

Bidder Returns and Merger Anticipation: Evidence from Banking Deregulation[☆]

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Abstract

This paper provides new estimates of the anticipated components of bidder returns. To capture these estimates, I focus on the banking industry around the passage of interstate deregulation (Riegle Neal Act of 1994). Overall, I find firms that became bidders after Riegle Neal have large significant positive returns during its passage. Moreover, these positive wealth effects are significantly larger than the effect at actual merger announcements. These results suggest bidder returns are anticipated and focusing only on narrow event windows underestimates gains to bidders. Finally, the positive bidder returns provide evidence against both the entrenchment and hubris hypotheses. Additional tests provide evidence mergers are motivated by synergy rather than disciplinary motives.

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Introduction

Research in corporate finance over the past thirty years clearly documents an empirical regularity of non-positive bidder returns around merger announcements. Ostensibly, this apparent persistent destruction in shareholder wealth appears enigmatic. Yet, past studies have proposed numerous justifications for these non-positive returns. One interpretation is that mergers are motivated by hubris and are not wealth maximizing ventures (Roll, 1986). Consistent with this, Moeller, Schinglemann, and Stulz (2004, 2005) suggest firms undertaking acquisitions suffer significantly. In particular, Moeller et al. (2004) note from 1980 to 2001 bidder shareholders lost over \$250 billion around 12,000 takeovers while Moeller et al. (2005) find wealth destruction in the 1990s on a “massive scale.” Overall, these studies imply that non-positive bidder returns are motivated by entrenchment and/or hubris.

An alternative interpretation, however, is non-positive bidder returns are a function of methodological issues. In estimating bidder wealth effects, for example, the standard estimate is the abnormal return over a narrow event window. Yet early studies of bidder returns during control changes note the difficulty in accurately measuring returns and document price changes at a merger reflect changes in expectation (Jensen and Ruback, 1983; Asquith, Brunner, and Mullins, 1983; and Malatesta 1983). These studies suggest problems in measuring bidder returns around the merger may be caused by the prior capitalization of gains from takeover bids. Recent work indicates analysis of a narrow window around an announcement reports only the surprise content of a merger (Bhagat, Dong, Hirshleifer, and Noah, 2004; Hietala, Kaplan, and Robinson, 2003). Boone and Mulherin (2007), find low bidder returns are a function of a competitive takeover market (public and private) while Mitchell, Pulvino, and Stafford (2004) note price

pressure from merger arbitrage biases bidder returns downward. Collectively, these studies suggest non-positive bidder returns are likely the result of measurement issues, not hubris.

As a related examination of the methodological issues in the estimation of bidder returns, some past studies have focused on the impact of regulatory changes related to the market for corporate control; recognizing the market may not wait until a merger announcement to react to expected future takeovers. As such, prior literature documents the time to measure the impact of an event is when new information is released, rather than when the event occurs. For example, Schipper and Thompson (1983) indicate the primary stock reaction (if any) should take place at the announcement of a policy decision rather than at subsequent implementation of that policy (unless it represents a surprise). Specific events which occur as part of a policy decision give only a partial measure of the benefits to shareholders of these policy decisions.

To provide new estimates of anticipated components of bidder returns, I examine a sample of bidders from the banking industry that undertook acquisitions in the 1990s. I chose this industry as it has a well-defined deregulatory event (Riegle Neal Act of 1994) that explicitly enable mergers by freeing bidding constraints and thus increasing acquisition activity (Berger, Kayshap, and Scalise, 1995). To gauge anticipation in bidder returns, I compare wealth changes around the act's passage with subsequent bidder returns at the actual merger announcements.

This research design also enables me to provide novel tests to distinguish between four merger hypotheses: managerial entrenchment, hubris, disciplinary motives, and synergy. In particular, both the entrenchment and hubris hypotheses predict negative bidder returns as a result of a willingness to overpay and a decrease in corporate focus, respectively. Thus, if the market anticipates future takeover activity at deregulation, we would expect negative returns for future bidders. In contrast, the disciplinary and synergy hypotheses predict positive bidder

returns. The disciplinary hypothesis suggests, on average, all future bidders should gain by acquiring an ineffectively-run target. The synergy hypothesis, however, predicts only positive bidder returns to those firms that significantly reduce costs. This hypothesis would predict bidders in multiple states would likely gain the most because they would be able to consolidate operations into one headquarter (e.g., reduce paper work, merge separate boards, etc.).

The main finding from this analysis is firms that became bidders after Riegle Neal was enacted have large significant positive returns during the passage of this event (statistically and economically) Moreover, the magnitude of the positive bidder returns is significantly larger than the returns to these same firms around the announcement date of actual bids. In particular, using a narrow announcement window date, the effect to bidders at the actual merger is negative and insignificant. Moreover, returns over the entire event window (announcement to end date) are also insignificant. The overwhelming market reaction to a takeover bid occurs not around the merger announcement window, but during the passage of the actual deregulatory event.

These positive bidder returns provide evidence against both the entrenchment and hubris hypotheses. As bidders tend to be larger with operations in multiple states, these firms stood to gain the most in cost savings. Returns for bidders in multiple states are significantly positive while those in only one state are insignificant. Given multiple-state bidders experience significantly greater returns (controlling for size) suggests mergers are motivated by synergy rather than disciplinary motives. These results hold whether I test effects on actual or *expected* merger participants (determined ex-ante rather than ex-post). Furthermore, the reaction of subsequent bidders to the deregulatory event is larger than the reaction of targets (actual or theoretical), whether measured in returns, absolute or average dollar gain, or percentage change.

Contrary to extant literature (Carow and Lee, 1997; Brook, Hendershott, and Lee, 1998), these positive bidder gains around Riegle Neal cannot solely be attributable to the anticipation these firms would be takeover targets post deregulation. More likely, these gains are also the result of expected future savings due to a decrease in paper work, regulatory compliance, and legal structure. The difference in returns to bidders with branches in one versus multiple states supports this. These results suggest bidder returns are anticipated (Malatesta and Thompson, 1985) and occur during legislation that by definition was expected to increase merger activity. This provides further evidence (consistent with Song and Walkling, 2008) examining bidder returns over a narrow merger announcement window does not capture the full wealth effects.

The paper proceeds as follows. Section 1 chronicles the evolution of interstate regulation. Methodology is detailed in Section 2. Section 3 examines the deregulatory effect around the Act and merger announcements. Section 4 compares ex-ante to ex-post analyses while robustness tests are presented in Section 5. Section 6 provides implications for future research.

1. Evolution of regulation

The evolution of banking regulation in the U.S. has followed a federal and state approach. While federal regulators passed some legislation to create parity and/or provide new opportunities, much regulation was left to states, which allowed the passage of regulation at different times. Some states opened banking markets early, others protected local banks. Table 1 details regulation related to mergers and interstate branching from 1863 until 1994.

This difference in state laws created discrepancies in banking practices and left some banks better able to expand. In terms of interstate banking, the first key step towards national interstate branching was the 1985 ruling by the U.S. Court of Appeals (IBA, NY v. Marine

Midland Bank, N.A.) that upheld the OCC's 1981 policy independently owned and operated ATMs in a supermarket were not bank branches if the ATMs were not established by the bank.

Nearly a decade later, the use of the 30-mile rule, which allowed national banks to move headquarters up to 30 miles even if they crossed state lines, is often considered the last impetus to removing branching restrictions. This rule allowed banks in depressed areas to move to more profitable areas without chartering new banks. In general, it was rarely used and those banks that moved headquarters usually closed old branches. By the 1990s, however, several banks used this rule to circumvent interstate restrictions and consolidate operations (see Appendix A for details).

Since the 1960s, there have been numerous legislative changes related to branching and banking both at the state and federal level. A number of deregulation studies have focused on the effects of these changes. Table 2 details seven of these studies.¹ Most of these studies, however, do not directly examine mergers after a legislative event to determine if firms involved gain. Rather, these studies use proxies for takeovers to indirectly test deregulatory effects and, in general, find mixed results based on bank size and location. Black, Field, and Schweitzer (1990) find superregionals gain, while money centers do not. Billingsley and Lamy note relatively small and absolutely large banks gain, while Fraser, Hooton, Kolari, and Reising (1997) show large firms gain the most. Goldberg, Hanweck, and Sugrue (1992) find out-of-state banks gain.

More recently, several studies examine the effects of Riegle Neal's passage. Carow and Lee (1997) study several interstate-banking laws including Riegle Neal by forming a sample of 25 banks acquired after Riegle Neal, but before year's end. Due to sample size, they also

¹ Neely and Wheelock (1997) examine New England banks and extrapolate the total value of interstate branching. Others examine deregulation by focusing on changes in efficiency (Economides, Hubbard, Palia, 1996; Kroszner and Strahan, 1999; DeYoung, Hasan, and Kirchhoff, 1998; Jayaratne and Strahan, 1996; Stiroh and Strahan, 2003).

examine a sample of firms selected by unspecified characteristics and find non-money centers gain. The authors interpret this finding as being related to the probability of later being acquired.

Carow and Heron (1998) also study Riegle Neal by focusing on 90 interstate and 90 non-interstate BHCs. The authors use return on assets, capital ratios, interaction of the two, and size as proxies for takeovers. Carow and Heron find, on average, all banks gain from Riegle Neal with two-day average returns of 2.2%. However, the authors indicate targets and non-interstate BHCs earn the most. They interpret their results to conclude these returns are directly related to the passage of interstate deregulation and likely targets will gain the most in the short-term.

Brook, Hendershott, and Lee (1998) study the effect of Riegle Neal on 290 banks using proxies for takeovers (Q-ratios, ROE, assets, and branch size) to determine which banks gained. They also examine 60 post Riegle Neal transactions (acquisitions or asset sale pre-Sept. 1996) assuming if returns at passage are due to future expected takeover activity, then firms that merge after Riegle Neal should experience the highest gains. The authors find post-acquired banks have higher returns than all banks (16.7% v. 13.3%) and extrapolate these results to determine Riegle Neal led to \$85 billion in value created for the banking industry. Further, the poorest performing banks benefited the most due to increased takeover discipline; suggesting deregulatory returns are attributed to future expected takeover gains. In sum, prior studies of Riegle Neal suggest gains are focused on relatively small firms with limited branching operations and expected future takeover targets. In terms of takeovers, it is unclear whether interstate branching creates value for future bidders. As a result, I extend this analysis to future bidder firms.

2. Analysis of regulation and deregulation in banking

Past studies have found bidder returns are non-positive around merger announcements. These results could be due to hubris or measurement issues. This analysis extends prior research by focusing on merger returns for a sample of banking bidders that undertook acquisitions in the 1990s. I chose the banking industry because it has a well defined deregulatory event that explicitly enabled mergers and provides an ideal environment to capture anticipation effects. To gauge the full wealth effects, I examine bidder returns around Riegle Neal's passage as well as subsequent bidder returns at actual merger announcements.

As noted, Brook et al. (1998) document Riegle Neal created \$85 billion in value. This is a large amount given Becher (2000) finds less than \$1 billion created for 558 bank mergers over 18 years. If such an amount is created during the deregulatory process, these large gains would not be captured in subsequent takeover announcement returns. By examining future bidders, I provide new estimates of anticipated components of bidder returns and further evidence focusing on a narrow event window underestimates returns.

2.1. Hypotheses

By focusing this analysis on firms that become bidders after Riegle Neal, I am also able to provide unique tests of four merger hypotheses: managerial entrenchment, hubris, disciplinary motives, and synergy. In general, the managerial entrenchment hypothesis predicts lower wealth effects to bidders by protecting management from market forces. Shleifer and Vishny (1989) indicate managers buy assets to entrench themselves and are thus willing to overpay for targets. As a result, negative returns to future bidders would be indicative of this hypothesis. Similarly, mergers post Riegle Neal may be motivated by non-synergistic reasons such as empire building or managerial hubris; Roll (1986) was among the first to document bidders may undertake

mergers not to maximize shareholder value, but for self-serving motives. As a result, the hubris hypothesis would predict negative bidder returns due to a decrease in corporate focus.²

In contrast, the disciplinary motives (inefficient management) hypothesis, outlined in Mandelker (1974) and expanded by Lang, Stulz, and Walkling (1989), predicts positive bidder returns. The theory suggests bidder gains occur due to the acquisition of an ineffectively run target and potential for realizing significant gains in improving its performance. The disciplinary motives theory would predict positive returns to *any* future bidders due to potential gains.

The synergy hypothesis would also predict positive bidder gains. However, this hypothesis (Bradley, Desai, and Kim, 1985; Jensen, 1993) would predict significantly positive returns only to those bidders with the ability to cut costs, perhaps by merging separate boards, decreasing paperwork, etc. Under the synergy hypothesis, bidders with expanded operations across geographic lines post Riegle Neal would be expected to gain the most.

2.2. *Methodology from event study analysis*

As a complement to analysis of corporate events, a body of research studies the wealth effects of (de)regulation. However, event study analysis of a deregulatory event requires certain modifications not required in traditional announcement date event study analysis (Brown and Warner, 1985). Mulherin (2007) provides an overview of theoretical and empirical analyses of regulation while Schwert (1981) and Binder (1985) document difficulties in measuring returns around the passage of regulation and outline methods necessary to obtain accurate returns.

² The banking industry may be more susceptible to empire building than others given the dearth of hostile takeovers. Legal experts contend nearly any bank can thwart an unwanted takeover attempt by hiding behind regulatory agencies. For example, numerous times in 1993 and 1994, First Chicago was named a likely takeover target given its dominant position in the third largest U.S. city. Executives at First Chicago, however, publicly refused to consider *any* deal that did not leave the combined bank's headquarters in Chicago. The official rationale given for this condition was "Chicago should have a major bank based there..." (Knecht, 1994). The possibility of removal by corporate control may be significantly lower given the nature of banking and make executives more insulated.

Mulherin (2007) notes a “one-size-fits all approach” to estimating regulatory effects is not prudent. Binder (1985) finds determining abnormal returns to regulatory events is difficult, as the exact date of effect is not known. By the time legislation has been signed, the market largely has already anticipated its effect. Thus, signing legislation into law would bring new information only if the President suddenly agreed to sign legislation that he previously declared he would veto.

Given the lack of information at signing, the time prior to signing is examined to determine key dates that indicate information on the probability of the law’s passage. Schwert (1981) stresses the importance of conducting tests of abnormal returns. For a single takeover, calculating abnormal returns and then deriving an overall average is reasonable given the attempts are likely to be independent. With legislation, the effect to each bank is likely correlated to that of other banks. Individual abnormal return calculations may therefore overstate the effect.

One procedure is to form a portfolio of all firms and measure returns as the percentage change in the group’s market value for a given time period (Schwert, 1981). Specifically,

$$R_p = \frac{1}{N} \sum_{i=1}^n R_i \quad (1)$$

where R_p is the portfolio’s return, n is number of firms in the portfolio, and R_i is the i th’s firm daily return. A test statistic determines if the law’s passage had a significant effect on the group. The historical portfolio average return is subtracted from actual return and divided by the portfolio return’s historical standard deviation (adjusted for number of observations).

An alternate procedure regresses the daily return of a portfolio of banks on a market index. Dummy variables that capture average daily returns during each regulatory date are used for all pertinent dates. For bank mergers, an appropriate procedure can be outlined around Riegle

Neal. As indicated, this bill allowed intrastate and interstate branching as well as allowed banks to consolidate operations across state lines (subject to a few exceptions). By definition, the bill's passage was expected to increase merger activity. Thus, banks involved in mergers after Riegle Neal should experience positive returns in anticipation of this takeover activity.

However, it is important to note while the bill was before Congress there was uncertainty whether it would be enacted. In prior years, Congress had failed to enact similar legislation and disagreements between the House and Senate on this version persisted into the summer (Table 1). To reflect this uncertainty, as suggested in Binder (1985), an event window when the bill was before Congress (155 days) is used rather than one date. Further, it is likely not all groups of banks were affected the same (Schwert, 1981). As a result, various portfolios can be formed to measure returns to different bank groups affected by this bill's passage.

3. Deregulation returns and future takeovers

In studying the effect of Riegle Neal on publicly traded banks, I begin with all 619 banks in existence on the *Center for Research in Security Prices (CRSP)* tapes during the event window February to August 1994. To obtain this sample, all firms with a three-digit SIC code of 602 (banks) or 671 (holding companies) were chosen. Not all SIC 671_ are banking companies (both BankAmerica and RJR Nabisco have SIC codes of 6711, but only BankAmerica is a bank holding company). As a result, I searched ((*Lexis-Nexis*, SEC filings, and Moody's) for each firm's primary business and any non-banking firms were deleted.

Thus, this study analyses the wealth effects for the full sample of 619 banks. Further, I segment these 619 firms into portfolio of 65 firms that were subsequent bidders after September

29, 1994 (date Riegle Neal signed into law) and prior to December 31, 1996³, as well as the 114 subsequent targets (CRSP delisting codes in 200's or 300's), 12 firms that were both a target and a bidder, and 428 firms that were neither a target nor a bidder.

Following methodology first outlined in Schwert (1981) and Binder (1985), I study the wealth effects for the full period in which Riegle Neal was proposed in Congress. A review of legislative documents and periodicals indicates Riegle Neal was first voted on February 1, 1994 by a subcommittee of the House Banking Committee and passed the full Senate on September 13. As indicated, Table 1 details the major legislative events during this period and their outcome. Hence, February 1 to September 13, 1994 is the event window for this analysis.⁴

3.1. Deregulation announcement period returns

To compute the wealth effects of deregulation, I regress the bank portfolio return on the market over a one and a half year estimation window⁵ (July 1, 1993 to December 31, 1994):

$$R_i = \alpha + \beta_1 R_m + \beta_2 D_1, \quad (2)$$

where R_i is the daily return for all firms in each portfolio, R_m is the daily value- or equal-weighted market index, and D_1 is a binary variable equal to one when the legislation is before Congress (February 1, 1994 through September 13, 1994) and zero otherwise.

Table 3 reports returns for bank portfolios around Riegle Neal's passage. Panel A details full sample results. The coefficient on the binary variable indicates average daily return to all banks is 0.10% (p-value 0.04) using a value-weighted market index; equal-weighted 0.06% (p-

³ All analysis is also conducted extending this window to December 31, 1997. In general, results are the same though a few estimates, while still statistically significant, are noticeably lower. This is likely due to the fact that at some point the markets would be unable to predict future takeovers so many years in the future. In order to compare my results to other Riegle Neal studies, I present results through the 1996 period.

⁴ The bill was signed September 24, 1994. The president clearly indicated his intention to sign previously; thus this date was a non-event. Results are qualitatively the same if the event window is extended to September 24, 1994.

⁵ Various estimation windows (1, 1½, and 2 years) were used. In all cases, overall results did not vary.

value 0.02). Canina, Michaely, Thaler, and Womack (1998) note the use of an equal-weighted index over extended windows may lead to biased results.⁶ As a result, for the remainder of the paper I focus on the value-weighted index. Given the legislative window is 155 days; this daily return translates into a 17.3% cumulative abnormal return over the entire passage period.

Panel B details the effects on portfolios of bidders, targets, both targets and bidders, and neither. *Bidder* daily returns are 0.15% (p-value 0.02). Given these returns are significantly positive, this provides evidence against the managerial entrenchment or hubris hypotheses. *Target* daily returns are 0.11%. *Both returns* are 0.06%, but not significant (perhaps due to small sample). *Neither firm* returns are 0.09% (p-values 0.05). Overall, all banks gain from the passage of Riegle Neal and bidder gains are not significantly lower than targets. Indeed, for bidders, this daily return translates into a 26.31% cumulative abnormal return over the entire period. The response to deregulation provides further evidence future targets are not the only beneficiaries of deregulation and these mergers do not appear driven by managerial entrenchment or hubris.

Moreover, the magnitude of positive bidder returns is significantly larger than to these firms around the actual bid announcements (Table 4). Using a narrow window, the bidder effect at the merger is, on average, an insignificant -0.61% (half billion dollar loss). Moreover, entire event window returns (announcement to end) are insignificant, 2.47% (\$2.25 billion created).⁷ The overwhelming market reaction to a takeover bid occurs not around the announcement, but during the passage of the deregulatory event (creating nearly \$25 billion for bidders alone).

⁶ The bias in using the equal-weighted index is due, in part, to the illiquidity of small firms. In particular, in the 1990s there is roughly a 1.6% per month difference between returns using value- and equal-weighted daily indexes.

⁷ Announcement returns are calculated using *CRSP* value-weighted index (with distributions) over a 36-day window (-30, +5) to capture run-up. Similar results are obtain using 7- (-5, +1) or 3-day (-1, +1) event windows or a market

3.2. Interstate branching

Results indicate subsequent bidders experience significantly positive returns during the passage of Riegle Neal. These gains cannot be solely attributed to anticipation some firms would be acquired post deregulation. More likely, these gains are also the result of expected future cost savings. For example, Bank of America estimated in 1993 interstate restrictions cost it roughly \$50 million a year (need for separate boards, audit committees, and other ‘artificial transactions’) yet “adds nothing to the safety and soundness of the banking system” (Cocheo, 1993).

It is possible gains to subsequent bidders are driven by disciplinary not synergistic reasons. In order to distinguish between these two, I segment bidders based on branch location pre-Riegle Neal.⁸ If future bidders gain in expectation of cost savings, then those in multiple states (highest ability to save) should gain the most. If gains are due to replacement of ineffective management, there should be no difference based on interstate location; *all* bidders should gain. Table 5 details bidder returns based on the number of states a bidder has branches in pre-Riegle Neal. *One state* are 32 bidders who operate in only one state while *Multiple states* are the 33 with branches in 2+ states. Carow and Lee (1997) indicate banks in 3+ states are a proxy for acquirers, so bidders are segmented into one or two (43 firms) versus three or more (22 firms).

Table 5 indicates a difference in returns based on geographic branching. *One state* returns are insignificantly positive (p-value 0.47) while *Multiple* returns, are large (~ 0.19% daily return) and significant (p-value 0.02). Similarly, returns in only one *or* two states are insignificant, while returns to bidders in three or more are positive and significant (p-value 0.03). It appears Riegle Neal created positive wealth effects likely due to synergistic gains. Further, these results are

model with a 90-day estimation window (-120, -31). Entire event window returns (announcement to end date) are calculated as buy-and-hold abnormal returns (Barber and Lyon, 1997).

consistent with Akhigbe and Whyte (2003) who find firms with assets in multiple states see a significant reduction in risk post Riegle Neal, while those with assets in one state do not.

These results, however, may be a function of whether a state opted-in early to the branching component (Appendix A details all the components of Riegle Neal, including opting out or opting in early). States had the ability to opt in early to the consolidation of cross-state operations by turning out-of-state banks into interstate branches of the main bank. If significantly positive returns for bidders in multiple states are due to anticipation of cost savings from consolidating, then the market should reward banks in those states that opt in early more.

Table 6, therefore, details the effect on 65 bidders based on if they were headquartered in a state that opted-in early to the interstate branching component. Panel A shows the stock return effect based on adoption date while Panel B details the stock return effect based on adoption date intersected with geographic branching. In all, 19 states opted in early. *Opt-in early states* are the 33 banks headquartered in a state that opted into interstate branching early⁹ while *On schedule states* are the 32 banks in a state that did not opt in early (but did not opt out either).

Panel A indicates bidders in a state that opts in early experience significantly positive returns during the bill's passage (p-value of 0.02). Yet bidders in states that did not opt in early also have significantly positive returns (p-value 0.09), though coefficient and magnitude are smaller (chow test not shown). This may not be surprising since not all bidders in states that adopt interstate branching early have operations in multiple states and thus able to reduce costs.

⁸ Branch data are collected from SNL's *DataSource* and *Thomson/Polk Bank Directory* (which has changed ownership and names several times, from 1991 – 1997 the data were published under the *Thomson Bank Directory*).

⁹ As noted in Appendix A, Minnesota opted-in early with restrictions and Missouri opted-in early only for those out of state banks within 30 miles of the Missouri border. Analyses are conducted both including and excluding Minnesota and Missouri in the set of opt in early states and are qualitatively the same in either case.

Bidders in states that opted-in early or on schedule are segmented further into those with branches in one or multiple states. Again, if gains come from the ability to reduce costs, then those bidders in states that opt in early *and* have branches in multiple states should gain the most. Results in Panel B clearly reflect this. Bidders with operations in only one state have insignificant returns whether the bidder state opts in early (13 bidders) or not (19 bidders). For those with branches in multiple states, returns are significant (p-value 0.00) for bidders in a state that opts in early (20 bidders) and marginally significant (p-value of 0.08) if not (13 bidders). A chow test of the difference in coefficients (not shown) has a p-value of 0.06. Overall, these results provide support for the synergy hypothesis over the managerial entrenchment hypothesis.

3.3. *Economic impact of Riegle Neal*

Table 7 attempts to quantify the economic gains for portfolios around Riegle Neal. I find *overall returns* of roughly 10% to 25%, where *overall returns* are calculated from dummy coefficients and compounded over the 155-day window. To determine the economic impact, I calculate change in value as the market value (dollar billion) times overall returns. *Market value* is the value of equity of all firms in each portfolio pre-deregulation. I find subsequent bidders experience nearly half of the \$50 billion in value created by Riegle Neal for all public banks.

Next, Panel B details bidder economic gains based on geographic branching. Returns for bidders in multiple states are nearly four times greater than those in only one state (over 34% vs. less than 9%) This indicates positive bidder returns are driven, in large part, by expected future cost savings rather than disciplinary motives. These results are consistent with Goldberg et al. (1992) and Carow and Lee (1997) who find banks that make interstate acquisitions post-deregulation are expected to gain from relaxation of interstate banking laws.

Panel C details the economic gains for bidders based on the adoption date of the interstate branching component. Returns for bidders in states that opt-in early are over 1½ times greater than for those that do not. It appears opting in early results in marginally higher returns, but the overwhelming determinant is if a bidder has branches in more than one state. Again, this suggests these returns are driven, in part, by expected future cost savings. Moreover, all three panels detail the subsequent bidder effect holds whether measured in total returns, absolute or average dollar gain, or percentage change. Bidders that stood to gain the most from Riegle Neal are those that reduced costs the most (e.g., in multiple states). These bidder gains are likely due to the anticipated savings from reduced paper work, regulatory compliance, and legal structure.

4. Ex-ante versus ex-post analyses

Results demonstrate future bidders gain from deregulation. Yet use of information not known at the event may be problematic. Differentiating bidders/targets based on announcement reaction presumes market participants can distinguish among these banks. Carow and Lee (1997) note ex-post information may bias tests toward finding a relationship, if one exists. The authors employ ex-ante measures of acquisition likelihood; using firm size, performance, branches, and capitalization ratios to identify, pre-Riegle Neal, likely future merger participants.¹⁰

Therefore, for all 619 banks in existence prior to Riegle Neal, I study hypothetical participants ex-ante rather than ex-post. In doing so, I identify potential bidders *pre*-Riegle Neal based on factors from past studies (size, employees, deposits, efficiency, capital ratios, etc.) to determine if hypothetical bidders also gain. Past studies note the rationale for including these

¹⁰ However, the popular press documented cases in which certain banks were expected to undertake acquisitions if Riegle Neal were to pass. For example, Hugh McColl, CEO of NationsBank, was one of the biggest proponents of

variables as proxies. Nonetheless, potential bidders are expected to be larger (in terms of size, deposits, branches, and employees) as well as more profitable and better capitalized.¹¹

Similar to Brook et al. (1998), I control for outliers by excluding ratios more than four standard deviations from the mean.¹² While returns can be segmented multiple ways, I start by examining above and below median. There is concern, however, there may not be a difference between the 309th and 310th firm and a test of medians may have low power. To test this, I examine the ends of the distribution including: first versus fourth quartile, fourth quartile versus all others, and tenth decile versus all others. In all cases results are qualitatively the same and in a few cases even stronger when examining 10th decile firms versus all others.

First, I examine differences in size measured by assets (log), deposits, branches, size of branches (assets / number of branches), and employees. Consistent with Billingsley and Lamy (1992) and Fraser et al. (1997), Table 8 details large firms (any measures) experience positive and significant returns. Except for branches size, small firm returns are not different from zero. For brevity, results from all five measures are not reported though all are similar. These results may differ from other studies (Brook et al., 1998) because those studies implement samples that are “skewed toward larger institutions” while this study examines all publicly traded banks.

Next, I examine differences in profitability (ROE and ROA) and ability to undertake acquisitions (capital ratios). Consistent with past studies, returns to low ROA firms are significantly positive (p-value 0.08); and thus, here, likely targets gain. High ROA returns,

the bill’s passage and made the bank’s future merger strategy abundantly clear (Cline, 1994). At least anecdotally, this provides evidence of the market’s ability to identify future bidders prior to Riegle Neal’s passage.

¹¹ See Brook et al. (1998) for an explanation why larger banks and those with larger branches, are likely bidders and Akhigbe, Madura, and Whyte (2004) and Carow and Heron (1998) for why firms that perform better and have high capital ratios are more likely bidders. All these measures are collected from SNL’s *DataSource*.

¹² As an alternative, I also Winsorized performance ratios at the 95th and 99th percentiles and run all analyses without adjustments to performance ratios. In all cases, results are qualitatively the same and available upon request.

however, are also significantly positive (p-value 0.03). Further, low ROE firms do not have significantly positive returns while high ROE firms do (p-value 0.02). Finally, for capital ratio (risk based capital to total assets), both low and high returns are significantly positive.¹³

The above analysis attempts to identify potential bidders *pre*-Riegle Neal based on individual factors such as size, efficiency, capital ratios. As an alternative, I create two indices based on if a firm has an above median value for various *ex-ante* measures. The first index (*overall*) takes a value of one for each *ex-ante* measure (assets, deposits, branches, branch size, employees, ROA, ROE, capital ratio, and equity capital ratio) in which the firm is above median. As there is considerable correlation among these measures (e.g., large firms are likely to have high deposits) a second index (*reduced*) is constructed with only three measures: one for size, profitability, and ability to acquire. Results from Table 8 demonstrate high index firms (either index) experience positive and significant returns, while low index firm returns (either index) are not insignificant. Further, examining high index firms all results from Tables 5 and 6 hold. Panel B demonstrates high index firms with branches in multiple states experience significantly larger returns than those in one state, while all geographic returns for low index firms are insignificant.

These results from all 619 public banks *pre*-Riegle Neal demonstrates, *ex-ante*, larger firms (assets, branches, etc.) experience significantly positive returns. Also, more profitable firms (ROE and ROA) and those with higher capital ratios perform *at least as well* as lower profitable (capitalized) ones. Both of these samples (large and higher profitable firms) have been shown to be proxies for likely bidders in merger negotiations. Amalgamating these measures into an index, high index firms (likely to become bidders) experience significantly positive returns while those firms in multiple states experience significantly positive (and larger) gains than those

¹³ Analysis is also conducted using equity capital as well as equity capital to total assets without changing results.

in only one state, but only for the high index portfolio. These results are consistent with analyses conducted on ex-post bidders and indicate the market, *ex-ante*, reacted favorable to those firms that were likely to become bidders post Riegle Neal and realize the largest cost savings.

Finally, even these ex-ante analyses may introduce some bias as examining firms above/below median values (or using quartiles, quintiles) may be arbitrary. To test this, I select every banking firm listed on the CRSP tapes from 1985 – 1993 (before Riegle Neal) and match them to 264 bank mergers announced and completed during this time. Hazard models are utilized to determining the likelihood of being a bidder in the decade prior to Riegle Neal. Similarly to the studies above, large firms, more profitable firms, and firms with more employees are more likely to be a bidder. Estimates from this model are then used to examine whether abnormal returns are related to the predicted probability of being a bidder. Results are in-line with analyses above and, once again, suggest future bidders gained significantly from Riegle Neal’s passage.

5. Confounding factors

5.1. Interest rates

It is possible other factors may contribute to returns found around Riegle Neal. Given the discount rate increased from 3% to over 4% at this time, it is plausible the reaction captured is a function of interest rate sensitivity, not Riegle Neal. Thus, regression equation #2 is repeated¹⁴, but is expanded to include change in daily interest rates in the following fashion:

$$R_{i,t} = \alpha + \beta_1 R_m + \beta_2 \Delta IR + \beta_3 D_1, \quad (3)$$

¹⁴Again, three estimation windows were tested (1, 1½, and 2 years). The results were quantitatively the same.

where R_i is the daily return for all firms in each portfolio, R_m is the daily value- or equal-weighted market index, Δ_{IR} is the change in 30-year interest rates¹⁵, and D_1 is a dummy variable equal to one when the legislation is before Congress and zero otherwise.

In addition, numerous studies have proposed certain measures that reflect Federal Reserve policy and thus serve as monetary policy indicators. Laurent (1988) and Bernanke and Blinder (1992) present evidence supporting the fed funds premium as an indicator of monetary policy actions because it is sensitive to shocks to bank reserves supply. The authors also advocate a term (maturity) premium, spread between long- and short-term rates. These indicators may be better measures of interest rate sensitivity than daily changes in Treasuries alone. Regression #3 is repeated using the federal funds premium (difference between daily federal funds rate, not seasonally adjusted, and daily three-month Treasury bill rate) and then the term premium (difference between daily ten- and one-year Treasury rates, constant maturities).¹⁶ Interest rate series are taken from the *Federal Reserve Statistical Release H.15, Selected Interest Rates*.

Table 9 reports returns for the various bank portfolios around the passage of Riegle Neal including interest rates. Panel A details the full sample effect. For returns calculated using a value-weighted market index, the coefficient of the dummy is 0.06% (p-value of 0.00). Over the entire 155-day legislative window, this daily return still translates into an 8.9% abnormal return.

Panel B shows the effects on various portfolios. *Bidder returns* are 0.11% (p-value 0.01). Again, this result provides evidence against the entrenchment or hubris hypotheses. Further, *Target returns* are 0.06% (p-value 0.14) and *Neither returns* are 0.05% (p-value 0.06). Replacing changes in daily 30-year treasuries with 1- or 10-year notes, federal funds premium, or term

¹⁵ Three interest rate maturities were used: one, ten, or thirty years. In all cases, results do not vary.

spread all produce qualitatively and quantitatively similar results (not shown) overall and for each portfolio. After controlling for changing interest rates, all banks experience significantly positive returns. Examining portfolios, each return is significantly positive except for targets.

Related, while a binary variable is included to control for changing interest rates, on March 22, 1994 the Federal Reserve's Open Market Committee (FOMC) surprised the market by increasing short-term interest rates less than had been anticipated. At this same time, the Federal Deposit Insurance Corporation (FDIC) revealed the Bank Insurance Fund was more solvent than expected, significantly reducing the assets it expected to acquire for five years. Finally, on March 22, 1994 Riegle Neal passed the full House and was introduced in the Senate. These positive 'surprise' announcements impacted returns as some banks' stock prices increased significantly that day (Matthews, 1994). It is possible gains may be attributed to these news releases and cannot be disentangled from the Houses' action. As a result, I rerun all analyses excluding March 22-23, 1994 without changing results; all statistical significances remain.

5.2. *Ex-ante measures*

It is possible positive returns to bidders in multiple states are driven by the fact that *any* bank with operations in multiple states could reduce costs post Riegle Neal by consolidating banks into branches of its headquarters. If so, these positive returns would not reflect potential synergistic merger gains, but cost savings from internal reorganization. Thus, I repeat analyses (similar to that in Table 9) segmenting *all* banks by the number of states they operate in pre-Riegle Neal. All banks in multiple states experience significantly positive returns during the

¹⁶ Another measure of rate sensitivity is the commercial paper (CP) premium; difference between monthly averages of the daily rates on six-month CP and T-bills, secondary market rate (Bernanke and Blinder, 1992). These data are not *both* available on a *daily* basis (either weekly or monthly) prior to 1997 for one-, three-, or six-month maturities.

deregulatory process and returns are significantly greater than banks in one state.¹⁷ Repeating this for *all non-bidders* provides similar results but the magnitude of these effects is significantly lower (~60%) than for bidders (Tables 5 and 7). While it appears the market valued a bank's ability to consolidate operations, it was not the only factor in deregulatory gains. Overall, firms that became bidders post Riegle Neal (and ex-ante likely bidders) experienced the largest gains.

Assets, number of branches, or deposits may also affect returns and segmenting firms by these measure may help distinguish the disciplinary and synergy hypotheses. All these variables, however, are highly correlated. A bank with operations in more than one state is likely to be large (assets and deposits) and have lots of branches; the opposite is true for those in one state. Pearson correlation coefficients (not shown) among branch location, deposits, assets, and number of branches are all above 0.70 (p-values < 0.001). Nonetheless, I rerun analyses using above and below median size, deposits, and branches¹⁸ without altering results. In contrast to some prior studies, it appears large interstate banks and future bidders benefit from Riegle Neal.

5.3. *Alternative interpretations*

Despite these robustness checks, it is still possible results are not due to synergistic gains. One interpretation could be market participants at the deregulatory event could not differentiate potential bidders and targets and rewarded all firms the same. As a result, I run tests (not shown) whether reaction estimates are statistically different for various portfolios. Bidder deregulatory gains (total returns and absolute or average dollar gains) are significantly larger than for the remaining portfolios. Further, returns for bidders in multiple states are significantly larger than

¹⁷ Again, results are the same if banks are segmented into one or two states versus three or more states.

¹⁸ Analysis is also run based on lowest vs. highest quartiles and interactions among variables. Results are the same: larger bidders (assets and deposits) and those with more branches have statistically significant returns during the passage of Riegle Neal while small bidders (and with few branches) do not.

for those in one state (also based on size, branches, and deposits). While all banks gained from Riegle Neal, subsequent bidders and those with operations in multiple states appear to have gained the most. These results provide further evidence gains from Riegle Neal cannot solely be attributable to the anticipation that some firms would be takeover targets post deregulation.

It is also possible results are driven by merger programs as the market anticipated future bidders based on past merger activity. Of the 65 bidders, all were a bidder in at least one public bank acquisition from 1980-1994 (on average four deals per bank not including acquisition of non-banks or private deals). Further, the number of states a bank operates in and number of mergers are highly correlated. Only a few banks with operations in one state undertook three or more mergers, while all but three bidders with branches in three or more states undertook two or more mergers during this period. For all firms, 482 (78%) were never a bidder and 49 (8%) were a bidder only once during this period. Less than 16% of these 482 firms were in two or more states (7% in more than 2 states). Alternatively, over 72% of the bidders undertook two or more deals from 1980-1994 while only 4% of all banks had two or more deals pre-Riegle Neal but were not a subsequent bidder. These results suggest bank acquisitions are concentrated among a few large banks and consistent with the notion that the market could more easily identify future bidders during the passage of Riegle Neal, reacting favorably to their expected takeovers.

Third, a state's regulatory status may drive returns. Pre-Riegle Neal, many states formed regional compacts where mergers were limited to firms in a member state. Other states enacted National Reciprocity legislation, which allowed any bank to acquire a bank in the home state if banks from the home state could do the same in the acquiring bank's state. A few others passed National Non-Reciprocity legislation, which did require a bank from the home state to be able to enter the acquiring bank's state. As a result, firms in regional compacts or nationwide legislation

states may have different motivations to merge and differing wealth effects. For the 65 bidders, 74% were in states that passed National Reciprocity or Non-Reciprocity legislation pre-Riegle Neal (including states part of regional compacts and passed nationwide legislation). All 15 firms in a regional compact (no nationwide legislation) were in states that opted-in early. In short, only two bidders were in states not part of a major regional compact or nationwide legislation. For all 619 banks, 75% were in states with National (Non-) Reciprocity pre-Riegle Neal, while nearly 20% of the remainder were in states that opted-in early. Just over 5% of all firms were in states not part of a major compact (or national legislation) and did not opt-in early. Thus, it is unlikely a state's regulatory status alone drove returns during the passage of Riegle Neal.

A fourth interpretation is positive bidder returns are not a result of synergy or anticipation, but merely firms with a large run-up in capitalization use their "overpriced" stock to acquire other firms. To test this hypothesis, I examine method of payment and bidder returns.¹⁹ Similar to other studies on bank mergers in the 1990s, I find a large majority of mergers use some degree of stock financing to complete a merger. Panel B of Table 4 details announcement and full event returns are not significantly different for bidders that use cash or stock. Moreover, returns during deregulatory period for bidders that subsequently use cash are not significantly different from those that use stock (all returns not significantly different from zero). Overall, it is possible the price run-up during the deregulatory period may drive a firm's decision to use cash or stock. However, deregulatory effects for bidders that use cash or stock are both positive and not significantly different. This suggests market valuation alone is not driving these results.

These results suggest while a host of factors (interest rates, internal reorganization, merger programs, regional compacts, market capitalization, etc.) could have played a role in the

market's reaction to the passage of Riegle Neal, overwhelmingly bidders overall (ex-post or ex-ante measures) and those bidders that potentially had the most to benefit (operations in multiple states) experienced the largest gains during the deregulatory process.

6. Summary of deregulation effects

Empirical research clearly documents merger returns to bidders around a narrow announcement window are, on average, non-positive. One interpretation of these non-positive bidder returns is that mergers are not wealth maximizing ventures and thus are motivated by entrenchment and/or hubris. An alternative interpretation, however, is that these returns are a function of methodological issues and that, as merger returns are anticipated, analysis of returns over a narrow window around the announcement date will not capture the full wealth effects.

To provide new estimates of anticipation components of bidder returns, I examine market reactions during the passage of a deregulatory act that explicitly enabled mergers as well as during subsequent merger announcements. Firms that are bidders post Riegle Neal experience large significant gains during its passage that translate into roughly \$24 billion in economic value. Moreover, the magnitude of the deregulatory returns to these bidders is significantly larger than the magnitude of the actual announcement returns. In particular, using a narrow event window around the merger announcement, bidders returns are negative and insignificant while returns over the entire event window are also insignificant. Thus, the overwhelming market reaction to these takeover bids occurs during the passage of the deregulatory event.

This research design also enables me to distinguish among the entrenchment, hubris, disciplinary, and synergy hypotheses. The overall positive returns to bidders provide evidence

¹⁹ Method of payment is separated by 100% cash vs. 100% stock *plus* stock and other means combined (debt, cash,

against both the entrenchment and hubris hypotheses. Segmenting by geographic branching, bidders in multiple states have significantly larger gains than those in one state. Given multiple-state bidders experience significantly greater returns (controlling for size) suggests mergers are motivated by synergy rather than disciplinary motives. These results hold whether I test these effects on *actual* (determined ex-post) or *expected* (determined ex-ante) merger participants.

Furthermore, these results may provide a way to rectify the apparent contradiction between event and cost study analyses. In particular, while most analyses document bank mergers lower costs at least to some degree (Houston, James, and Ryngaert, 2001); inexplicably announcement period returns suggests bidders do not gain. By investigating anticipation components of bidder returns, this analysis suggests bidder do gain and that these positive returns are anticipated. Future work could more directly test whether the anticipation returns to bidder firms are correlated with subsequent cost savings.

etc.). Analysis is also conducted comparing 100% cash vs. 100% stock. All results are qualitatively similar.

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Appendix A – Deregulation Background

A.1. Implementation of the 30-mile rule

As noted in Section I, the 30-mile rule is often considered the last impetus to removing branching restrictions in the U.S. In particular, by the 1990s, a few national banks sought to use this rule to circumvent interstate restrictions and consolidation operations across state lines. One such bank was NationsBank [NB] (now Bank of America), a multi-bank holding company (MBHC). Banks in more than one state were required to have separate chartered entities with distinct board of directors. This proved costly for MBHCs (NB estimated it could save millions consolidating its banks in 11 states). In an attempt to decrease these costs, NB DC applied to move its headquarters 7 miles to Maryland and keep the DC branches open. The Office of the Comptroller of the Currency (OCC) granted this request as the 30-mile rule did not require banks to close these branches.²⁰ By then, most states allowed two banks of the same firm in the same state to merge without approval. NB DC (now headquartered in Maryland) merged with NB MD.

NationsBank then moved NB MD's headquarters into Virginia, merged the two (MD and VA), and created NB of the Capitol Area. It also moved NB SC into North Carolina, merged the two (SC and NC), and formed NB of Carolinas. NationsBank now had two banks serving the 5-state area. Finally, it asked to move NB of the Capitol Area into North Carolina, merge the two and have one bank serving all five states. At this point, other national banks were applying for similar rulings. The OCC asked all banks to wait for Congress to pass national legislation.

Note in using the 30-mile rule to circumvent interstate restrictions, NationsBank did not branch into states where it did not have operations. While the OCC allowed consolidation across

²⁰ While D.C. is not legally a state, with interstate branching restrictions it was treated as such and banks branching in or out of the District were subject to the same restrictions as branching from any other state.

state lines, it did not allow banks into states where they were not already allowed by regional or national reciprocity. Shortly after the OCC's rulings, Congress began drafting interstate banking and branching legislation that would apply to all banks in all states, rather than a select few.

A.2. Riegle Neal Act of 1994

Riegle Neal was not the first attempt to repeal interstate restrictions. In the preceding years, numerous efforts had been made (see Table 1). On September 29, 1994 Riegle Neal was signed, overturning provisions of McFadden Act of 1927 and Douglas Amendment to BHC Act (1956) which forced BHCs to receive permission from each affected state before acquiring an out-of-state bank. In particular, Riegle Neal allowed the following.

Interstate acquisition: As of September 29, 1995, any BHC could acquire a bank anywhere in the U.S. In acquiring out-of-state banks, bidders were allowed to take deposits/process transactions across state lines. This phase superseded restrictive covenants of 36 states that allowed interstate banking only on a regional or reciprocal basis. However, certain constraints were imposed, including: mergers could be blocked if concentration ratios were greater than 10% (30%) of U.S. (state) deposits. States could adjust the limit as long as changes were uniform. States could restrict acquisitions to banks in existence up to five years. Acquisitions were subject to reinvestment laws. If a bank did not lend at least 50% of the average loan rate for the state, it could face intervention (unless involved a bank near or in default). States, however, could *not* opt out of interstate banking; as of 1995, it was the law.

Interstate branching: As of June 1, 1997, banks could merge operations across state lines, turning out-of-state banks into interstate branches of the main bank. In general, all limitations described above applied to interstate branching. The notable difference was the ability to opt-out.

Special provisions: Each state was allowed to opt in or out of the *branching* component only. States had until June 1, 1997 to decide; otherwise interstate branching was allowed. By 1997, Texas and Montana opted out.²¹ These states could not keep a bank out; they could only require banks to form as a separate entity or limit size. By the end of 1996, nineteen states (plus D.C.) opted-in early, including: Alabama, Connecticut, Delaware, Florida, Georgia, Idaho, Illinois, Maryland, Nevada, New Hampshire, North Carolina, North Dakota, Oregon, Pennsylvania, Rhode Island, South Carolina, Tennessee, Utah, and Virginia. Minnesota opted-in but restricted access, and Missouri only made exemptions for banks within 30 miles its border.

De novo branching: Federal law prohibited out-of-state banks from entering a state by opening a new bank if it did not already have branches. This remained illegal unless allowed. By 1996, eight states passed such law (Connecticut, Maryland, Nevada, North Carolina, Oregon, Pennsylvania, Rhode Island, and Virginia). Partial acquisitions were permitted only if a state enabled it. By 1996, these same eight states permitted partial acquisitions, plus Utah and Alabama (in limited circumstances). Not directly related to geographic branching, Riegle Neal also allowed *agency relationships* where an affiliate in one state could act as an agent for a bank in another state and undertake transactions. Banks could accept deposits, renew time deposits, service loans, receive payments, and close loans. However, this relationship did not permit banks to originate new deposit accounts, disperse loans, or evaluate loan applications.

²¹ Although Texas opted out, NationsBank still tried to merge banks in Texas and Oklahoma via the 30-mile rule. Texas sued and the courts ruled the 30-mile rule was ineffective after June 1, 1997 (thwarting NationsBank attempt). In 1999 Texas opted back in to interstate branching and Montana also opted back in a year later in 2000.

Table 1
Time Line of Legislation Affecting Interstate Banking and Branching

This table highlights legislation affecting interstate banking and branching in the United States. Panel A details legislation over from 1963 to 1990 while Panel B highlights legislation on interstate banking and branching in the House of Representatives and the Senate from Congressional documents and hearings in the 1990s. BHC equals Bank Holding Company, SBC equals Senate Banking Committee, and HBC equals House Banking Committee.

Date	Legislative Event	Outcome (if any)
1863	National Banking Act	States can impose branching restrictions
1866	30-Mile Rule	NBs can move HQs up to 30-miles
1927	McFadden Act	National banks subject to state branching laws
1934	Federal Deposit Insurance Corp.	Creation of insured deposits
1956	Douglas Amendment to BHC Act	BHCs subject to state branching laws
1968	Williams Act	Bidder disclosure requirements
1970	Amendment to the BHC Act (1956)	One BHCs subject to state branching laws
1985	IBA of NY vs. Marine Midlands Bank	ATMs not owned by banks are not branches
1983 – 1990	Northeast, Southeast, and Midwest Compacts	Formation of regional compacts

Panel B: Time Line of Interstate Banking and Branching Legislation from House and Senate

2-26-1991	Treasury presents interstate bill	
3-20-1991	Senate hearings	
8-2-1991	SBC votes to send to full Senate	Vote approved
11-21-1991	Vote by full Senate	Vote approved
Fall, 1991	Vote by full House	House fails to approve Senate version
2-16-1993	Senate - Interstate Banking & Branching Act	
4-28-1993	Senate - Interstate Banking Act	
5-20-1993	House - Amendment to BHC Act (1956) to allow interstate banking	
6-22 to 10-26-1993	House hearings	
10-5 & 11-3-1993	Senate hearings	Based on legislation from 1991
2-1-1994	Subcommittee votes to send to HBC	Unanimously passes Subcommittee
2-23-1994	SBC votes to send to full Senate	Unanimously passes SBC
3-9-1994	HBC votes to send to full House	Passes 50-1 in HBC
3-22-1994	Vote by full House, sent to Senate	2/3rds present vote for bill
4-26-1994	Vote by full Senate	Passes, requests Conference Committee
5-9-1994	Conference Committee creation	Senate appoints Conference Committee
5-12-1994	House defeats Senate version	House agrees to Conference Committee
8-4-1994	House Conference Committee report	Passes by voice vote
9-13-1994	Senate Conference Committee report	Passes by voice vote
9-30-1994	Bill sent to President Clinton	President signs bill into law

Table 2
Comparison of Event Studies in Recent Research on Deregulation in the Banking Industry

This table provides an overview of the results of event studies on the deregulation of the banking industry through earlier deregulatory studies as well as the Riegle Neal Interstate Banking and Branching Efficiency Act of 1994 (Riegle Neal). Authors, Deregulation Event, Time Period, Sample Size, Takeover Proxies, Gains (Gainers), Results, and Interpretations are all variables taken from the original studies.

Prior Deregulatory Studies								
No.	Authors	Deregulation Event	Time Period	Sample Size	Takeover Proxies	Gains (Gainers)	Results	Interpretations
1	Black, Fields, and Schweitzer (1990)	State interstate banking legislation	6-1982 to 9-1986	13 money centers; 38 superregionals	None	Mixed: superregionals	No significant effect (3.8%); negative for money centers (-6%), positive for superregionals (6.7%)	Interstate legislation will strain money centers, help superregionals
2	Billingsley and Lamy (1992)	Supreme Court rulings on regional reciprocity	1985 (June 10 decision)	52 BHCs in regional compacts; 107 BHCs not in compacts	Absolute size; relative size within compact and state	Mixed: small in-state or absolutely large	Small banks in-state or in-compact gain; absolutely larger banks also gain	Small gain due to probability of takeover; absolute large gain due to ability to exploit changes in law
3	Fraser, Hooton, Kolari, and Reising (1997)	Interstate branching for S&Ls	12-1991, 1992, & 1992	4- 38 S&Ls 5- 88 commercial banks	Size	Mixed: large firms	Positive returns up to 5.5% for large firms no effect for small firms (-0.2% to 0.5%)	Large S&Ls and banks gain most due to lower costs, stable profits, larger market values
4	Goldberg, Hanweck, and Sugrue (1992)	State interstate banking Legislation	2-1-1982 to 9-1-87	131 banks	In vs. out of state; in vs. out of region; plus money centers	Mixed: out-of-state (region) banks	Money centers -7.8%; out-of-state (region) 4.9% (4.3%); in-state banks gain less	Banks positively affected by interstate laws due to increased expansion opportunities
5	Carow and Lee (1997)	Riegle Neal, state interstate banking legislation	7-1982 to 4-1993	271 banks	Acquisitions after passage, "firm characteristics"	Mixed (Non-money center banks)	Money center banks -3.7% returns	Positive returns related to the probability of later being acquired
6	Carow and Heron (1998)	Riegle Neal	1994 to 1995	90 interstate & 90 non-interstate BHCs	ROA; adjusted capital ratios; Size	Yes (Targets, non-interstate BHCs)	Returns of 2.2%; target and non-interstate BHCs earn higher gains	Returns related to deregulation, likely targets experience greatest short-term gains
7	Brook, Hendershott, and Lee (1998)	Riegle Neal	6-31-1993	290 public banks	Q-ratios, ROE, log of assets, branch size; 44 acquired banks	Yes (All banks)	1.9% around passage; Post-acquired banks earn 16.7% vs. 13.7% for all banks	Total value increase of \$85 billion for banking industry; poor-performing banks increase most due to takeover discipline

Table 3
Stock Return Effect on Portfolios of Banks around the Passage of Riegle Neal

This table shows the stock return effect on various bank portfolios around the passage of Riegle Neal on September 29, 1994. Panel A shows the effect on all 619 banks and bank holding companies from the CRSP tapes in existence after September 29, 1994. Panel B shows the stock effects on portfolios comprised of targets, bidders, both targets and bidders, and neither targets nor bidders. *Targets* are 114 firms that are acquired after September 29, 1994. *Bidders* are the 65 firms that takeover targets. *Both firms* are 12 firms that are both bidders and targets. *Neither firms* are 428 firms that are neither a bidder nor a target post Riegle Neal. Overall, the daily returns for all firms in each portfolio (R_i) are regressed on a value- and equal-weighted index (R_m) and a dummy variable (D_1). The estimation window is from July 1, 1993 to December 31, 1994. The dummy variable takes a value of one as Riegle Neal legislation passes through Congress (February 1 to September 13, 1994), zero otherwise. P-values are in parenthesis.

Model: $R_i = \alpha + \beta_1 R_m + \beta_2 D_1$				
Portfolio	α	β	Dummy	Adj. R ²
Panel A: All banks				
Value-weighted	-0.00055 (0.09)	0.94419 (0.00)	0.00103 (0.04)	0.5217
Equal-weighted	0.00014 (0.42)	0.62174 (0.00)	0.00064 (0.02)	0.5406
Panel B: Portfolios of banks				
<i>Bidder firms</i>				
Value-weighted	-0.00090 (0.02)	1.01986 (0.00)	0.00151 (0.02)	0.4532
Equal-weighted	-0.00092 (0.00)	0.77744 (0.00)	0.00118 (0.01)	0.4432
<i>Target firms</i>				
Value-weighted	-0.00027 (0.4430)	0.79714 (0.00)	0.00109 (0.05)	0.3863
Equal-weighted	0.00039 (0.14)	0.58118 (0.00)	0.00060 (0.14)	0.3185
<i>Both firms</i>				
Value-weighted	-0.00031 (0.54)	1.09928 (0.00)	0.00063 (0.43)	0.3681
Equal-weighted	-0.00096 (0.04)	0.93270 (0.00)	0.00097 (0.17)	0.2822
<i>Neither firms</i>				
Value-weighted	-0.00043 (0.15)	0.87931 (0.00)	0.00092 (0.05)	0.5174
Equal-weighted	0.00015 (0.43)	0.62831 (0.00)	0.00064 (0.03)	0.5194

Table 4
Bidder Merger Returns

This table details stock market reaction to merger activity announced after the passage of the Riegle Neal Act on September 29, 1994 but completed prior to December 31, 1996. Panel A details deregulatory, announcement, and announcement to end date returns for 65 bidders around 114 mergers, while Panel B details returns segmented by method of payment. The number of cash and stock mergers is greater than 65 because 3 bidders undertook both a cash and stock merger during the period. Deregulatory returns are calculated as daily returns for the bidder portfolio and regressed on a value-weighted index and a dummy variable. The estimation window is from July 1, 1993 to December 31, 1994. The dummy variable takes a value of one as Riegle Neal legislation passes through Congress, zero otherwise. Overall deregulatory bidder return is calculated from the coefficients of the dummy variable and compounded over the entire 155-day event window. Announcement returns are calculated using geometric cumulative abnormal returns over a 36-day event window (-30, +5) around the announcement. The *CRSP* value-weighted index (with distributions) is used to calculate abnormal returns. Announcement to end date returns are calculated using buy-and-hold abnormal returns (Barber and Lyon, 1997). Change in value is the market value of each portfolio (\$ billion) times overall returns. Median returns are in parenthesis. P-values for means are from tests if returns are significantly different from zero. For medians, p-values are based on the Wilcoxon signed rank test to indicate if median value is statistically different from zero. Difference in returns for means are p-values of the t-test measuring difference in returns and for medians, the Wilcoxon signed rank test used to indicate if median values are statistically different.

Panel A	N	Return	p-value	Δ Value (Billions)
Deregulatory Returns	65	26.31%	0.01	\$23.84
Announcement Returns	65	-0.61% (-0.17%)	0.41 [0.91]	-\$0.54
Announcement to End	65	2.47% (0.26%)	0.21 [0.81]	\$2.25
Panel B	N	Return	p-value	Diff. in Returns
Deregulatory Returns				
Cash mergers	7	6.27%	0.55	0.32
Stock mergers	59	19.32%	0.01	
Announcement Returns				
Cash mergers	9	-1.38% (-2.16%)	0.51 [0.45]	0.75 [0.68]
Stock mergers	105	-0.54% (0.00%)	0.50 [1.00]	
Announcement to End				
Cash mergers	9	-4.69% (-0.85%)	0.26 [0.72]	0.25 [0.15]
Stock mergers	105	3.19% (1.00%)	0.14 [0.40]	

Table 5
Stock Return Effect on Bidder Firms Based on Geographic Branching

This table details the stock return effect on bidders based on geographic branching. Panel A shows the effect on *bidder* portfolio by geographic branching around the passage of the Riegle Neal bill on September 29, 1994. Panel B details deregulatory and announcement returns for bidders segmented by geographic branching. *Bidder firms* are the 65 public banks that acquire 114 targets after September 29, 1994. Geographic branching designates the number of states the bidder has branches in prior to the estimation window. *One state* are 32 bidders with branches in only one state while *Multiple states* are the 33 with branches in two or more states. Similarly, geographic branching is segmented into bidders in one or two states (43 firms) versus three or more states (22 firms). Daily returns for one and multiple state portfolios (R_i) are regressed on a value-weighted index (R_m) and a dummy variable (D_1). The estimation window is from July 1, 1993 to December 31, 1994. The dummy variable takes the value of one as Riegle Neal legislation passes through Congress (February 1 to September 13, 1994) and zero otherwise. Deregulatory return is calculated from the coefficients of the dummy variable and compounded over the entire 155-day event window. Announcement returns are calculated using geometric cumulative abnormal returns over a 36-day event window (-30, +5) around the announcement. The CRSP value-weighted index (with distributions) is used to calculate abnormal returns. Median returns are in parenthesis. P-values for means are from tests if returns are significantly different from zero. For medians, p-values are based on the Wilcoxon signed rank test to indicate if median value is statistically different from zero. Difference in returns for means are p-values of the t-test measuring difference in returns and for medians, the Wilcoxon signed rank test used to indicate if median values are statistically different.

Panel A: Deregulatory Bidder Portfolio	α	β	Dummy	Adj. R²
Model: $R_i = \alpha + \beta_1 R_m + \beta_2 D_1$				
One state	-0.00024 (0.39)	0.83911 (0.00)	0.00055 (0.47)	0.2726
Multiple states	0.00120 (0.00)	0.86412 (0.00)	0.00189 (0.02)	0.4678
One or two states	0.00035 (0.15)	0.68802 (0.00)	0.00139 (0.32)	0.3074
Three or more states	-0.00119 (0.00)	0.80464 (0.00)	0.00207 (0.03)	0.3472
Panel B: Returns	N	Return	p-value	Diff. in Returns
Deregulatory Returns				
One state	32	8.90%	0.85	0.01
Multiple states	33	34.07%	0.01	
Announcement Returns				
One state	47	-1.01% (-0.34%)	0.30 [1.00]	0.52
Multiple states	67	-0.04% (0.00%)	0.97 [1.00]	[0.50]

Table 6
Effect on Bidder Firms Based on Adoption of Interstate Branching Component

This table details the stock return effect on bidders based on the adoption date of the interstate *branching* component of the Riegle Neal bill on September 29, 1994 and on geographic branching. Panel A shows the effect based on the adoption date and Panel B the intersection of geographic branching and adoption date of the interstate *branching* component. *Bidder firms* are the 65 public banks that acquire 114 targets after September 29, 1994. Geographic branching designates the number of states the bidder has branches in prior to the estimation window. *One state* are the 32 bidders with branches in only one state while *Multiple states* are the 33 with branches in two or more states. Similarly, there are 43 bidders in one or two states versus 22 bidders in three or more. *Opt-in early states* are the 33 banks headquartered in a state that opted into the interstate branching component early while *On schedule states* are the 32 that did not opt in early (but did not opt out either). *Opt in/one [multi] states* are the 13 [20] bidders headquartered in a state that opted in early *and* operate branches in one [two or more] state, while *On schedule/one [multi] states* are the 19 [13] in states that did not adopt early *and* operate branches in one [two or more] state. Overall, the daily returns for all firms in each portfolio (R_i) are regressed on a value-weighted index (R_m) and a dummy variable (D_1). The estimation window is from July 1, 1993 to December 31, 1994. The dummy variable takes the value of one as Riegle Neal legislation passes through Congress (February 1 to September 13, 1994) and zero otherwise. P-values are reported in parenthesis.

Model: $R_i = \alpha + \beta_1 R_m + \beta_2 D_1$				
Bidder Portfolio	α	β	Dummy	Adj. R²
Panel A: Stock return effect, adoption of interstate branching component				
Opt in early states	-0.00035 (0.24)	0.67670 (0.00)	0.00117 (0.02)	0.3955
On schedule states	-0.00003 (0.93)	0.71960 (0.00)	0.00079 (0.08)	0.4323
Panel B: Stock return effect, adoption of interstate branching component and geographic branching				
Opt in/one state	0.00049 (0.35)	0.47727 (0.00)	0.00012 (0.88)	0.1006
Opt in/multi states	-0.00077 (0.02)	0.77910 (0.00)	0.00155 (0.00)	0.4166
On schedule/one state	0.00032 (0.39)	0.66209 (0.00)	0.00060 (0.32)	0.2723
On schedule/multi states	-0.00041 (0.22)	0.78282 (0.00)	0.00099 (0.08)	0.4027

Table 7
Change in Dollar Value Effects around the Passage of Riegle Neal

This table details the change in dollar value for various bank portfolios around the passage of the Riegle Neal bill on September 29, 1994. Panel A details changes for all firms, targets, bidders, both targets and bidders, and neither targets nor bidders. *All firms* are the 619 banks and bank holding companies from the CRSP tapes in existence after September 29, 1994. *Target firms* are 114 firms that are acquired after September 29, 1994. *Bidder firms* are the 65 firms that takeover the targets. *Both firms* are 12 firms that are first targets and then bidders themselves. *Neither firms* are 428 firms that are neither a bidder nor a target after September 29, 1994. Panels B and C details changes based on bidder firms based on their geographic branching as well as on the adoption date of the interstate *branching* component around the passage of Riegle Neal, respectively. Geographic branching designates the number of states the bidder has branches in prior to the estimation window. *One state* are the 32 bidders with branches in only one state while *Multiple states* are the 33 with branches in two or more states. *Opt-in early states* are the 33 banks headquartered in a state that opted into the interstate branching component early while *On schedule states* are the 32 banks headquartered in a state that did not opt in early (but did not opt out either). Each portfolio is regressed on a value-weighted index and a dummy variable. The estimation window is from July 1, 1993 to December 31, 1994. The dummy variable takes the value of one as Riegle Neal passes through Congress (February 1 to September 13, 1994) and zero otherwise. Market value is the total market value of equity of all firms (dollar billions) in each portfolio prior to the deregulation period. Overall returns are calculated from the coefficients of the dummy variable and compounded over the entire 155-day window. Change in value is portfolio market value (dollar billion) times overall returns.

Portfolio	No. of Firms	Coefficient on Dummy Variable	Market Value (\$ billion)	Overall Returns	Change in Value (\$ billion)	Average Gain (\$ million)
Panel A: Change in dollar value for portfolios						
All firms	619	0.103%	287.63	17.34%	49.87	80.55
Bidder firms	65	0.151%	90.56	26.31%	23.84	366.70
Target firms	114	0.109%	17.16	18.40%	3.16	27.80
Both firms	12	0.063%	27.65	10.31%	2.85	237.50
Neither firms	428	0.092%	139.55	15.28%	21.34	49.86
Panel B: Change in bidder dollar value based on geographic banking						
One state	32	0.055%	10.55	8.90%	0.95	29.69
Multiple states	33	0.189%	80.01	34.07%	27.26	826.06
Panel C: Change in bidder dollar value, adoption of interstate branching component						
Opt in early states	33	0.117%	52.98	19.87%	10.53	319.09
On schedule states	32	0.079%	37.57	13.02%	4.89	152.81

Table 8
Stock Return Effect on Ex-Ante Portfolios of Banks around the Passage of Riegle Neal

This table details stock return effect on various *ex-ante* bank portfolios around Riegle Neal's passage. To examine differences in size: log assets, deposits, number of branches, branch size (total assets/# of branches), and employees are segmented into above and below medians. Small (large) firms are those with below (above) median values. For profitability: Return on Assets (ROA) and Equity (ROE) are split into above and below median. Low (high) profitability firms are those with below (above) median values. Above and below median capital ratios are used to determine a firm's ability to undertake acquisitions. Two indices are created based on if a firm has an above median value for these ex-ante measures. For the first index (*overall*), a firm is given a value of one for each of nine ex-ante measures in which it has an above median value. The second (*reduced*) is constructed using three measures (one for size, profitability, and ability to acquire). The indices are segmented into above and below median. *Panel B* segments low (high) index portfolios by geographic branching, designated by the number of states a bidder has branches in pre-estimation window. *One state* are the firms with branches in one state while *Multiple states* are the firms with branches in two or more states. Overall, daily returns for each portfolio (R_i) are regressed on a value-weighted index (R_m) and a dummy variable (D_1). The estimation window is from July 1, 1993 to December 31, 1994. The dummy variable takes a value of one as Riegle Neal legislation passes through Congress (February 1 to September 13, 1994) and zero otherwise. P-values are in parenthesis.

Model: $R_i = \alpha + \beta_1 R_m + \beta_3 D_1$				
Portfolio	α	β	Dummy	Adj. R ²
<i>Firm Size</i>				
Small assets	0.00083 (0.00)	0.55274 (0.00)	0.00037 (0.33)	0.3281
Large assets	-0.00049 (0.01)	0.68305 (0.00)	0.00088 (0.00)	0.5261
Small deposits	0.00082 (0.00)	0.55744 (0.00)	0.00036 (0.34)	0.3337
High deposits	-0.00049 (0.01)	0.67907 (0.00)	0.00089 (0.00)	0.5228
Low branches	0.00061 (0.01)	0.59809 (0.00)	0.00055 (0.12)	0.3961
High branches	-0.00037 (0.08)	0.64110 (0.00)	0.00073 (0.02)	0.4819
<i>Profitability</i>				
Low ROA	0.00042 (0.08)	0.66285 (0.00)	0.00063 (0.08)	0.4311
High ROA	-0.00009 (0.62)	0.57789 (0.00)	0.00066 (0.03)	0.4452
Low ROE	0.00045 (0.06)	0.61381 (0.01)	0.00057 (0.11)	0.3930
High ROE	-0.00013 (0.51)	0.62165 (0.00)	0.00071 (0.02)	0.4767

Table 8 (continued)
Stock Return Effect on Ex-Ante Portfolios of Banks around the Passage of Riegle Neal

This table details stock return effect on various *ex-ante* bank portfolios around Riegle Neal's passage. To examine differences in size: log assets, deposits, number of branches, branch size (total assets/# of branches), and employees are segmented into above and below medians. Small (large) firms are those with below (above) median values. For profitability: Return on Assets (ROA) and Equity (ROE) are split into above and below median. Low (high) profitability firms are those with below (above) median values. Above and below median capital ratios are used to determine a firm's ability to undertake acquisitions. Two indices are created based on if a firm has an above median value for these ex-ante measures. For the first index (*overall*), a firm is given a value of one for each of nine ex-ante measures in which it has an above median value. The second (*reduced*) is constructed using three measures (one for size, profitability, and ability to acquire). The indices are segmented into above and below median. *Panel B* segments low (high) index portfolios by geographic branching, designated by the number of states a bidder has branches in pre-estimation window. *One state* are the firms with branches in one state while *Multiple states* are the firms with branches in two or more states. Overall, daily returns for each portfolio (R_i) are regressed on a value-weighted index (R_m) and a dummy variable (D_1). The estimation window is from July 1, 1993 to December 31, 1994. The dummy variable takes a value of one as Riegle Neal legislation passes through Congress (February 1 to September 13, 1994) and zero otherwise. P-values are in parenthesis.

Portfolio	Model: $R_i = \alpha + \beta_1 R_m + \beta_2 D_1$			Adj. R ²
	α	β	Dummy	
<i>Ability to Acquire</i>				
Low capital ratio	0.00023 (0.35)	0.68744 (0.00)	0.00079 (0.04)	0.4390
High capital ratio	0.00006 (0.74)	0.55466 (0.00)	0.00057 (0.07)	
<i>Index Values</i>				
Low overall index	0.00123 (0.00)	0.34922 (0.00)	0.00021 (0.58)	0.1943
High overall index	-0.00052 (0.01)	0.66577 (0.00)	0.00085 (0.01)	0.4987
Low reduced index	0.00094 (0.00)	0.39502 (0.00)	0.00035 (0.32)	0.2729
High reduced index	-0.00041 (0.06)	0.63462 (0.00)	0.00073 (0.03)	0.4497
<i>Panel B: Index portfolios by geographic branching</i>				
High Index – One state	-0.00010 (0.69)	0.62170 (0.00)	0.00061 (0.13)	0.3487
High Index – Multiple	-0.00049 (0.00)	0.70961 (0.00)	0.00108 (0.01)	0.4322
Low Index – One state	0.00076 (0.00)	0.56456 (0.00)	0.00042 (0.25)	0.3518
Low Index – Multiple	-0.00032 (0.43)	0.72767 (0.00)	0.00080 (0.20)	0.2359

Table 9
Stock Return Effect on Portfolios of Banks around the Passage of Riegle Neal

This table shows the stock return effect on various bank portfolios around the passage of Riegle Neal on September 29, 1994. Panel A shows the effect on all 619 banking firms from the *CRSP* tapes in existence after September 29, 1994. Panel B shows the stock effects on portfolios comprised of targets, bidders, both targets and bidders, and neither targets nor bidders. *Targets* are 114 firms acquired after September 29, 1994. *Bidders* are the 65 firms that takeover the targets. *Both firms* are 12 firms that are both bidders and targets. *Neither firms* are 428 firms that are neither a bidder nor a target. Overall, the daily returns for all firms in each portfolio (R_i) is regressed on an equal- and value-weighted index (R_m), the change in 30-year interest rates (Δ_{IR}), and a dummy variable (D_1). The estimation window is from July 1, 1993 to December 31, 1994. The dummy variable takes the value of one as Riegle Neal legislation passes through Congress (February 1 to September 13, 1994) and zero otherwise. P-values are in parenthesis.

Model: $R_i = \alpha + \beta_1 R_m + \beta_2 \Delta_{IR} + \beta_3 D_1$					
Portfolio	α	β_1 - Mkt	β_2 - IRs	Dummy	Adj. R ²
Panel A: All banks					
Value-weighted	0.00025 (0.12)	0.636809 (0.0001)	-0.00341 (0.18)	0.00055 (0.05)	0.5039
Equal-weighted	0.00102 (0.00)	0.421139 (0.0001)	-0.00074 (0.82)	0.00013 (0.70)	0.3114
Panel B: Portfolios of banks					
<i>Bidder firms</i>					
Value-weighted	-0.00072 (0.01)	0.77504 (0.0001)	-0.01658 (0.0001)	0.00114 (0.011)	0.4119
Equal-weighted	0.00017 (0.48)	0.73521 (0.00)	-0.00204 (0.63)	0.00059 (0.172)	0.4488
<i>Target firms</i>					
Value-weighted	0.00040 (0.08)	0.6098 (0.0001)	-0.00256 (0.49)	0.00060 (0.14)	0.3053
Equal-weighted	0.00114 (0.00)	0.40230 (0.00)	-0.00004 (0.99)	0.00019 (0.66)	0.1858
<i>Both firms</i>					
Value-weighted	-0.00104 (0.014)	0.92329 (0.00)	-0.02962 (0.00)	0.00133 (0.073)	0.2918
Equal-weighted	-0.00001 (0.98)	1.01869 (0.00)	-0.00505 (0.46)	0.00066 (0.34)	0.3877
<i>Neither firms</i>					
Value-weighted	0.00025 (0.14)	0.64907 (0.00)	-0.00187 (0.48)	0.00055 (0.06)	0.4844
Equal-weighted	0.00104 (0.00)	0.41288 (0.00)	0.00019 (0.95)	0.00012 (0.74)	0.2766