIRREA in 1989. A first pass at these questions appears in Figure 1, which highlights two main points of the paper. The figure illustrates the fact that MBHC-affiliated banks (circles) recover more quickly from financial distress than unaffiliated banks (triangles).[11] Panel (a) plots the probability that a distressed bank remains distressed after one year, controlling for differences in bank characteristics. While there is little difference in the probability of distress in the early years of the sample, there is a noticeable drop in the probability of distress for affiliated banks relative to unaffiliated banks soon following FIRREA in 1989. A similar pattern appears in panel (b), which plots the probability that the bank remains distressed after two years. Over the period 1986-1999, about 50 percent of distressed banks remained distressed two years in the future, but affiliation reduced the probability of future distress on average by about 6 percent.

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[10] More interestingly, Ashcraft (2001) finds evidence that while affiliation reduces the sensitivity of bank lending to insured deposits and helps banks shield lending from changes in the federal funds rate over the period 1987-1999, there is so such evidence over the period 1976-1986, where only the later time period would be affected by the stronger form of source of strength regulation.

[11] Financial distress is defined by a bank having a composite CAMEL rating of 3, 4, or 5. Figure 1 uses the sub-sample of financially distressed banks and plots the residuals from a regression of a dummy variable for financial distress one or two years into the future on bank characteristics. These controls include log assets, the ratio of equity to assets, loan portfolio shares, loan performance, the ratio of other real estate owned to assets, the ratio of large deposits to assts. Figure 2 plots the residuals for the sub-sample of non-distressed banks.

In contrast, consider the behavior of healthy banks. Panel (a) of Figure 2 plots the probability that a healthy bank becomes distressed after one year, controlling for differences in bank characteristics. MBHC-affiliated banks (circles) are less likely to become distressed than unaffiliated banks (triangles), as if the parent company takes pre-emptive action to keep subsidiaries out of trouble, but this difference does not become stronger over time. This pattern also appears in panel (b), which plots the probability that the bank becomes distressed after two years. While only 6 percent of healthy banks became distressed two years into the future over 1986-1998, affiliation reduced the probability of future distress on average by 1.4 percentage points.

The visual differences-in-differences contains most of the key results developed in the paper. While bank holding companies worked to keep healthy subsidiaries out of distress before FIRREA, they were largely ineffective in helping out a distressed subsidiary. Moreover, the cross-guarantee provision of FIRREA appears to have had a significant effect on the behavior of parent companies of distressed subsidiary banks, prompting capital injections that otherwise would not have occurred and helping these institutions recover from distress more quickly.

The paper proceeds as follows. An overview of the data employed is in Section II, results are discussed in Section III, and Section IV concludes.

## II. Data

I use annual (December) data on the financial condition of all insured commercial banks from 1986-1999, which can be matched with supervisory data about bank condition. Summary statistics are displayed in Table 1. Affiliation with a bank holding company is identified using the regulatory high holder (RCFD9348). Multi-bank holding companies are identified by counting the number of banks with the same regulatory high holder. The first row of the table indicates that about 30 percent of the bank-years in the sample belong to affiliates of a multi-bank holding company. Affiliated banks appear to be a little larger than other banks in line 2, have about one percentage point less in equity relative to assets in line 3, and have lower fraction of non-performing loans in line 6.

CAMEL ratings are a confidential measure of bank financial condition by regulators. The underlying supervisory data starts in 1986, and I construct a data set indicating a bank's most recent rating as of December of each year. Financial distress is defined by a CAMEL rating of 3, 4, or 5, while banks with ratings of 1 or 2 are considered to be healthy. Line 7 of Table 1 indicates that about 16 percent of bank-years involve a distressed subsidiary bank, although affiliated banks are less likely to be distressed than stand-alone banks.

The banking assets of the holding company are defined as the sum of bank assets (RCFD2170) across all banks with the same regulatory high holder. I construct the dummy variable LARGE which is equal to one when the consolidated banking assets of the holding company are more than ten times the assets of the distressed subsidiary, and then interact affiliation with LARGE. Line 9 of the table indicates that about 42 percent of subsidiary banks are affiliated with relatively large banking organizations. In order to measure the financial strength of the other banking subsidiaries of the holding company, I construct the

variable CAPITAL, equal to the aggregate primary capital ratio of other banking subsidiaries of the holding company. The variable DISTRESSED indicates the presence of another distressed affiliate in the holding company, and is another measure of financial strength.

While the Federal Reserve can direct a parent to provide assistance to troubled subsidiaries, it is also able to hold up plans for expansion by a parent holding company if it feels that the parent has not been as adequate source of strength to the subsidiary. Below it will be useful to know which bank holding companies are expanding, and thus have a greater incentive to assist troubled subsidiaries in order to remove regulatory barriers to expansion or to satisfy the demands of financial markets who will finance these plans. In order to identify expanding holding companies, I identify regulatory high holders (RSSD9348) that have made an acquisition of a bank in the last year either directly or indirection through the acquisition of a holding company. I construct the variable ACQUISITION, which is a dummy variable equal to one if the parent company has acquired a bank in the last year. Line 11 of Table 1 indicates that 32 percent of affiliated banks are part of an expanding multi-bank holding company.

The incentives of a parent company to assist a troubled subsidiary depend in part on the ownership stake of the parent in the problem bank. In particular, when a parent owns less than 100 percent, it will be less likely to inject capital directly into the bank because this is a transfer to the other owners of the bank. In order to assess the ownership stake of the parent in a subsidiary, I use information on the percent equity owned by a bank's regulator direct holder. I construct the variable OWNERSHIP, which is a dummy variable equal to one if the parent company owns 100 percent of the equity of the distressed subsidiary. Line

12 of the table indicates that an affiliate of a multi-bank holding company has on average sold 80 percent of its equity to the parent company.

Capital injections into a subsidiary are identified from Schedule RI-A. Prior to 1984, I use the net sale of stock (RIAD4346), which includes additions to equity from the parent holding company and affiliates. Starting in 1984, however, there is a separate line item for additions to equity from parent holding company, so injections are defined as the sum of the net sale of stock (RIAD4346) and other transactions with the parent holding company (RIAD4415). Line 15 of Table 1 illustrates injections of equity capital occur in about 12 percent of bank years, with a slightly higher frequency for banks affiliated with a multi-bank holding company. The final two rows of the table illustrate that affiliated banks appear to substitute away from the public issue of stock towards direct infusions of equity by the parent holding company.

**III. Results**

Results are divided into two sections. The first section investigates the effect of affiliation with a multi-bank holding company on bank behavior, focusing on the recovery of a bank from and transition of a bank into financial distress. Using composite CAMEL ratings over 1986-1999 to identify problem banks, I compare the behavior of banks affiliated with multi-bank holding companies to stand-alone banks and banks affiliated with one-bank holding companies. The second section of the paper investigates how the differences between affiliated and unaffiliated banks change following the codification of source-of-strength through FIRREA in 1989.

**1. What is the effect of affiliation with a multi-bank holding company on subsidiary bank behavior?**

The main identification problem in making a causal link between affiliation and bank performance is to identify the counterfactual behavior of a subsidiary bank if it were not affiliated with a multi-bank holding company. It follows that the main threat to identification is that the banks that multi-bank holding companies acquire are somehow different from the stand-alone and one-bank holding company banks used as a control group in the sample. In particular, when a distressed affiliated bank would have recovered more quickly even in the absence of affiliation, a simple difference in future performance across affiliation overstates the causal effect of interest. One way to overcome this problem is to identify differences across multi-bank holding companies that are related to the ability of the parent to assist a troubled subsidiary but unrelated to an individual bank's counterfactual ability to recover in the absence of affiliation. For example, unless the largest multi-bank holding companies acquire banks with the best counterfactual recovery ability, a difference across the banking assets of the holding company will help to address this basic selection problem. In the analysis below, I use two original sources of variation in the incentives of a parent to assist a troubled subsidiary: the acquisition desires of the parent and the ownership percentage of the parent in the subsidiary bank. Another way to deal with selection is to focus the analysis on the behavior of banks that actually become part of a multi-bank holding company over the sample before and after they become affiliated relative to banks that never become part of a holding company. Using the before versus after

difference in recovery rates from distress across affiliation also helps to mitigate some basic selection problems. I employ both strategies in the analysis below.

*Capital injections into distressed banks*

Are banks that are affiliated with multi-bank holding companies are more likely to get capital injections in the event of financial distress? Using the sample of insured commercial banks over 1986-1999 with a most recent CAMEL rating of 3, 4, or 5, I estimate an OLS regression where the dependent variable is a dummy variable indicating a capital injection in the last year on regressors that include a dummy variable for multi-bank holding company affiliation, a set of bank-level controls, and a full set of time effects in panel (a) of Table 2. The bank-level controls used throughout this paper include the ratio of non-performing loans to total loans, controls for loan portfolio concentrations, the log of bank assets, the ratio of equity to assets, the ratio of Other Real Estate Owned to Assets, and the ratio of large deposits to assets. About 20 percent of banks with low CAMEL ratings receive capital injections, and the first column indicates that banks affiliated with a multi-bank holding company are about 8 percent more likely to receive an infusion of equity than other banks.

While the average distressed affiliate appears to receive assistance more frequently than other banks, does the probability of assistance depend on the size or financial condition of other banks in the holding company? The coefficient in the first row of the third column indicates that when the holding company is small relative to the subsidiary (so LARGE = 0), the effect of affiliation on the probability of injection is about 4 percent. On the other hand, when the subsidiary is small relative to the holding company, the probability of assistance

increases by more than 11 percentage points. The variable CAPITAL, equal to the aggregate primary capital ratio of other banking subsidiaries of the holding company, is also interacted this with the dummy for affiliation in the fifth row of the table. Surprisingly, the coefficient is negative, although insignificant, indicating that the financial strength of other subsidiaries is unimportant, although this result will come undone with more controls in column 7. In the second column, the coefficient in the second row indicates that the presence of another distressed subsidiary (so DISTRESSED = 1) actually increases the probability of assistance, so that there appears to be no crowding out of financial resources between distressed subsidiaries.

The interaction of ACQUISITION with affiliation indicates in the fourth row of column 4 that banks affiliated with expanding holding companies are more likely to receive an injection of equity capital than banks that are affiliated with other multi-bank holding companies. The coefficient of almost 13 percent is large, implying that banks affiliated with expanding holding companies receive assistance almost 18 percentage points more frequently than unaffiliated banks. Finally, the interaction of OWNERSHIP with affiliation in the sixth row of column 6 indicates full ownership of the subsidiary increases the probability of a capital injection by about 4.5 percentage points.

In order to deal with fact that holding company characteristics are correlated with each other, I put all of them in at once in the last column of Table 2. The most significant change is the coefficient on the interaction of other subsidiary primary capital ratio with affiliation, which is now positive and statistically significant. The sign flipping presumably arises due to the negative correlation of CAPITAL with LARGE, as the coefficient on relative size

increases. The coefficient in the fifth row implies that a one percentage point increase in the primary capital ratio of other subsidiaries increases the probability of a capital infusion by about 0.38 percentage points. Note how economically small the effect of capital on the probability of an infusion relative to the other variables. While the effect of a distressed subsidiary is still positive in the second row, it is much smaller and is no longer statistically significant.

More interestingly, the interpretations of the interaction of affiliation with ACQUISITION and OWNERSHIP become more powerful given the controls for holding company size and financial condition. In particular, the coefficient in the fourth row indicates that expanding holding companies are more than 10 percentage points more likely to inject capital into a subsidiary conditional on holding company size and strength. This is quite remarkable, as it suggests that while holding companies without expansion plans assist troubled subsidiaries more frequently than unaffiliated banks, they do much less than holding companies of similar size and strength that have expansion plans. Further, the coefficient on OWNERSHIP in the last row of the table indicates that for two holding companies of the same size and strength, the holding company that wholly owns a distressed subsidiary is about 2.4 percentage points more likely to provide assistance than a holding company that only has partial ownership. While this coefficient might seem small relative to the effect of ownership, using the coefficient on CAPITAL in the fourth row, it is equivalent to almost 6 percentage points of aggregate primary capital in other banking subsidiaries of the holding company.

The measure of injections of capital is the sum of the net sale of stock by the subsidiary plus additions to equity capital due to transactions with the parent company. In panels (b) and (c) of Table 2, I break out injections in order to investigate substitution from the issue of equity to direct funding by a parent company. The results generally suggest that affiliation with a multi-bank holding company permits a substitution away from equity issues toward direct infusions of capital by the parent.

The general message from Table 2 is that banks affiliated with a multi-bank holding company are more likely to receive an infusion of equity capital, although it is more likely to be in the form of a direct transfer from the parent than from the net sale of stock. Measures of holding company strength – the relative size and primary capital ratio of other banking subsidiaries – increase the likelihood that a troubled subsidiary receives assistance.

*Escape from Distress*

While there is evidence that affiliated banks receive more assistance, the larger question at the end of the day is does this assistance matter for future bank performance? Table 3 presents evidence on the probability that a distressed bank maintains its poor CAMEL rating one or two years into the future. The first column of panel (a) demonstrates that distressed affiliated banks are less likely to be distressed in one year. While the presence of a distressed affiliate increased the probability of assistance from the parent company, it completely eliminates the benefits that affiliation has on future performance. There are expected effects of relative size and primary capital ratio in the third and fifth rows, respectively. Interestingly, as expanding holding companies are more likely to provide assistance their

troubled subsidiaries are less likely to remain troubled in the future. On the other hand, while completely owned subsidiaries are also more likely to receive assistance, there appears to be no effect on recovery from distress.

*Transition into distress*

If bank holding companies serve as a source of strength to their affiliates, one might expect that not only do distressed subsidiaries receive assistance more frequently than other banks, but the hazard into a distressed state might be lower a parent companies act preemptively. In addition, while the results above suggest that affiliated banks recovery more quickly from distress, this is less meaningful if at the same time they are more likely to become distressed. In order to investigate this phenomenon, I run regressions using as a dependent variable a dummy variable for future distress on the same set of regressors as in the above tables but for the sub-sample of healthy banks.

The coefficient in the first column of Table 4 indicates that affiliation reduces the probability of distress in one year for healthy banks by about 0.80 percentage points and in two years by 1.44 percentage points. As the average probability of distress in one or two years for healthy banks is 4.1 and 6.5 percentage points, respectively, these results indicate that affiliation has a moderate economic impact on bank behavior. The size of the holding company relative to the bank (LARGE) and the primary capital ratio of other banks in the holding company (CAPITAL) appear to have sensible effects in the third row of column 3 and the fifth row of column 5. While the effect of relative size is economically large, one percentage point of

primary capital only reduces the probability of future distress by about 0.20 percentage points.

The effect of being affiliated with an expanding holding company has a large effect in the fourth row of column 4, indicating that parent holding companies with plans for expansion appear to take preemptive action to prevent subsidiaries from becoming distressed. As with the recovery from distress above, the dummy indicating full ownership of the subsidiary by the parent reduces the benefits of affiliation. The coefficient in the last row of column 6 implies that while a partially owned bank has a transition into distress 1.5 percentage points less than an unaffiliated bank, a wholly owned bank has a transition into distress equal to 0.62 percentage points less than an unaffiliated bank.

*Robustness: differences-in-differences specifications*

One potential problem with the regressions above is that banks affiliated with multi-bank holding companies are somehow "better" than other banks in the sense that they would be able to raise more capital on their own in the event of distress even in absence of affiliation with a multi-bank holding company. While many of the interactions used in the table should help mitigate this problem, it is still possible that the best banks sort into large, strong, expanding holding companies. In order to set aside this selection problem, I construct a sub-sample of distressed banks that either (a) switched from not being part of a multi-bank holding company to being part of one over the sample period or (b) were never part of a multi-bank holding company over the sample period. I then re-estimate each specification above with bank fixed effects, implicitly identifying the coefficient on affiliation by the

difference between the probability of injection after the bank joins the holding company from the probability before the bank joins the holding company. The coefficient in the first row of the first column of Table 5 indicates that the measured effect of affiliation is actually larger with the fixed effects, suggesting that selection is not driving the results.

**2. Are the observed differences in behavior across affiliation with a multi-bank holding company driven by regulatory or market discipline?**

Given a link between affiliation with a holding company and bank behavior, one might wonder whether or not this is being driven by regulatory or market pressures. Since the source of strength doctrine was given backbone by the granting of cross-guarantee authority to the FDIC in 1989, one approach is simply to duplicate the analysis above using bank micro data before FIRREA was implemented. If the same correlation between affiliation and the frequency of injections into distressed banks exist before regulators required bank holding companies to assist troubled subsidiaries, it is unlikely that the regulation had much of an effect on bank behavior, implying that the benefit of affiliation is driven by market discipline.

The identification problem is to identify the counterfactual behavior of an affiliated bank in absence of the source of strength doctrine. A first-pass to this question might simply compare the behavior of distressed affiliates in the years before 1989 to the years after, but this strategy is threatened by the banking crisis which presumably affected the ability of distressed subsidiary banks to recover even in the absence of regulation. Since the simple time series difference confounds the effect of regulation with the effect of banking

conditions, it is necessary to devise a strategy that eliminates the latter effect on bank behavior. A natural control group for the ability of subsidiary banks to recover from distress might be stand-alone banks, where there is at most a fixed difference, measured before the implementation of the doctrine, between the ability of these two groups to recover from distress. On the other hand, the difference in the ability of these two groups to recover after the implementation of policy includes the fixed difference in the absence of policy as well as the effect of policy on subsidiary banks. It follows that a double difference across affiliation with a multi-bank holding company and over time will identify the effect of regulation on the ability of affiliated banks to recover from distress as long as banking conditions did not have a differential affect across affiliation.

Focusing on the sub-sample of distressed banks, I implement a differences-in-differences estimator in Table 6, essentially comparing the behavior of affiliated banks relative to other banks before a formal source of strength policy to the behavior of affiliated banks relative to other banks after the policy change. The coefficients in line 1 of panel (a) of the first column indicates that distressed affiliated banks with multi-bank holding companies were more likely to receive an infusion of capital before FIRREA than distressed unaffiliated banks (columns 1 to 3). On the other hand, this did not add up to a statistically significant differential recovery rate from distress (columns 4 and 5). The coefficients in line 2 highlight the effect of regulation, increasing the probability of an injection of equity capital in column 3 and significantly decreasing the probability of future distress in columns 4 and 5. This result is reflected visually in Figure 1.

In contrast, consider the effect of regulation on non-distressed banks in panel (b). While these banks were no more likely to receive an injection of equity capital before FIRREA, they were less likely to become distressed in columns 4 and 5. There appear to be effects on the probability of an injection by the parent and on the probability of future distress in 2 years, but these effects are quite small relative to the effects in panel (a). Comparing the coefficients in panel (a) to those in panel (b), FIRREA had a much more significant effect on the behavior of distressed subsidiary banks.

## IV. Conclusions

In contrast to the historical experience before FIRREA, bank holding companies now appear to be a source of strength to their subsidiaries. Distressed affiliated banks are more likely to receive injections of capital than stand-alone banks, and recover from distress more quickly. Moreover, healthy affiliated banks are less likely to become distressed, as if the parent takes pre-emptive action to keep its subsidiaries out of trouble.

Interestingly, the effects of affiliation appear to be much stronger for an expanding bank holding company. While it is not possible to figure out whether this behavior is driven by an attempt to look well-behaved for either bank regulators or the market, it suggests that there is scope for regulators to do more in asking a parent to support a distressed subsidiary. In particular, why can't a bank holding company with the same size and strength as one with expansion plans do as much to help out a distressed subsidiary. It is possible that the deregulation of branching over the 1990s and subsequent wave of mergers has been an important check on bank holding company behavior, and that behavior will change once

opportunities for expansion are exhausted. An important caveat to this point, however, is that expanding bank holding companies are stronger in unobserved ways (i.e. beyond size, loan performance, capital, etc.) than non-expanding bank holding companies, so that this result is driven by an omitted variable. In any case, these issues seem to deserve careful study.

The analysis also highlights that the effects of affiliation are weaker for a holding company with only partial ownership of a subsidiary. While partial ownership is more the exception than the rule, it does raise the question of whether or not it is desirable. It is possible that without partial ownership many banks that are part of multi-bank holding companies would be stand-alone banks without a source of strength. Given that the cross-guarantee does not take into account the percentage of ownership of the parent, this fact does again beg the question of why an organization with the same size and strength as one with full ownership cannot do as much to help out a distressed subsidiary.

Finally, the benefits of affiliation for distressed subsidiaries seem to be largely driven by regulation. While there is some evidence that affiliated banks were more likely to receive an injection of capital than stand-alone banks before FIRREA, this did not translate into a faster rate of recovery from distress. It follows that the granting of cross-guarantee authority to the FDIC gave enough backbone to the source-of-strength doctrine to have a significant effect on bank holding company behavior.

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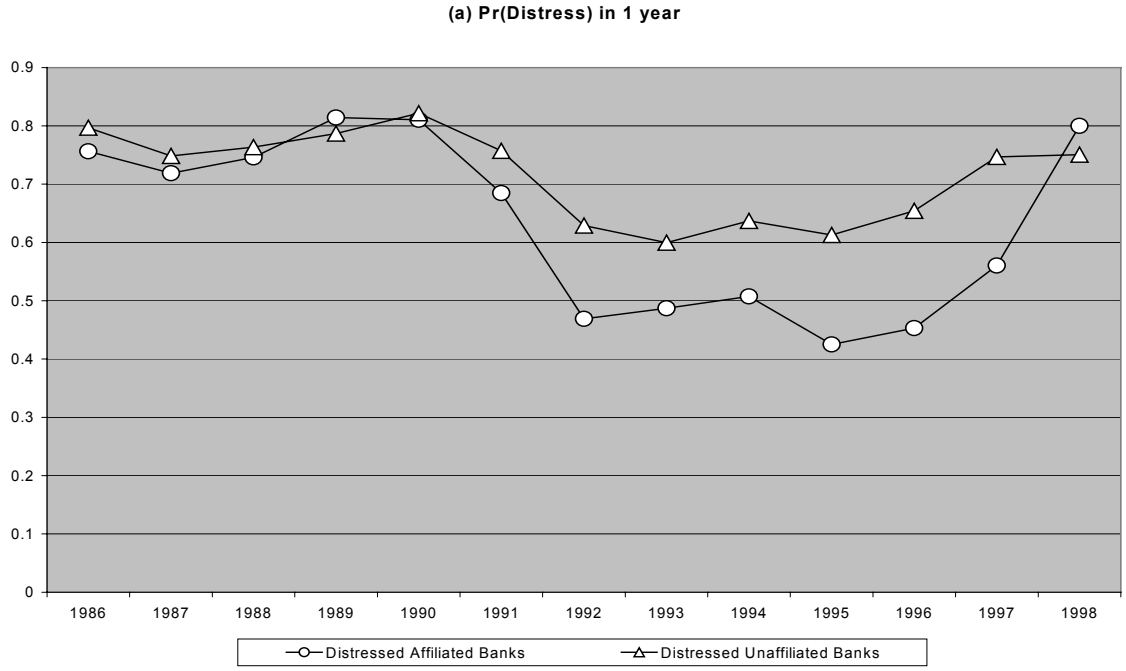
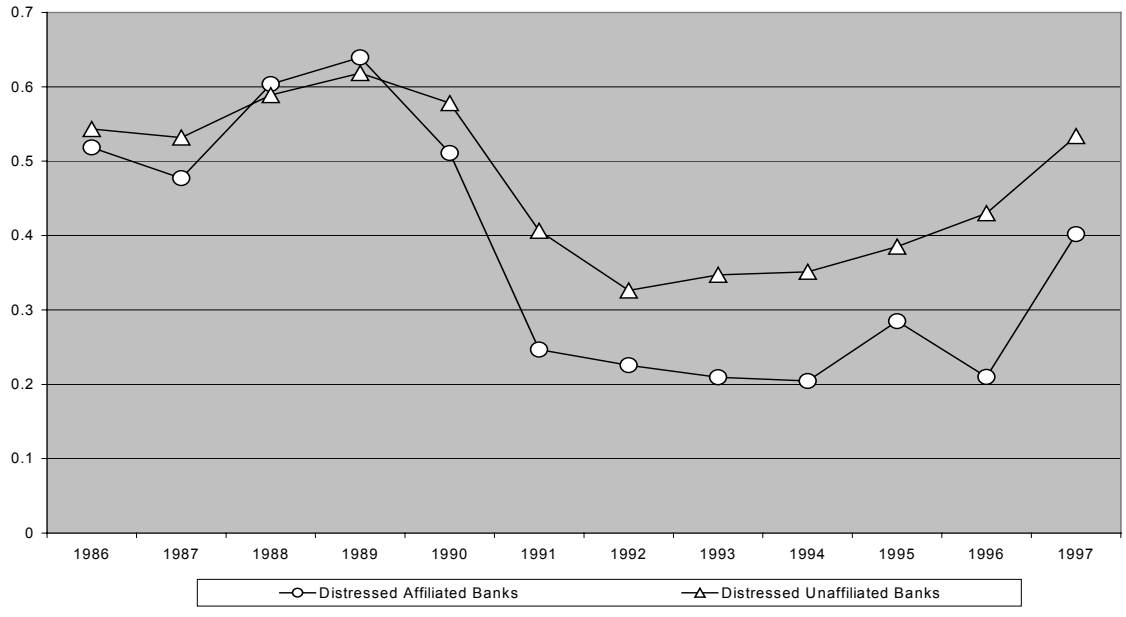
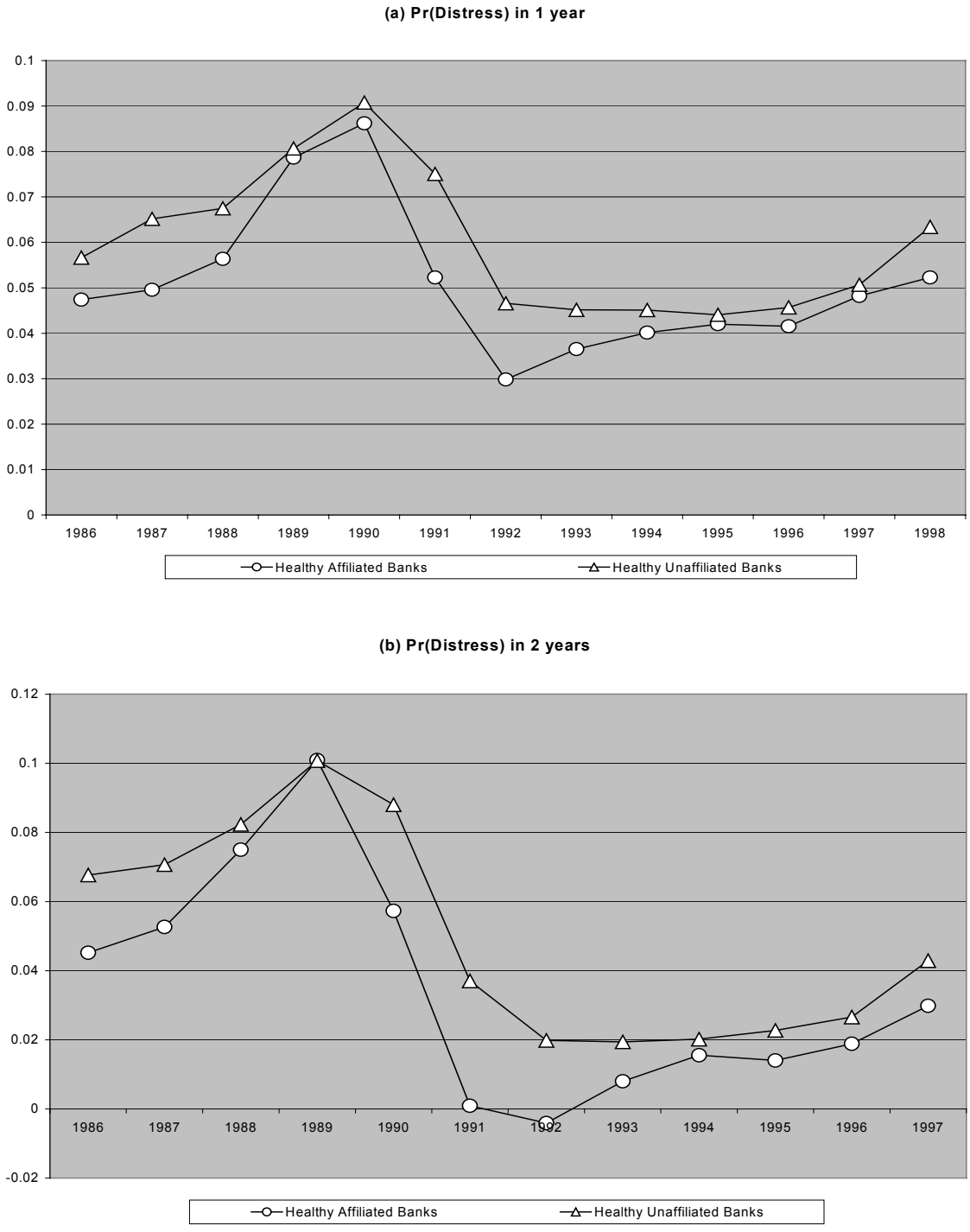
## Figure 1: Recovery from Financial Distress



## Figure 2: Transition into Financial Distress



## Table 1: Summary Statistics

| | Full | MBHC = 0 | MBHC = 1 | BAD = 0 | BAD = 1 |
|---|---|---|---|---|---|
| **A. Variables referring to the current condition of the bank** | | | | | |
| 1. MBHC | 0.3077 | 0 | 1 | 0.3242 | 0.2192 |
| | (0.4615) | (0.0000) | (0.0000) | (0.4681) | (0.4137) |
| 2. Ln(assets) | 11.056 | 10.8257 | 11.5743 | 11.1126 | 10.7543 |
| | (1.2714) | (1.0627) | (1.5248) | (1.2655) | (1.2605) |
| 3. Equity/Assets | 0.0924 | 0.0958 | 0.0846 | 0.0964 | 0.0711 |
| | (0.0371) | (0.0388) | (0.0317) | (0.0357) | (0.0373) |
| 4. Large CDs/Assets | 0.1253 | 0.1264 | 0.1227 | 0.1330 | 0.0844 |
| | (0.1262) | (0.1273) | (0.1237) | (0.1255) | (0.1222) |
| 5. OREO/Assets | 0.0047 | 0.0051 | 0.0037 | 0.0024 | 0.0168 |
| | (0.0120) | (0.0127) | (0.0102) | (0.0055) | (0.0239) |
| 6. Non-perfoming Loans/Loans | 0.0357 | 0.0373 | 0.0321 | 0.0288 | 0.0725 |
| | (0.0362) | (0.0373) | (0.0333) | (0.0254) | (0.0571) |
| 7. Bad CAMEL rating | 0.1578 | 0.1779 | 0.1124 | 0 | 1 |
| | (0.3645) | (0.3825) | (0.3158) | (0.0000) | (0.0000) |
| **B. Variables referring to affiliated banks** | | | | | |
| 8. MBHC*Distressed | 0.0516 | 0 | 0.1679 | 0.0338 | 0.1469 |
| | (0.2213) | (0.0000) | (0.3737) | (0.1807) | (0.3540) |
| 9. MBHC*Large | 0.1279 | 0 | 0.4156 | 0.1364 | 0.0823 |
| | (0.3339) | (0.0000) | (0.4928) | (0.3432) | (0.2748) |
| 10. MBHC*Capital | 0.0250 | 0 | 0.0812 | 0.0268 | 0.0151 |
| | (0.0397) | (0.0000) | (0.0235) | (0.0407) | (0.0317) |
| 11. MBHC*Acquisition | 0.0985 | 0 | 0.3201 | 0.1086 | 0.0445 |
| | (0.2980) | (0.0000) | (0.4665) | (0.3111) | (0.2061) |
| 12. MBHC*Ownership | 0.2482 | 0 | 0.8067 | 0.2632 | 0.168 |
| | (0.4319) | (0.0000) | (0.3949) | (0.4404) | (0.3739) |
| **C. Variables referring to future performance of the bank** | | | | | |
| 13. Pr(Bad CAMEL in 1 year) | 0.1476 | 0.1648 | 0.1060 | 0.0415 | 0.7105 |
| | (0.3547) | (0.3710) | (0.3078) | (0.1994) | (0.4535) |
| 14. Pr(Bad CAMEL in 2 years) | 0.1362 | 0.1503 | 0.1000 | 0.0653 | 0.5015 |
| | (0.3430) | (0.3573) | (0.3000) | (0.2470) | (0.5000) |
| 15. Pr(Injection of equity capital) | 0.1204 | 0.1122 | 0.1388 | 0.105 | 0.2028 |
| | (0.3254) | (0.3157) | (0.3457) | (0.3065) | (0.4021) |
| 16. Pr(Net sale of stock) | 0.0631 | 0.0756 | 0.0348 | 0.0549 | 0.1067 |
| | (0.2431) | (0.2644) | (0.1832) | (0.2277) | (0.3088) |
| 17. Pr(Injection by parent) | 0.0614 | 0.0393 | 0.1111 | 0.0538 | 0.1021 |
| | (0.2401) | (0.1943) | (0.3143) | (0.2256) | (0.3028) |
| Observations | 138,993 | 96,230 | 42,763 | 117,063 | 21,930 |

*Table notes:* the data refers to annual (December) observations on all commercial banks with CAMEL ratings 1986-1999.

## Table 2: Capital injections into banks with bad CAMEL ratings

| **A. Dependent variable: Pr(injection over the last year)** | | | | | | Dependent mean: 0.2025 | |
|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| 1. MBHC | 0.0823* | 0.0616* | 0.0413* | 0.0570* | 0.0845* | 0.0485* | -0.0277 |
| | (0.0073) | (0.0114) | (0.0083) | (0.0078) | (0.0158) | (0.0125) | (0.0245) |
| 2. MBHC*Distressed | | 0.0320* | | | | | 0.0189 |
| | | (0.0135) | | | | | (0.0146) |
| 3. MBHC*Large | | | 0.1128* | | | | 0.0899* |
| | | | (0.0135) | | | | (0.0151) |
| 4. MBHC*Acquisition | | | | 0.1279* | | | 0.1015* |
| | | | | (0.0169) | | | (0.0179) |
| 5. MBHC*Capital | | | | | -0.0316 | | 0.3820* |
| | | | | | (0.1963) | | (0.2206) |
| 6. MBHC*Ownership | | | | | | 0.0452* | 0.0244* |
| | | | | | | (0.0143) | (0.0145) |
| **B. Dependent variable: Pr(net sale of stock)** | | | | | | Dependent mean: 0.1064 | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| 7. MBHC | -0.0744* | -0.0576* | -0.0654* | -0.0819* | -0.1027* | -0.0288* | -0.0362* |
| | (0.0044) | (0.0068) | (0.0051) | (0.0043) | (0.0089) | (0.0086) | (0.0142) |
| 8. MBHC*Distressed | | -0.0261* | | | | | -0.0098 |
| | | (0.0073) | | | | | (0.0078) |
| 9. MBHC*Large | | | -0.0250* | | | | -0.0208* |
| | | | (0.0061) | | | | (0.0069) |
| 10. MBHC*Acquisition | | | | 0.0377* | | | 0.0448* |
| | | | | (0.0093) | | | (0.0096) |
| 11. MBHC*Capital | | | | | 0.4024* | | 0.1360 |
| | | | | | (0.1143) | | (0.1199) |
| 12. MBHC*Ownership | | | | | | -0.0609* | -0.0570* |
| | | | | | | (0.0088) | (0.0089) |
| **C. Dependent variable: Pr(equity injection by parent)** | | | | | | Dependent mean: 0.1018 | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| 13. MBHC | 0.1607* | 0.1251* | 0.1095* | 0.1404* | 0.1901* | 0.0809* | 0.0117 |
| | (0.0066) | (0.0103) | (0.0073) | (0.0070) | (0.0141) | (0.0105) | (0.0212) |
| 14. MBHC*Distressed | | 0.0551* | | | | | 0.0259* |
| | | (0.0126) | | | | | (0.0136) |
| 15. MBHC*Large | | | 0.1410* | | | | 0.1125* |
| | | | (0.0131) | | | | (0.0145) |
| 16. MBHC*Acquisition | | | | 0.1026* | | | 0.0682* |
| | | | | (0.0162) | | | (0.0169) |
| 17. MBHC*Capital | | | | | -0.4185* | | 0.2430 |
| | | | | | (0.1712) | | (0.1877) |
| 18. MBHC*Ownership | | | | | | 0.1065* | 0.0812* |
| | | | | | | (0.0127) | (0.0129) |
| Observations | 21,922 | 21,922 | 21,922 | 21,922 | 21,922 | 21,922 | 21,922 |

*Table notes*: the sample includes December data on all insured commercial banks with a most recent CAMEL rating of 3, 4, or 5 over 1986-1999. The table reports coefficients and standard errors (which have been corrected for heteroskedasticity) from a regression of each dependent variable on a dummy for affiliation with a multi-bank holding company, a set of bank-level controls, interaction of bank characteristics with affiliation, and a full set of year effects.

## Table 3: Recovery from a bad CAMEL rating

**A. Dependent Variable: Pr(bad CAMEL rating in 1 year)**
Dependent Mean: 0.7105

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| 1. MBHC | -0.0491* | -0.1115* | -0.0403* | -0.0318* | 0.0215 | -0.0479* | -0.0449 |
| | (0.0079) | (0.0128) | (0.0091) | (0.0084) | (0.0243) | (0.0140) | (0.0336) |
| 2. MBHC*Distressed | | 0.0992* | | | | | 0.1004* |
| | | (0.0146) | | | | | (0.0162) |
| 3. MBHC*Large | | | -0.0267* | | | | -0.0481* |
| | | | (0.0140) | | | | (0.0152) |
| 4. MBHC*Acquisition | | | | -0.0865* | | | -0.0644* |
| | | | | (0.0170) | | | (0.0178) |
| 5. MBHC*Capital | | | | | -0.9721* | | -0.5193 |
| | | | | | (0.3297) | | (0.3368) |
| 6. MBHC*Ownership | | | | | | -0.0017 | -0.0013 |
| | | | | | | (0.0156) | (0.0157) |
| Observations | 19,638 | 19,638 | 19,638 | 19,638 | 19,638 | 19,638 | 19,638 |
| R-squared | 0.174 | 0.176 | 0.174 | 0.175 | 0.174 | 0.174 | 0.177 |

**B. Dependent Variable: Pr(bad CAMEL rating in 2 years)**
Dependent Mean: 0.5015

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| 7. MBHC | -0.0610* | -0.1172* | -0.0443* | -0.0459* | 0.0215 | -0.0654* | -0.0329 |
| | (0.0088) | (0.0127) | (0.0100) | (0.0096) | (0.0241) | (0.0151) | (0.0322) |
| 8. MBHC*Distressed | | 0.0915* | | | | | 0.0989* |
| | | (0.0153) | | | | | (0.0167) |
| 9. MBHC*Large | | | -0.0536* | | | | -0.0851* |
| | | | (0.0156) | | | | (0.0173) |
| 10 MBHC*Acquisition | | | | | | | |
| | | | | -0.0760* | | | -0.0442* |
| | | | | (0.0172) | | | (0.0183) |
| 11. MBHC*Capital | | | | | -1.1267* | | -0.8431* |
| | | | | | (0.3077) | | (0.3146) |
| 12. MBHC*Ownership | | | | | | 0.0062 | 0.0115 |
| | | | | | | (0.0169) | (0.0170) |
| Observations | 17,839 | 17,839 | 17,839 | 17,839 | 17,839 | 17,839 | 17,839 |
| R-squared | 0.221 | 0.223 | 0.222 | 0.222 | 0.222 | 0.221 | 0.224 |

*Table notes*: the sample includes December data on all insured commercial banks with a most recent CAMEL rating of 3, 4, or 5 over 1986-1999. The table reports coefficients and standard errors (which have been corrected for heteroskedasticity) from a regression of each dependent variable (a dummy for bad CAMEL rating in 1 or 2 years) on a dummy for affiliation with a multi-bank holding company, a set of bank-level controls, and a full set of year effects.

## Table 4: Transition into a bad CAMEL rating

**A. Dependent Variable: Pr(bad CAMEL rating in 1 year)**
Dependent mean: 0.0415

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| 1. MBHC | -0.0082* | -0.0100* | -0.0054* | -0.0054* | 0.0085 | -0.0151* | 0.0079 |
| | (0.0013) | (0.0013) | (0.0016) | (0.0015) | (0.0055) | (0.0022) | (0.0063) |
| 2. MBHC*Distressed | | 0.0186* | | | | | 0.0223* |
| | | (0.0046) | | | | | (0.0047) |
| 3. MBHC*Large | | | -0.0072* | | | | -0.0132* |
| | | | (0.0020) | | | | (0.0022) |
| 4. MBHC*Acquisition | | | | -0.0092* | | | -0.0082* |
| | | | | (0.0019) | | | (0.0020) |
| 5. MBHC*Capital | | | | | -0.1982* | | -0.2205* |
| | | | | | (0.0600) | | (0.0629) |
| 6. MBHC*Ownership | | | | | | 0.0088* | 0.0101* |
| | | | | | | (0.0024) | (0.0024) |
| Observations | 104,167 | 104,167 | 104,167 | 104,167 | 104,167 | 104,167 | 104,167 |
| R-squared | 0.086 | 0.086 | 0.086 | 0.086 | 0.086 | 0.086 | 0.087 |

**B. Dependent Variable: Pr(bad CAMEL rating in 2 years)**
Dependent mean: 0.0653

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| MBHC | -0.0144* | -0.0158* | -0.0088* | -0.0120* | 0.0084 | -0.0218* | 0.0148* |
| | (0.0017) | (0.0017) | (0.0020) | (0.0020) | (0.0074) | (0.0029) | (0.0087) |
| 7. MBHC*Distressed | | 0.0141* | | | | | 0.0208* |
| | | (0.0056) | | | | | (0.0057) |
| 8. MBHC*Large | | | -0.0153* | | | | -0.0242* |
| | | | (0.0027) | | | | (0.0030) |
| 9. MBHC*Acquisition | | | | -0.0081* | | | -0.0049* |
| | | | | (0.0027) | | | (0.0029) |
| 10. MBHC*Capital | | | | | -0.2716* | | -0.3595* |
| | | | | | (0.0817) | | (0.0880) |
| 11. MBHC*Ownership | | | | | | 0.0096* | 0.0121* |
| | | | | | | (0.0032) | (0.0032) |
| Observations | 91,863 | 91,863 | 91,863 | 91,863 | 91,863 | 91,863 | 91,863 |
| R-squared | 0.104 | 0.104 | 0.104 | 0.104 | 0.104 | 0.104 | 0.104 |

*Table notes*: the sample includes December data on all insured commercial banks with a most recent CAMEL rating of 1 or 2 over 1986-1999. The table reports coefficients and standard errors (which have been corrected for heteroskedasticity) from a regression of each dependent variable (a dummy for bad CAMEL rating in 1 or 2 years) on a dummy for affiliation with a multi-bank holding company, a set of bank-level controls, and a full set of year effects.

## Table 5: Differences-in-Differences Specifications

| | Injection of Equity | Net Sale of Stock | Injection of Equity by BHC | Bad CAMEL in 1 year | Bad CAMEL in 2 years | Bad CAMEL in 1 year | Bad CAMEL in 2 years |
|---|---|---|---|---|---|---|---|
| 1. MBHC | 0.1440* | -0.0134 | 0.1623* | -0.0951* | -0.0852* | -0.0093* | -0.0014 |
| | (0.0368) | (0.0281) | (0.0288) | (0.0415) | (0.0411) | (0.0040) | (0.0050) |
| 2. Bad CAMEL | Yes | Yes | Yes | Yes | Yes | No | No |
| 3. Dependent mean | 0.1146 | 0.0467 | 0.0726 | 0.7105 | 0.5015 | 0.0415 | 0.0653 |
| 4. Observations | 4,890 | 4,890 | 4,890 | 4,463 | 4,128 | 27,903 | 24,517 |
| 5. R-squared | 0.477 | 0.411 | 0.538 | 0.501 | 0.62 | 0.27 | 0.393 |

*Table notes*: the sample includes December data on a subset of all insured commercial banks over 1986-1999. In particular, the sample includes banks that either become part of a multi-bank holding company over the sample or are never part of one during the sample. The first five columns refer to banks with CAMEL ratings of 3, 4, or 5 while the last two columns refer to banks with CAMEL ratings of 1 or 2. The table reports coefficients and standard errors (which have been corrected for heteroskedasticity) from a regression of a dummy for a capital injection in the last year on a dummy for affiliation with a multi-bank holding company, a set of bank-level controls, interaction of bank characteristics with affiliation, and a full set of year and bank fixed effects.

## Table 6: The Effect of Regulation on Behavior

**A. Distressed Banks**

| | Injection of Equity | Net Sale of Stock | Injection of Equity by BHC | Bad CAMEL in 1 year | Bad CAMEL in 2 years |
|---|---|---|---|---|---|
| 1. MBHC | 0.0755* | -0.0637* | 0.1426* | -0.0149 | -0.0113 |
| | (0.0100) | (0.0058) | (0.0090) | (0.0102) | (0.0123) |
| 2. MBHC*SOS | 0.0148 | -0.0197* | 0.0358* | -0.0720* | -0.1061* |
| | (0.0140) | (0.0080) | (0.0127) | (0.0149) | (0.0164) |
| 3. Dependent mean | 0.2028 | 0.1067 | 0.1018 | 0.7105 | 0.5014 |
| 4. Observations | 21,930 | 21,930 | 21,922 | 19,643 | 17,841 |
| 5. R-squared | 0.05 | 0.043 | 0.081 | 0.169 | 0.218 |

**B. Non-Distressed Banks**

| | Injection of Equity | Net Sale of Stock | Injection of Equity by BHC | Bad CAMEL in 1 year | Bad CAMEL in 2 years |
|---|---|---|---|---|---|
| 6. MBHC | -0.0042 | -0.0389* | 0.0338* | -0.0090* | -0.0094* |
| | (0.0038) | (0.0025) | (0.0031) | (0.0031) | (0.0041) |
| 7. MBHC*SOS | 0.0027 | -0.0010 | 0.0066* | 0.0003 | -0.0079* |
| | (0.0043) | (0.0028) | (0.0035) | (0.0033) | (0.0043) |
| 8. Dependent mean | 0.1050 | 0.0549 | 0.0546 | 0.0415 | 0.0653 |
| 9. Observations | 117,063 | 117,063 | 117,051 | 104,173 | 91,868 |
| 10. R-squared | 0.059 | 0.042 | 0.050 | 0.085 | 0.103 |

*Table notes:* The data includes annual (December) data on commercial banks matched to supervisory ratings 1986-1999. The table reports coefficients and standard errors from a differences-in-differences regression of each dependent variable in columns (1) through (5) on bank-level controls, a dummy variable indicating affiliation with a bank holding company (MBHC), the interaction of affiliation with a dummy indicating the enactment of FIRREA (SOS), and a full set of year fixed effects. Standard errors have been corrected for heteroskedasticity and are clustered at the bank level.