

**Impact of Independent Directors and the  
Regulatory Environment on Merger  
Prices and Motivation: Evidence from  
Large Bank Mergers in the 1990s**

Elijah Brewer III

William E. Jackson III

Julapa A. Jagtiani

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## **Elijah Brewer III**

*Research Department, Federal Reserve Bank of Chicago  
230 S. LaSalle Street, Chicago, IL 60604-1413  
Tel (312) 322-5813, Fax (312) 322-5214  
E-mail: [ebrewer@frbchi.org](mailto:ebrewer@frbchi.org)*

## **William E. Jackson III**

*Kenan-Flagler Business School, McColl Building  
University of North Carolina, Campus Box 3490  
Chapel Hill, NC 27599-3490  
Tel (919) 962-3214, Fax (919) 962-2068  
E-mail: [WEJ3@unc.edu](mailto:WEJ3@unc.edu)*

## **Julapa A. Jagtiani**

*Supervision and Regulation, Federal Reserve Bank of Chicago  
230 S. LaSalle Street, Chicago, Illinois 60604-1413  
Tel (312) 322-5798, Fax (312) 322-5894  
E-mail: [Julapa.A.Jagtiani@chi.frb.org](mailto:Julapa.A.Jagtiani@chi.frb.org)*

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## I. Introduction and summary

The last decade has witnessed an unprecedented pace of bank mergers and acquisitions. Between 1990 and 1998, the number of bank mergers and acquisitions averaged about 510 per year compared to 345 per year over the 1980-1989 period. As a result, the number of banks operating in the U.S. has declined by approximately 30 percent since 1990. Our investigation of the factors that determine market prices for bank mergers will likely advance our understanding of the likely directions and consequences of continuing mergers and acquisitions in the banking industry. In this article, we focus on an important question which remained unanswered in the literature -- how the *composition of the boards of directors* and the *regulatory environment* influence the takeover market and bank merger prices.

Several authors have suggested that corporate boards can be an important internal governance mechanism for protecting shareholders' interests [see Fama (1980) and Fama and Jensen (1983)]. Specifically, independent outside directors are thought to represent the interests of shareholders because they help to mitigate shareholder/management agency problems. Independent outside directors could potentially play an important monitoring role in merger transactions. If independent outside directors are more likely to make decisions consistent with shareholder-wealth maximization, then merger prices may be expected to be higher for targets with a greater proportion of outside directors

than for other targets.<sup>1</sup> Cotter, Shivdasani, and Zenner (1977) find that, for *non-financial* firms that are the targets of tender offers, the initial tender offer premium (bid premium revision) and target shareholder gains are higher when the target's board is independent. Board independence is defined as having more than 50 percent independent directors. We examine the impact of independent outside directors on the bid premium for bank mergers.

Corporate governance literature also identifies factors other than board independence that may be important to effectiveness of the board of directors in negotiating bank acquisitions -- 1) board size; and 2) equity ownership by inside directors or managers. Yermack (1996) found an inverse relationship between firm value and board size, suggesting that smaller boards may be more effective decision-makers and thus enhance firm value. However, his sample omitted banks and other financial firms. The finance literature suggests that the share ownership by managers (and other inside directors) may be an important determinant of merger market efficiency [see Mikkelson and Partch (1989) and Cotter and Zenner (1994)]. Higher share ownership by insiders should lead to larger bid premium and, thus, larger gains to insiders from a merger offer. We examine the importance of these factors for bank mergers.

In addition to board composition, we examine factors that affect supply and demand conditions in bank merger markets, which have been changing rapidly and may have been driving bank merger waves in the 1990s. First, bank mergers may be driven by desires to reduce overall risk by diversifying into new geographic or products markets. Benston, Hunter, and Wall (1995) label this motivation as the "*earnings diversification*"

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<sup>1</sup> For acquiring banks, Subrahmanyam, Rangan, and Rosenstein (1997) find that abnormal returns are negatively correlated with the proportion of outside directors.

*hypothesis*. An acquirer may seek earnings diversification in an effort to generate higher levels of cash flow for the same levels of total risk. According to the earning diversification hypothesis, an acquiring bank will pay more for a target that offers an opportunity to diversify its earnings.

Second, bank mergers may be motivated by a strategic decision to attempt to exploit economies of scale, or to cut overhead and eliminate duplication by closing branches, or to achieve synergies through economies of scope. More importantly, bank mergers may be an attempt by banks to increase their market power, or to quickly grow into super-regional or money center banks, and to become "too-big-to-fail" (TBTF). It is suspected that TBTF may have been one of the reasons for the rise in megamergers in the 1990s [see Kane (2000)]. Benston, Hunter, and Wall (1995) refer to this as the "*deposit insurance put-option-enhancing*" hypothesis. According to this hypothesis, acquirers are expected to be willing to pay more for riskier organizations, with greater up-side gains, and whose returns are more correlated with the acquirer's returns.

Our test of this hypothesis provides an important policy implication, particularly since previous research has documented the possibility that banking organizations may seek to become larger to increase their federal safety net protection (i.e., to increase the probability that the FDIC will cover 100 percent of their liabilities).<sup>2</sup> While most of the mergers between large publicly traded banks in the early and mid-1980s were not due to attempts to exploit deposit insurance, the TBTF consideration may have been important

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<sup>2</sup> The Federal Deposit Insurance Corporation Improvement Act (FDICIA) of 1991 introduced mandatory procedures called prompt corrective actions (PCA) which require regulators to promptly close depository institutions when their capital falls below pre-determined quantitative standards, thus, eliminating the possibility of regulators providing special consideration to large

in megamergers of the 1990s [Benston, Hunter, and Wall (1995), Hunter and Wall (1989), and Boyd and Graham (1991)].<sup>3</sup> In this article, we examine the distinguishing characteristics of mergers among large banking organizations to identify any TBTF attempts in these megamergers.

To some extent, each of the merger motivations, and resultant strategies, became more feasible in the 1990s as the relaxing of state and federal restrictions expanded the set of merger opportunities for the banking industry. The Riegle-Neal Interstate Banking and Branching Efficiency Act of 1994 allows banks to branch interstate by consolidating existing out-of-state bank subsidiaries, or by acquiring banks or individual branches of banks through mergers and acquisitions. Prior to the Riegle-Neal Act banks were restricted by federal and state laws from expanding across state lines (with some exceptions).<sup>4</sup> After Riegle-Neal, banks have full freedom to acquire out-of-state banks in order to diversify geographically.<sup>5</sup>

On the one hand, it is arguable that merger prices should increase as restrictions on expansion are reduced. Prior to the Riegle-Neal, the number of potential bidders for a given target bank was limited by laws governing intrastate and interstate acquisitions. The removal of these restrictions should increase the demand for target banks as the

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banks because of the possible systemic impact of large bank failure. Therefore, the notion of "TBTF" may be expected to be less relevant since FDICIA.

<sup>3</sup> Siems (1996) examines bank megamerger deals in 1990-1995, and concludes that market powers are not the primary motivation for the mergers.

<sup>4</sup> The Riegle-Neal Act allows bank holding companies to acquire banks in any state after September 29, 1995, and allows mergers between banks located in different states beginning June 1, 1997 (unless states individually opt out of this branching authority or choose to adopt an earlier starting date).

<sup>5</sup> On November 12, 1999, President Clinton signed into law the Financial Services Modernization Act (Gramm-Leach-Bliley Act of 1999) allowing the merger of banks with securities firms and insurance companies within financial holding companies. This will further expand the merger opportunities for banking organizations and may lead to a new wave of consolidation in banking as well as in other sectors of the financial services industry.

number of potential bidders increases, resulting in higher acquisition prices observed in the post-Riegle-Neal environment. And, increased prices would tend to make bank owners more willing to sell. Merger prices may have played an important role in the rise in bank mergers in the last decade.

On the other hand, merger prices could also be lower when restrictions are removed. Geographic expansion restrictions form a barrier to entry that provides a bank with a protected niche and permits it to earn excess profits. These excess profits become part of the price in merger negotiations. Decreasing the barriers to entry reduces the excess profits and thereby lowers merger prices. By insuring that they earn only normal profits, lowering the barriers to entry may increase substitutability among target banks, enlarging -- from the acquirer's perspective -- the effective supply of alternatives. Under the barriers to entry hypothesis, lower prices should be observed in the post-Riegle-Neal environment.

We examine changes in merger prices over time, and particularly in the post-Riegle-Neal environment. The merger bid premiums offered for a target bank by the acquiring bank are the "prices" commonly used by both regulators and analysts. We define the merger bid premiums in two ways. First, we define the bid premium as the ratio of the market price offered for the target to book value of equity of the target bank. Second, the bid premium is defined as the ratio of the market price offered for the target to market value of equity (around four weeks prior to the merger announcement date) of the target.<sup>6</sup>

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<sup>6</sup> The results using this definition of the bid premiums are not presented in this version of the paper.

In addition to examining how the bank merger prices have changed over the 1990s, we determine how the merger bid premiums are correlated with the financial characteristics of the target and the acquiring banks, the board of director composition, and the regulatory environment. Like any investment, the value of the target bank to the acquiring bank should reflect its present discounted value of future net cash flows. At a minimum, the bid price offered by the acquiring bank should reflect the stand-alone value of the net assets of the target bank and the net cash flows from higher-valued deposit insurance as a result of the proposed merger. If acquirers seek to exploit diversification gains, then the risk of the target should be inversely related to the bid price. On the other hand, if acquirers seek to exploit the deposit insurance put-option, then the risk of the target should be positively related to the bid price. In addition, risky acquirers may bid more than low-risk acquirers for targets because the value of becoming TBTF is greater for large banks that are more likely to fail.

We find a variety of interesting and important results. We find that better performing targets, as measured by return on assets, are offered higher bids, and that a target's volatility of returns is negatively correlated with the bid premiums. The price for target banks tends to be larger during the post-Riegle-Neal period, possibly because of the increase in the actual or potential number of bidders. Because Riegle-Neal provides increased interstate branching and banking opportunities for banking organizations, the demand for targets should increase as the universe of bidders increases, resulting in higher acquisition prices. In addition, the proportion of independent outside directors is positively related to the bid premiums, while insider ownership is negatively related to bid premiums. We find board size to be unimportant.



To get a better sense of how the bid prices might depend on the acquirer's ability to reduce the costs of producing the combined organization's existing product mix by achieving economies of scale, we use the relative asset ratio,  $TA_T/TA_A$ , where  $TA$  is total asset size and the subscript identifies the target ( $T$ ) or acquiring ( $A$ ) banks. If a larger relative asset ratio provides a greater opportunity for merger-related efficiencies to be realized, then the relative asset ratio should be positively correlated with bid prices.

A countervailing factor in large bank mergers, however, is the difficulty of merging two large sized banking organizations, or two organizations of equal size. According to organization theorists, melding cultures in a merger is more difficult and costly when the target is more equal in size to the acquirer [see Benston, Hunter, and Wall (1995)]. If the short-run costs are positive function of size and these costs outweigh the value of having increased access to deposit insurance, then an inverse relationship between size and merger prices is expected. Our results suggest a significantly positive relationship between the bid premiums and the binary variable indicating relative asset ratio of target to acquiring bank being in the range of 5.92 percent to 35.43 percent.

Overall, our results suggest that changes in federal banking regulations have significant impact on bank merger activity in general, and bank merger prices in particular. Furthermore, by restricting the type of merger transactions that can take place, federal interstate banking laws may have had unintended consequences, causing bid premiums to be lower. But once these restrictions are removed with the passage of Riegle-Neal in 1994, bid premiums rose relative to the pre-Riegle-Neal period. Thus, our results show how given federal regulatory policies that restricts interstate branching and

banking may produce very different (and distorted) merger prices relative to policies that are less restrictive and market driven.

## II. Literature Review and Our Contribution

Previous studies on mergers and acquisitions of non-financial firms have produced mixed results about the determinants of merger premiums. It is even more complicated to identify the determinants of these premiums in the banking industry due to the scrutiny of governmental regulations and monitoring. In addition to characteristics of the deal, the target, and the acquiring banks, regulatory environments in both acquiring and target bank states tend to also affect the bid premiums [see Palia (1993)]. The analysis of bank merger premiums is further complicated by regulatory uncertainty [see Desai and Stover (1985)]. All bank mergers require time-consuming regulatory approval, making hostile takeover extremely difficult to execute.

In previous bank studies [Beatty, Santomero, and Smirlock (1987); Cheng, Gup, and Wall (1989); Fraser and Kolari (1988); Rogowski and Simonson (1989); Rose, (1991); and Brewer, Jackson, Jagtiani, and Nguyen (2000)], asset size, profitability, management, leverage, means of payment, and whether the mergers were interstate or intrastate have been found to be significant in determining the bid premiums or explaining the stock market reactions to announcements of bank mergers. The banking literature suggests that size is also important in determining the bid premiums offered to the target. Shawky, Kilb, and Staas (1996) find that smaller targets tend to be offered a larger bid premium, and Palia (1993) finds that the relative size of targets and acquiring banks are important in explaining the variation in the bid premiums. With regard to performance, Shawky, Kilb, and Staas (1996) and Brewer, Jackson, Jagtiani, and Nguyen

(2000) find that greater bid premiums tend to be offered to target banks with higher profitability.

Cornett and Tehranian (1992), examining the postmerger performance of large bank mergers between 1982 and 1987, find that merged banks tend to perform better than the banking industry. This superior performance resulted from improvement in the merged banks' ability to attract loans and deposits, improved employee productivity, and faster asset growth. For recent literature review on bank merger performance, see Berger, DeYoung, Genay, and Udell (2000).

It should be noted that our study of the bid premiums focuses on short-term phenomena. Cornett and Tehranian (1992) examine operating cash flows as well as several accounting variables of the merged banks during 1 to 3 years after the mergers. Recognizing that accounting data are not perfect measures of economic performance, they utilize both accounting and market data to determine whether stock price gains associated with mergers announcement (short-run) are the result of real economic gains (long-run). Interestingly, they find a significant correlation between announcement-period abnormal stock returns and the various long-term performance measures, and conclude that market participants are able to identify in advance the improved performance associated with bank acquisitions.<sup>7</sup> Unlike Cornett and Tehranian (1992), we focus on short-term performance, rather than testing whether mergers will result in efficiency gains or improved long-run performance.

Overall, the empirical results presented in the previous studies have been mixed and largely depend on the sample period, sample observations, and methodology. We re-

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<sup>7</sup> Healy, Palepu, and Ruback (1991) perform a similar study on non-regulated firms.

examine this issue using more recent and more complete data on bank mergers. Our results based on more recent data are more applicable to current policy issues than previous studies given the rapidly evolving environment that the banking industry is facing today. Furthermore, our study focuses on the impact of the important changes in the regulatory environment brought about by the Riegle-Neal Act, which have greatly affected the bid premiums offered by the acquiring banks and the overall merger and/or takeover decisions in the U.S. banking industry. In addition to investigating the importance of the Riegle-Neal on the bid price that the acquiring banks are willing to pay for the target banks, we also examine the important motivation for bank mergers in the pre- and post-Riegle-Neal periods. That is, banks may decide to merge in order to improve their portfolio diversification, to achieve economies of scale and/or economies of scope, or to exploit the deposit insurance put options or to become TBTF. The importance of the Riegle-Neal, together with board composition, on merger bid premiums has not been the focus of any of the previous studies.

### III. The Data

All bank mergers and acquisitions taken place from 1990 to mid-1998 and the detail about the merger deals are obtained from the Security Data Corporation (SDC). To be included in our sample, both the target and acquiring banks must be publicly traded.<sup>8</sup> Financial data is obtained from the quarterly Call Reports and Y-9 Reports, as of yearend prior to the merger announcement date. The merger announcement date, target name, acquirer name, value of the deal, bid premium, and other characteristics of the merger announcement come from the SDC database.

There are 327 bank merger deals during the period 1990 to mid-1998 that involved those banks whose shares are publicly traded in the secondary market. We eliminated thrift institutions because they have different powers than commercial banking organizations and entered the 1990s in worse financial distress than commercial banking firms.<sup>9</sup> Our initial commercial banking sample includes 288 institutions. We only used the 189 merger deals for which proxy statements were available to compute board composition and ownership structure. Of these 189 deals, 63 deals were announced prior to the Riegle-Neal, and 126 deals were announced in the post-Riegle-Neal period.

*a. Measures of board composition*

We classify directors into three groups: inside directors, gray directors, and independent outside directors. Inside directors are either present or past employees of the bank. Gray (affiliated, or non-independent) directors include family members of insiders and persons who have some business ties to the bank (attorneys whose firm represent the bank, consultants to the bank, etc.). Independent outside directors are directors who are

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<sup>8</sup> We are aware of the sample bias problem stemmed from this criterion, so the result may not be applicable to small banks.

<sup>9</sup> For firms in financial distress, directors, managers, and other stockholders have less influence on merger process than for other firms.

not current or past employees of the bank, do not have substantial business or family ties with management (as indicated in the proxy statement), nor have potential business ties with the bank.

Cotter, Shivdarsani, and Zenner (1997) define a board as independent when independent directors are more than fifty percent of the board membership. However, the average bank board tends to have substantially more than fifty percent independent outside directors. In addition, larger bank boards tend to have a large proportion of independent outside directors. We control for board size in our empirical specification to isolate the impact of independent outside directors on bid premiums. Yermack (1996) finds a positive correlation between the proportion of independent outside directors on the board and board size, and a negative correlation between board size and firm valuation. Following Yermack (1996), we measure board independence as simply the ratio of independent outside directors to the total number of directors on the board. This variable is labeled “Proportion of independent directors” in Table 3. The proportion of independent outside directors is expected to be positively correlated with bid premiums.

*b. Ownership Structure Variable*

Another corporate governance mechanism that is designed to align the interest of managerial and board interests with those of shareholders is share ownership by manager (inside directors) -- see Morck, Shleifer, and Vishny (1988). Brickley and James (1987), Allen and Cebenoyan (1991), and Carter and Stover (1991) find that share ownership by managers and directors is beneficial to shareholders of banks. Mikkelson and Partch (1989) and Cotter and Zenner (1994) show that, with greater share ownership, managerial gains from merger offer are larger and managerial resistance less likely. McConnell and

Servaes (1990) demonstrate that the proportion of share ownership by managers is important in determining firm value. We include a measure of insider ownership in our analysis -- measure the financial incentives of inside directors by using their percentage of equity ownership (owned by inside and gray directors) in the last proxy statement prior to the merger announcement.

*c. Interstate versus Intrastate*

Historically, restrictions on banks' ability to expand geographically have been among the primary determinants of the structure of commercial banking in the U.S [see Frieder (1988) and Cornett and De (1991a)]. Concerns about undue concentration of banking resources, and that banks might exercise their market power by setting high prices and restricting service, led to the imposition of restrictions at both the state and national levels. The McFadden Act of 1927 restricted nationally chartered banks' branching ability to the same extent allowed to state-chartered banks. The Bank Holding Company Act of 1956 prevented multibank holding companies (MBHCs) from acquiring existing banks or chartering new banks in states other than their home state. The Douglas Amendment of the 1956 Act allowed MBHCs to acquire banks only to the extent permitted by the laws of the state of the target bank. Even the Reigle-Neal Act limits the market share that a banking organization can hold nationwide or in any given state. The act established a 10 percent nationwide deposit concentration limit on organizations making interstate acquisitions and a uniform 30 percent statewide limit (unless a state chooses a different limit).<sup>10</sup>

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<sup>10</sup> The first state statutes permitting entry to out-of-state MBHCs in accordance with the Douglas Amendment were enacted in 1975 and 1982 by Maine and Alaska, respectively. By the late 1980s, 41 states and the District of Columbia had passed similar laws [see Amel (1986); Frieder (1988); and Cornett and De (1991a)]. Moreover, several states formed reciprocal regional

Palia (1993) and Shawky, Kilb, and Staas (1996) find that the bid premiums offered to target banks are larger for out-of-state mergers relative to those intrastate mergers. Similarly, Cornett and De (1991a) find significant positive announcement period abnormal returns for both target and acquiring banks in interstate bank mergers. However, Cornett, Hovakimian, Palia, and Tehranian (2000) find that interstate bank mergers earn significant negative announcement period abnormal returns, whereas intrastate mergers earn zero abnormal returns. We include in our empirical specification a binary variable, *Interstate*, to capture instate mergers relative to those that are out-of-state. *Interstate* equals 1 if the target and acquirer are located in the same state, and 0 otherwise.

*d. Variables Measuring Profitability and Risk of the Net Cash Flows*

As mentioned above, previous studies found that merger prices were related to the financial characteristics of both the target and acquirer. We measure the profitability of the target by using the return on assets (*ROA*) one-year before the merger announcement date. We expect the sign on *ROA* to be positive, as more profitable targets are more attractive. To measure the variables that capture earnings diversification possibilities and changes in the value of the deposit-insurance put option, we use the method in Benston, Hunter, and Wall (1995). We compute the variance of the return on assets of the target (acquirer),  $VAR_T$  ( $VAR_A$ ) and the covariance of the target's and acquirer's return on assets,  $COV_{AT}$ . If an acquirer seeks to diversify its earnings, then  $COV_{AT}$  and  $VAR_T$  should be negatively correlated with the bid premium. On the other hand, if banking

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banking pacts to allow banks in pact states to acquire targets in other pact states. For example, prior to the Reigle-Neal Act, Wisconsin regional reciprocal law allowed entry by acquisition for banking organizations from Illinois, Iowa, Indiana, Kentucky, Michigan, Minnesota, Missouri,



organizations seek to become larger to exploit deposit insurance, then  $COV_{AT}$  and  $VAR_T$  should be positively correlated with the bid premium. In addition,  $VAR_A$  should be positively correlated with the bid premium because risky acquirers are likely to bid more than low-risk ones for target banks, as the value of becoming TBTF is greater for banks that more likely to fail. We compute  $VAR_T$ ,  $VAR_A$ , and  $COV_{AT}$  using their respective return on assets over the thirteen quarters prior to the merger announcement date. We include indicator variables for the year of the merger announcement that ranges between 1990 and mid-1998. These variables are introduced to account for the effect of omitted macroeconomic and other variables that may influence the overall level of acquisition activity over time and thus, the merger premium paid for a given transaction.

A variable that measures size of each target banking organization relative to the size of acquirer,  $RELSIZE$ , is also included.  $RELSIZE$  may be either positively or negatively associated with the attractiveness of a given target. A positive coefficient for this variable would be consistent with the hypothesis that potential bidders look for significant targets that participate in significant markets. A negative coefficient, if found, may reflect the cost of melding the culture of a large target bank with that of the acquirer. In addition, the  $RELSIZE$  variable is also used to rank our sample into five groups with equal number of deals in each group -- with  $RELSIZE$  ratio being less than 5.92 percent, between 5.92 and 16.6 percent, between 16.6 and 35.4 percent, between 35.4 and 50.0 percent, and greater than 50 percent. We use binary variables to differentiate among four pre-specified  $RELSIZE$  groups, where the excluded group consists of those deals in which  $RELSIZE$  is greater than 50 percent ratio.

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and Ohio as long as those states allowed acquisitions by Wisconsin banks in their markets [see Saunders (1997)].

Summary statistics of the sample are presented in Table 1. From panel A, 189 deals are included in our analysis. The sample distribution by year is also presented. From panel B, average asset size of the sampled target and acquiring banks are \$8.2 billion and \$28.9 billion, respectively. The relative asset size of target to acquiring banks, on average, is approximately 28 percent. On average, the volatility of returns, as measured by the variance of returns on assets, is much greater for the target banks (0.28) than for the acquiring banks (0.18). For the entire sample period (1990 to mid-1998), the offer prices average to about 2.25 times the target's book value of equity.

#### IV. Multivariate analysis of bid premium

We estimate the following multivariate regression:

$$BVPREM_{j,t} = f(\text{board composition, ownership structure, target performance and risk variables, acquirer risk variables, Interstate binary variable}).$$

where *BVPREM* is the bid premium offered for the target.

Table 2 summarizes the expected signs of selected variables under the two competing hypotheses -- earnings diversification hypothesis vs deposit-insurance-put-option hypothesis.

From panel C of Table 1, the average bid premiums significantly increased as a result of the Riegle-Neal Act -- average at 1.8 times the target's book value of equity in the pre-Riegle-Neal period (1990-1993) compared to 2.5 times in the post-Riegle-Neal period (1995-1998). This is consistent with results reported in Table 3 -- the larger positive coefficients of 1996, 1997, and 1998 compared to those of earlier years. The changes in regulatory environment to grant U.S. banks with greater independence to merge, brought about by the Riegle-Neal Act, have significantly increased merger bid premiums. The acquiring banks have been more willing to pay a higher price for target

banks after the Riegle-Neal, probably because of the increased demand to acquire potential target banks as the universe of bidders increased.

The coefficients of target's return on assets are also significantly positive, as expected, suggesting that the acquiring banks are willing to pay a larger bid premium for those more profitable target banks. This is consistent with our earning diversification hypothesis as a motivation for bank mergers. The target's volatility of returns is negative and significant at the 1 or 5 percent level. The greater the volatility of returns, the more risky the target banks are. The acquiring banks are not willing to pay a high price for riskier target banks. Again, the results are consistent with the earning diversification hypothesis, but inconsistent with the deposit insurance exploitation hypothesis.

The significantly positive coefficient of the dummy variable indicating the relative target size to acquirer size between 5.92 percent and 35.43 percent is also consistent with the earning diversification hypothesis. The acquiring banks are willing to pay more for smaller target banks in this relative size range, probably because the target is large enough to have significant participation in the market but not too large so that it is difficult to culturally blend in smoothly with the acquirer.

All of the year dummies (except for 1992) are positive and significant at the 5 percent level or better, with coefficients tending to increase over the years. The results indicate that merger bid premiums offered by the acquiring bank have increased over the sample period 1990 to 1998, and particularly during the post-Riegle-Neal period.

The proportion of independent outside directors is positive and significant at the 1 percent level. The more independent the board of directors of the target bank, the higher the merger bid premium secured by the target bank, suggesting that more independent

boards created value for the shareholders of the target banks. This finding is also consistent with Cotter, Shivdasani, and Zenner (1997). The coefficient of board size, however, is not significant. Board size does not have a significant impact on merger bid premiums. Note that this may be a consequence of the regulatory and historical character of bank boards, since bank boards tend to be larger than those of non-financial firms.

Overall, our empirical results are consistent with the earnings diversification hypothesis. Benston, Hunter, and Wall (1995) find similar results for bank mergers in the December 1981 to July 1986 period. Interestingly, the prime motivation for bank mergers did not seem to be distorted by the interstate banking and branching restrictions. In addition, our results provide strong support for the value of independent boards in increasing the wealth of shareholders of target banks.

## V. Summary and Conclusions

The empirical evidence from this study is based on 187 bank merger deals during the period 1990 to mid-1998. We find that changes in the regulatory environment had a significant impact on bank merger activities in general, and bank merger prices in particular. The merger bid premiums significantly increased by approximately 35 percent on average from the pre- to the post-Riegle-Neal periods. The finding implies that the interstate banking and branching regulation did distort merger prices relative to those that would have been prevailing if there were less regulatory restrictions and more market driven business decisions allowed.

The empirical evidence overall support the earning-diversification hypothesis, rather than the deposit-insurance-put-option hypothesis, as a prime motivation for bank mergers. Our results, in conjunction with the literature, suggest that while the Riegle-

Neal Act had a significantly impact on bank merger bid premiums, it does not seem to have altered the motivation for mergers in the U.S. banking industry. Finally, our results provide strong support for the value of independent boards in increasing the wealth of shareholders of target banks.

## References

Allen, Linda and A. Sinan Cebenoyan, 1991, "Bank Acquisitions and Ownership Structure: Theory and Evidence," *Journal of banking and Finance*, Vol. 15, 425-448.

Adkisson, J.Amanda and Donald R. Fraser, 1990, "The effect of geographical deregulation on bank acquisition premium," *Journal of Financial Services Research*, Vol. 4, July, 145-155.

Baradwaj, Babu, Donald Fraser, and Eugene Furtado, 1990, "Hostile bank takeover offers," *Journal of Banking and Finance*, Vol. 14, December, 1229-1242.

Beatty, Randolph P., Anthony M. Santomero, and Michael Smirlock, 1987, "*Bank merger premiums – analysis and evidence*," Monograph 1987a-3, New York University: Salomon Brothers Center for the Study of Financial Institutions.

Benston, George J. , W.Curt Hunter and Larry D. Wall, 1995, "Motivations for bank mergers and acquisitions: enhancing the deposit insurance put option versus earnings diversification," *Journal of Money, Credit, and Banking*, Vol. 27, August, 777-788.

Berger, Allen N, Robert DeYoung, Hesna Genay, and Gregory F. Udell, 2000, "Globalization of financial institutions: evidence from cross-border banking performance," in Brookings-Wharton Papers on Financial Services *Toward a Global Financial Market*.

Boyd, John and Stanley Graham, 1991, "Investigating the bank consolidation trend," Federal Reserve Bank of Minneapolis *Quarterly Review*, Vol. 15, spring, 3-15.

Brewer, Elijah, William Jackson, Julapa Jagtiani, and Thong Nguyen, 2000, "The Price of Bank Mergers in the 1990s," *Economic Perspectives*, Federal Reserve bank of Chicago, First Quarter, 2-23.

Brickley, James, J.L. Coles, R.L. Terry, 1994, "Outside Directors and the Adoption of Poison Pills," *Journal of Financial Economics*, Vol. 35, 371-390.

Brickley, James and Christopher James, 1987, "The Takeover Market, Corporate Board Composition, and Ownership Structure: The Case of Banking," *Journal of Law & Economics*, Vol. 30, April, 161-180.

Bryd, J.W. and K.A. Hickman, 1992, "Do Outside Directors Monitor Managers? Evidence from Tender Offer Bids," *Journal of Financial Economics*, Vol. 32, 195-222.

Cheng, David, Benton Gup, and Larry Wall, 1989, "Financial determinants of bank takeovers," *Journal of Money, Credit and Banking*, Vol. 21, No. 4, November, 524-536.

Cornett, Marcia Millon, Gayane Hovakimian, Darius Palia, and Hassan Tehranian, 2000, "The Impact of the Manager-Shareholder Conflict on Acquiring Bank Returns," Working paper - Boston College, May.

Cornett, Marcia Millon and Sankar De, 1991a, "Common stock returns in corporate takeover bids: evidence from interstate bank mergers," *Journal of Banking and Finance*, Vol. 15, April, 273-295.

\_\_\_\_\_, 1991b, "Medium of payment in corporate acquisitions: evidence from interstate bank mergers," *Journal of Money, Credit and Banking*, Vol. 23, November, 767-776.

Cornett, Marcia Millon and Hassan Tehranian, 1992, "Changes in corporate performance associated with bank acquisitions," *Journal of Financial Economics*, Vol. 31, April, 211-234.

Cotter, James, Anil Shivdasani, and Marc Zenner, 1997, "Do Independent Directors Enhance Target Shareholder Wealth During Tender Offers?" *Journal of Financial Economics*, Vol. 43, 195-218.

DeYoung, Robert, 1999, "Mergers and the changing landscape of commercial banking," Federal Reserve Bank of Chicago, *Chicago Fedletter*, Number 145, September 1999.

Desai, Anand and Roger D. Stover, 1985, "Bank holding company acquisitions, stockholder returns, and regulatory Uncertainty," *The Journal of Financial Research*, Vol. 8, Summer, 145-156.

Dubofsky, David A. and Donald R. Fraser, 1989, "The differential impact of two significant court decisions concerning banking consolidation," *Journal of Banking and Finance*, Vol. 13, July, 339-354.

Eckbo, B. Espen and Herwig Langohr, 1989, "Information disclosure, measure of payment, and takeover premiums: public and private tender offers in France," *Journal of Financial Economics*, Vol. 24, October, 363-404.

Fama, Eugene, 1980, "Agency Problems and the Theory of the Firm," *Journal of Political Economy*, Vol. 88, 288-307.

- Fama, Eugene and Michael Jensen, 1983, "Separation of Ownership and Control," *Journal of Law and Economics*, Vol. 26, 301-325.
- Frider, Larry A., 1988, "The interstate banking landscape: Legislative policies and rationale," *Contemporary Policy Issues*, Vol. 6, April, 41-66.
- Fraser, Donald R. and James W. Kolari, 1988, "Pricing small bank acquisitions," *Journal of Retail Banking*, Vol. 10, winter, 23-28.
- Healy, Paul M., Krishna Palepu, and Richard S. Ruback. 1991, "Does corporate performance improve after mergers?," *Journal of Financial Economics*, Vol. 31, April, 135-175.
- Hunter, William C. and Larry Wall, 1989, "Bank mergers motivations: A review of the evidence and examination of key target bank characteristics," *Federal Reserve Bank of Atlanta Economic Review*, Vol. 74, September/October, 2-19.
- Kane, Edward J., 2000, "Incentives for banking megabank mergers: What motives might regulators infer from event-study evidence," *Journal of Money, Credit and Banking*, Vol. 32, August, 671-701
- Jensen, Michael and Richard S. Ruback, 1983, "The market for corporate control: The scientific evidence," *Journal of Financial Economics*, Vol. 11, April, 5-50.
- Neely, Walter, 1987, "Banking acquisitions: acquirer and target shareholder returns," *Financial Management*, Vol. 16, winter, 66-74.
- Palia, Darius, 1993, "The managerial, regulatory, and financial determinants of bank merger premiums," *The Journal of Industrial Economics*, Vol. 41, March, 91-102.
- \_\_\_\_\_, 1994, "Recent evidence on bank mergers," *Financial Markets, Institution & Instruments*, Vol.3, No.5,
- Rhoades, Stephen A., 1987, "Determinants of premiums paid in bank acquisitions," *Atlantic Economic Journal*, Vol. 15, no 1, 20-30.
- Rogowski, Robert J. and Donald G. Simonson, 1989, "Bank merger pricing premiums and interstate bidding," in *Bank Mergers: Current Issues and Perspectives*, edited by Benton E. Gup, Kluwer Academic Publishers, Amsterdam, Netherlands, 87-106.
- Rose, Peter S., 1991, "Bidding theory and bank mergers premiums: The impact of structural and regulatory factors," *Review of Business & Economic Research*, Vol. 26, no.2, 22-40.
- Rosenstein, Stuart and Jeffrey Wyatt, 1997, "Inside Directors, Board Effectiveness, and Shareholder Wealth," *Journal of Financial Economics*, Vol. 44, 229-250.

-----, 1990, "Outside Directors, Board Independence, and Shareholder Wealth," *Journal of Financial Economics*, Vol. 26, 175-191.

Saunders, A., 1997, *Financial institutions management: A modern perspective*, 2<sup>nd</sup> edition, Irwin: Chicago.

Savage, Donald T., 1993, "Interstate banking: a status report," *Federal Reserve Bulletin* 73, December, 1075-1089.

Shawky, Hany, Tobias Kilb, and Carsten Staas, 1996, "Determinants of bank merger premiums," *Journal of Economics and Finance*, Vol. 20, spring, 117-131.

Siems, Thomas, 1996, "Bank mergers and shareholder wealth: evidence from 1995's megamerger deals," *Federal Reserve Bank of Dallas: Financial Industry Studies*, August, 1-12.

Sushka, Marie E., and Yvette Bendeck, 1988, "Bank acquisitions and stock holders' wealth," *Journal of Banking and Finance*, Vol. 12, December, 551-562.

Travlos, Nickolaos, 1987, "Corporate takeover bids, methods of payment and bidding firms' stock returns," *Journal of Finance*, Vol. 42, September, 943-964.

Trifts, Jack W., Kevin P. Scanlon, 1987, "Interstate bank mergers: The early evidence," *The Journal of Financial Research*, Vol. 10, winter, 305-311.

Subrahmanyam, Vijaya, Nanda Rangan, and Stuart Rosenstein, 1997, "The Role of Outside Directors in bank Acquisitions," *Financial Management*, Vol. 26, Autumn, 23-36.



Table 1: Bank mergers from 1990 to mid-1998

Panel A: Frequency distribution

1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
4	11	15	15	18	30	31	43	22	189
2%	5.8%	7.9%	7.9%	9.5%	15.9%	16.4%	22.7%	11.6%	

Panel B: Characteristics of the Sample of Bank Mergers from 1990 to mid-1998

Variables	Mean	Standard deviation
Bid premium	2.2517	0.8094
ROA of target	0.9014	0.5563
Variance of ROA of target	0.2798	0.5761
Variance of ROA of acquirer	0.1771	0.4201
Covariance of ROA of target and acquirer	0.0873	0.1398
Total assets of target to total assets of acquirer	0.2826	0.3387
Proportion of inside directors	0.1893	0.1126
Proportion of gray directors	0.0541	0.0845
Proportion of independent directors	0.7566	0.1380
Board size	13.5608	5.4081
Managerial ownership share	0.0671	0.0902
Gray director ownership share	0.0108	0.0317
Total assets of target (Millions)	\$8,188	
Total assets of acquirer (Millions)	\$28,901	

Panel C: Differences in book value premium in pre- and post- Riegle-Neal periods

Pre-Riegle Neal	Post-Riegle-Neal	Difference
1.8124 (63)	2.4713 (126)	6.38 (p-value=0.0001)

Table 2: The Correlation of Selected Variables with Merger Bid Premium  
Earning-Diversification vs Deposit-Insurance-Put-Option Hypothesis

Variable	Earnings-Diversification Hypothesis	Deposit-Insurance Put-Option Hypothesis
ROA	(+)	(?)
Var <sub>T</sub>	(-)	(+)
Var <sub>A</sub>	Not significant	(+)
Cov <sub>AT</sub>	(-)	(+)
TA <sub>T</sub> /TA <sub>A</sub>	(-) or (+)	Not significant

Table 3: Relationship Between Bid Premium Offered for the Target and the Target Financial Characteristics

Dependent variable is the merger bid premium. P-values are reported in parentheses.

Variables	Basic Controls	Interstate Binary Variable	Interstate Binary, Board Composition, and Ownership Variables
Return on assets	0.3601 (0.002)	0.3184 (0.0007)	0.2919 (0.0015)
Variance of ROA of target	-0.1969 (0.0113)	-0.2142 (0.0051)	-0.1859 (0.0140)
Variance of ROA of acquirer	0.0050 (0.9704)	0.0261 (0.8452)	-0.0133 (0.9190)
Covariance of ROA of target and acquirer	0.5759 (0.1759)	0.5765 (0.1664)	0.4798 (0.2373)
Total assets of target to total assets of acquirer	-0.0286 (0.8685)	0.1120 (0.5242)	0.0876 (0.6116)
Total assets of target to total assets of acquirer if the ratio is less 0.0592 and zero otherwise	4.4006 (0.2777)	5.6834 (0.1552)	5.3024 (0.1727)
Total assets of target to total assets of acquirer if that ratio is between 0.0592 and 0.1665 and zero otherwise	2.5946 (0.0700)	2.5480 (0.0692)	2.4820 (0.0683)
Total assets of target to total assets of acquirer if that ratio is between 0.1665 and 0.3543 and zero otherwise	1.4358 (0.0150)	1.5762 (0.0067)	1.7000 (0.0029)
Total assets of target to total assets of acquirer if that ratio is between 0.3543 and 0.5000 and zero otherwise	0.5503 (0.2138)	0.5868 (0.1761)	0.4700 (0.2654)
Interstate binary variable		-0.2687 (0.0044)	-0.2991 (0.0014)
Proportion of independent directors			1.0130 (0.0024)
Board size			0.0082 (0.3423)
Insider ownership			-0.0263 (0.9563)

Table 3: Relationship Between Bid Premium Offered for the Target and the Target Financial Characteristics (Cont'd)

D_1991	0.8819 (0.0133)	0.8927 (0.0106)	0.8704 (0.0105)
D_1992	0.5704 (0.0945)	0.5702 (0.0878)	0.5219 (0.1079)
D_1993	1.0812 (0.0015)	1.1688 (0.0005)	1.2200 (0.0002)
D_1994	0.7977 (0.0176)	0.8706 (0.0085)	0.8779 (0.0066)
D_1995	0.7788 (0.0152)	0.8281 (0.0086)	0.8252 (0.0071)
D_1996	0.9280 (0.0043)	0.9852 (0.0020)	1.0273 (0.0011)
D_1997	1.7228 (0.0001)	1.7662 (0.0001)	1.7956 (0.0001)
D_1998	1.7238 (0.0001)	1.7332 (0.0001)	1.7361 (0.0001)
Number of observations	187	187	187
Adjusted R <sup>2</sup>	0.4667	0.4889	0.5184
F-statistic	10.574	10.883	10.532

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