

The valuation effects of bank mergers

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Abstract

This paper examines the valuation effects of a sample of 558 bank mergers from 1980–1997. The overall results indicate that bank mergers create wealth. On average over a 36-day (–30, +5) event window, targets gain over 22%, bidders break even, and combined firms gain 3%. The results further indicate that mergers in the 1990s, which have not been extensively studied in prior work, have positive effects. In the 1990s over the 36-day window: target gain significantly, bidder returns are positive and statistically larger than the mid-1980s, and combined firm returns are significantly positive. These results are consistent with the notion that bank mergers occur for synergistic reasons and are not the result of empire building. However, bidder returns are sensitive to the event window implemented. Examining returns over an 11-day (–5, +5) window, target returns remain significantly positive, while bidder returns are statistically negative, and combined firm returns are statistically positive. Results over both windows indicate that overall wealth effects from bank mergers are positive over time, particularly in the 1990s. © 2000 Elsevier Science B.V. All rights reserved.

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1. Introduction

This paper studies the valuation effects of mergers and acquisitions in the banking industry for the 1980–1997 period. The research is motivated by the significant increase in merger activity that has accompanied the widespread

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deregulation in the banking industry. Specifically, the number of bank mergers in the 1990s has increased 215% from the early 1980s. Moreover, bank merger activity has nearly doubled from 8% of all public mergers in the early 1980s, to over 15% in the first 8 years of the 1990s. This increase in merger activity is consistent with analysis of Jensen (1993), Mitchell and Mulherin (1996), and Weston et al. (1998) who document that industry changes induced by such factors as deregulation (among others) have led to increased merger activity.

Deregulation in the banking industry sets up a natural experiment to test two distinct merger theories: synergy vs. hubris. If mergers have enabled synergies previously prohibited by regulation, then one would expect the more recent mergers to add to target, bidder and combined firm shareholder wealth. By contrast, if the more recent mergers are an example of hubris and empire building, then one would expect that while target shareholders may gain, bidder shareholders should experience a decline in wealth and shareholders of the combined firm should not experience overall gains.

Much of the prior work on bank mergers has focused on relatively short time periods of 5-year intervals in the mid- to late 1980s with small samples (Cornett and De, 1991 — 153 acquisitions; Neely, 1987 — 26 acquisitions; Trifts and Scanlon, 1987 — 21 acquisitions; and Houston and Ryngaert, 1994, 1997 — 196 and 212 acquisitions, respectively). This paper extends the prior research by comparing mergers over an extended period of time (1980–1997) for a large data set of 558 bank mergers. This larger sample size allows for a broader test of the two competing bank merger hypotheses. Moreover, by including the 1990s, we can more completely address the question of what are the returns from bank mergers. Including the earlier years in this analysis provides a benchmark for studying these effects in the 1990s.

My results demonstrate that bank mergers create wealth over the 1980–1997 period. Moreover, returns in the early 1980s and 1990s are the most supportive of this notion of wealth creation. The magnitude of any valuation, however, is sensitive to the length of the event window employed. For targets, returns are significantly positive regardless of the methodology or time period studied over both a 36-day (–30, +5) and 11-day (–5, +5) event window around the initial merger announcement date. For bidders, returns are highly dependent on the choice of event window ranging from statistically negative to insignificantly positive. For combined firms, cumulative abnormal returns are significantly positive across time using either event window.

Finally, this paper attempts to address why we observe the type of patterns in intertemporal returns. It is possible that the positive wealth effects are merely a function of the changing aspects of the mergers. As a result, this paper provides cross-sectional sensitivity analysis to address these patterns and ensure that the results for the 1990s are robust. Patterns in intertemporal returns may be due to, among others, changes in terms of payment, competitiveness of takeover bidding, overlap in operations, or management team incentives. Results indicate that such

factors as method of payment and number of bids per acquisition alone cannot account for the variation in returns over time, while the geographic location of merger participants may be related to overall returns.

The remainder of this paper proceeds as follows: Section 2 reviews the literature on bank mergers. Section 3 describes the data and descriptive statistics on the bank merger sample. Section 4 reports the event study analysis and results. Section 5 provides cross-sectional sensitivity analysis. Section 6 summarizes and provides some implications of the findings.

2. Literature review

A number of studies have analyzed the wealth effects of bank mergers. Table 1 provides a representative sample of six studies on bank merger activity. When examining these studies, three important issues concerning the prior literature are evident: the analysis is based on early time periods; the sample sizes are limited; and the measured wealth effects for merger participants are mixed.

Table 1 documents that most of the studies on bank merger activity focuses on relatively short time periods of 5-year intervals in the early to mid-1980s. Only Houston and Ryngaert (1994,1997) extend their analysis past 1986 with studies covering 1985–1991 and 1985–1992. In addition, many of these studies have relatively small sizes. Trifts and Scanlon (1987) examine 21 mergers over 4 years, while Neely (1987) studies 26 acquisitions over 7 years and James and Wier (1987) examine 60 out of 264 potential acquisitions over a 9-year period.

Finally, Table 1 shows that there is some variation in analysis across these six studies. For example, James and Wier (1987) focus only on bidder returns while the others examine returns to both targets and bidders. In addition, only Houston and Ryngaert (1994) provide results of the combined firms' returns. The other studies do not examine combined firm returns, focusing instead on bidder and target firms separately.

Taking the simple averages of each study in Table 1 indicates that target firms gain (20.48%) and bidder firms roughly break even (-0.57%). However, variation does exist among these measurements of wealth effects. While all studies find that target firms gain significantly, returns to targets range from 9.66% (Cornett and De, 1991) to 36.22% (Neely, 1987). In addition, two studies find bidder returns significantly positive, two insignificantly negative, and two others significantly negative. In all, returns to bidder firms range from significantly negative (-3.25%) to significantly positive (3.12%). Although Houston and Ryngaert (1994) measure combined firm abnormal returns, there are some questions to the overall gain from bank mergers as these returns are, on average, insignificantly positive (0.46%) over a 5-day event window.

Extending the analysis to a much larger data set (558 mergers) over a longer time period (1980–1997) will provide a better opportunity to measure the full

Table 1
Comparison of event studies on bank mergers

Number	Authors	Time period	Number of observations	Target return (%)	Bidder return (%)	Combined firm return (%)
1	James and Wier (1987)	1972–1983	60 acquisitions (264 potential)	N.D. ^a	1.77	N.D. ^a
2	Neely (1987)	1979–1985	26 acquisitions	36.22	3.12	N.D. ^a
3	Trifts and Scanlon (1987)	1982–1985	21 mergers	21.37	–3.25	N.D. ^a
4	Cornett and De (1991)	1982–1986	152 bidders, 37 targets	9.66	–0.40	N.D. ^a
5	Houston and Ryngaert (1994)	1985–1991	153 mergers (22 not completed)	14.77	–2.25	0.46
6	Houston and Ryngaert (1997)	1985–1992	184 mergers	20.40	–2.40	N.D. ^a
Simple averages				20.48	–0.57	N.M. ^b

This table provides an overview of the results of six event studies on bank mergers. Authors, time period, number of observations, target return, bidder return, and combined firm return are all variables taken from the original studies. Simple averages are the sum of all the available returns for target or bidder firms divided by the number of papers. Since there is only one paper that calculates combined firm returns, there is no simple average for the combined firm.

^aN.D. = not done in original study.

^bN.M. = not meaningful.

wealth effects from bank mergers and any intertemporal variation that may occur. With extremely small data sets, results can easily be influenced by one or two unusual mergers. Moreover, much of the previous analysis does not include more recent mergers from the 1990s. Using an expanded database will allow for specific analysis of the effects in the 1990s, with the 1980s serving as a benchmark.

3. Mergers and acquisitions database and sample statistics

3.1. The bank merger sample

To create a sample of mergers¹ during the 1980–1997 period, all firms from the Center for Research in Security Prices (CRSP) tapes that had a delist code in the 200s (merger) or 300s (exchange) were selected. To focus on banks, all firms with a three-digit SIC code of 602 (banks) or 671 (holding companies) were chosen. This resulted in a preliminary sample of 771 observations.

SIC code 671X includes various types of holding companies (for example, both Transco Energy and Shawmut, the bank holding company for Shawmut National Bank, have an SIC code of 6710). As a result, each company with an SIC code of 671X was examined to determine its primary business. Primary business was determined from *Mergers and Acquisitions*, *MergerStat Review*, and the *Wall Street Journal Index*. If there was a discrepancy among these three sources as to the nature of the company, that company was cross-checked further until a consensus was reached. From the preliminary sample of 771 firms, 164 were deleted because they were not *bank* holding companies (i.e., they were instead insurance companies, thrifts, shipping conglomerates, etc.).

An additional 24 firms were removed from the sample for technical reasons: 11 were mergers in which both firms were included, thus one of the merger partners had to be reclassified as not a target firm²; four were duplicate listings of a firm; four were firms that repurchased all shares outstanding (and in two cases, converted into a BHC); three were government bailouts of failing institutions; one

¹ Unless noted otherwise, throughout this paper the terms merger, acquisition, and takeover are used interchangeably.

² These 11 firms can be considered mergers of equals (Houston and Ryngaert, 1994 detail the criteria for determining mergers of equals). In these cases, both bidders and targets are listed as the acquired firm. The firm designated as the bidder firm was the firm who retained more board seats after the merger or otherwise appeared to maintain the upper hand (i.e., with the Chase-Chemical merger, the combined entity was named Chase, but the new board was heavily influenced with Chemical executives including the CEO). Analysis was also conducted switching target and bidder designations for these 11 merger of equals and the results were qualitatively the same.

was the termination of a voting trust in exchange for capital stock; and one was the sale of several units of the firm, but the original target remained intact.

As a result, there are 583 bank mergers from 1980–1997 in my sample. By design, this sample consists only of mergers that are ultimately successful. While this exclusion of unsuccessful mergers may lead to a bias in the results, the unique nature of the banking industry most likely precludes this. Due to regulatory constraints, hostile takeovers are a rarity in the banking industry. Most mergers are friendly and are likely to be consummated. Moreover, once a takeover attempt has been made on a particular firm, it is highly probable that firm will be taken over within the next few years.³

For the 583 sample firms, the following variables were collected: target cusip, bidder cusip, announcement date, shareholder approval date, regulatory approval date, completion date, dollar value of merger, target share price, bidder share price, exchange ratio (target to bidder), method of payment, target state, bidder state, and event type (acquisition or merger of equals). In addition, further outside information was gathered. For example, if there was any announcement or hint of a merger prior to the actual announcement date, this was recorded as the rumor date.⁴ In addition to the sources listed above, information was gathered from the following sources: *Capital Changes Reporter*, *Predicasts: F and S Index plus Text*, *Merger and Acquisition Sourcebook*, *Moody's Banking and Finance Manual*, *Moody's Industrial Manual*, the *New York Times Index*, the *American Banker*, *Lexis-Nexis*, and *Dow Jones News Retrieval*.

Of the 583 sample firms, 59 are missing some data. In particular, 19 bidders are foreign; 24 bidders are private entities with no returns available; nine cases do not have the value of the acquisition; three cases have no announcement date; two cases have no completion date; and two case have no information on how the acquisition was funded. For different parts of the analyses, these missing variables reduce the overall sample size. For example, in calculating returns around announcement dates, both targets and bidders were excluded if the bidder cusip and/or the announcement dates were missing.⁵ This reduced the number of mergers from 583 to 558. For consistency, this base sample of 558 mergers was used for all analyses.

³ In a separate analysis, I study 125 banks that have at least one unsuccessful takeover attempt since 1980. In nearly all cases, the target was eventually taken over, merged with another firm, or went out of business within the next few years. Thus, excluding unsuccessful mergers is not likely an issue for this analysis.

⁴ For example, the column in *The Wall Street Journal*, *Heard on the Street*, frequently lists rumors of pending mergers where the bidder (or occasionally the target) is not known.

⁵ Abnormal returns for targets were qualitatively the same when calculated with a variety of different sample sizes. For example, if targets are excluded only when the announcement date is not available (as opposed to when both bidder cusips and announcement dates are missing) returns are the same.

Table 2
Summary statistics on bank mergers by year

Year	Number of mergers	Value of mergers (US\$ millions)	CPI index (82–84 = 100)	Value of mergers (US\$ millions) adjusted	Mean value of merger (US\$ millions)	Mean value of merger (US\$ millions) adjusted	Median value of merger (US\$ millions)	Median value of merger (US\$ millions) adjusted
1980	4	160.40	0.824	194.66	40.10	48.67	27.50	33.37
1981	5	312.46	0.909	343.74	62.49	68.75	47.20	51.93
1982	12	1119.05	0.965	1159.64	74.60	77.31	64.00	66.32
1983	18	2552.80	0.996	2563.05	134.36	134.90	66.00	66.27
1984	20	3512.30	1.039	3380.46	175.62	169.02	138.50	133.30
1985	20	5645.50	1.076	5246.75	245.46	228.12	202.00	187.73
1986	38	6932.56	1.096	6325.33	198.07	180.72	119.20	108.76
1987	27	10,426.33	1.136	9178.11	325.82	286.82	116.25	102.33
1988	40	10,904.80	1.183	9217.92	265.97	224.83	81.00	68.47
1989	20	2880.87	1.240	2323.28	144.04	116.16	65.00	52.42
1990	20	5623.19	1.307	4302.36	234.30	179.27	97.80	74.82
1991	21	10,079.13	1.362	7400.24	530.48	389.49	74.39	54.62
1992	32	9116.12	1.403	6497.59	284.88	203.05	122.25	87.13
1993	49	10,224.04	1.445	7075.46	213.00	147.41	95.00	65.74
1994	56	14,970.38	1.482	10,101.47	258.11	174.16	83.11	56.08
1995	51	26,151.90	1.524	17,160.04	493.43	323.77	81.70	53.61
1996	65	30,010.49	1.569	19,127.14	576.36	367.34	86.00	54.81
1997	60	37,049.50	1.605	23,083.80	617.50	384.74	91.55	57.04
All	558	187,671.82			336.33		92.38	

This table provides summary statistics for the sample of 558 bank mergers in the 1980–1997 period. Bank mergers are all completed acquisitions of any banking firm (with an SIC code = 612_, 671_) listed on the CRSP tapes denoted by a delist code in the 200s or 300s. The value of a merger is determined by multiplying the number of shares outstanding times the price of the stock at completion of a merger as defined in articles from various financial sources. The CPI Index is the consumer price index (not seasonally adjusted) for the US city average of all items with the average of 1982–1984 as the base year. Source of CPI data is the Bureau of Labor Statistic's web page, <http://stats.bls.gov>.

3.2. Sample statistics

Table 2 provides summary statistics for the bank merger sample by year, including number of mergers, as well as mean and median values. The number of mergers rose through the 1980s and reached a record high of 65 public mergers in 1996. The mean value of merger activity follows a similar pattern to that of the number of mergers. Table 1 shows that adjusting mean values by the CPI Index (average of 1982–1984 as base year) rescales the values, but does not change the pattern. Moreover, (adjusted) median values indicate that the pattern is similar.

This increase in the number and value of bank mergers over time is expected, in large part due to the on-going deregulation in the banking industry. In particular, in the early 1980s, merger activity was limited by strict state interstate branching laws. In the mid-1980s, various groups of states formed regional

Table 3
Comparison of all public mergers and bank mergers by year

Year	Number of all public mergers	Number of bank mergers	% Bank mergers of public	Value of all public mergers (US\$ millions)	Value of bank mergers (US\$ millions)	% Bank mergers of public
1980	n.a.	4	n.a.	n.a.	160.4	n.a.
1981	156	5	3.21	56,569.4	312.5	0.55
1982	176	12	6.82	31,501.8	1119.1	3.55
1983	181	18	9.94	39,471.4	2552.8	6.47
1984	204	20	9.80	82,731.0	3512.3	4.25
1985	321	20	6.23	116,675.5	5645.5	4.84
1986	352	38	10.80	89,866.2	6932.6	7.71
1987	267	27	10.11	85,924.9	10,426.3	12.13
1988	436	40	9.17	156,112.9	10,904.8	6.99
1989	320	20	6.25	121,870.6	2880.9	2.36
1990	175	20	11.43	48,214.9	5623.2	11.66
1991	144	21	14.58	31,668.0	10,079.1	31.83
1992	178	32	17.98	31,171.5	9116.1	29.25
1993	191	49	25.65	111,041.5	10,224.0	9.21
1994	291	56	19.24	109,101.3	14,970.4	13.72
1995	395	51	12.91	202,916.8	26,151.9	12.89
1996	454	65	14.32	285,185.0	30,010.5	10.52
1997	564	60	10.64	374,399.5	37,049.5	9.90
All	4805	558	11.61	1,974,422	187,671.8	9.51

This table compares bank mergers with overall public merger activity in the 1980–1997 period. The number and value of all public mergers are defined as all completed acquisitions by publicly traded companies as defined by *MergerStat Review*. Bank mergers are all completed acquisitions of any banking firm (with an SIC code = 612_, 671_) listed on the CRSP tapes with a delist code in the 200s or 300s. The value of bank mergers is determined by multiplying the number of shares outstanding times the price of the stock at completion of a merger as defined in articles from various financial sources. % Bank mergers of public is the number (or value) of bank mergers divided by the number (or value) of all public mergers.

compacts (i.e., Northeast and Southeast Compacts) that allowed banks headquartered within the region to acquire other banks headquartered within the same region (but, at the same time, prevented banks headquartered outside of the area from participating). By the beginning of the 1990s, many states had replaced these regional compacts with national interstate branching laws where banks from any other state could enter their state as long as banks within their own state were allowed to enter these other states.

Table 3 illustrates the relative importance of bank mergers over time by comparing merger activity for all public firms with that of banking firms. Public bank mergers, on average, represent nearly 12% of all public mergers and 10% of the total value. In some years, the value of bank mergers constitutes nearly a third of all dollar-value merger activity (31.8% for 1991 and 29.3% for 1992). Thus, bank mergers are not only increasing over time, but represent a larger portion of public mergers.

4. Event study analysis

4.1. Testable hypotheses

One force behind the growth in bank mergers documented above is deregulation (coupled with changes in technology and scale economies). Regulatory changes at both the state and federal level have made it easier for banking firms to merge. This deregulation enables tests of two distinct hypotheses of mergers that have been presented in the previous literature: see for example, Jensen and Ruback (1983), Malatesta (1983), Roll (1986) and Jarrell et al. (1988) the synergy hypothesis and the hubris or empire building hypothesis. Table 4 outlines the expected returns to target, bidder, and combined firms based on each of the two hypotheses.

First, mergers may allow for gains or synergies that were previously prevented because of restrictions on branching and banking activity. The *synergy* hypothesis

Table 4
Testable hypotheses and expected effects for bank mergers

Firms	Hubris or empire building hypothesis	Synergy hypothesis	Hubris and synergy hypothesis
Target	Positive	Positive	Positive
Bidder	Negative	Non-negative	Negative
Combined	Non-positive	Positive	Positive

This table details two testable hypotheses as to why bank mergers occur as well as the combination of the two: the hubris or empire building hypothesis and the synergy hypothesis. For each hypothesis, the expected effects for target, bidder, and the combined firms are indicated. The hubris and empire building hypothesis states that mergers are not wealth-creating events, but are motivated by bidder firms attempting to build empires. By contrast, the synergy hypothesis states that mergers are wealth-creating events. The combination of the two hypotheses indicates that mergers are wealth-creating events, but bidder firms may overpay to obtain these gains.

predicts that target firm returns should be positive, bidder returns should be non-negative, and the combined firm returns should be positive.

Alternatively, mergers may be a function of empire building and hubris. Analysis by Roll (1986) posits that mergers are not wealth-creating activities and are motivated by hubris. The *hubris* hypothesis would predict that, on average, target firm returns are positive, bidder firm returns are negative, and the combined firm returns are non-positive. Under this hypothesis, mergers are not wealth-creating events, but attempts by bidder firms to build dynastic empires.

A third alternative explanation may be that mergers are a function of both the synergy and hubris hypotheses. If mergers are a function of both hypotheses, then this would predict a positive revaluation for the combined firm with negative bidder firm returns. Under this *combined synergy and hubris* hypothesis, positive synergies may be associated with a merger, however, a bidder firm might overpay for the acquisition of these synergies.

4.2. Cumulative abnormal returns

A basic event study is utilized to calculate abnormal returns for target and bidder firms. I focus on two different event periods: a 36-day window ($-30, +5$) and an 11-day window ($-5, +5$) around each *initial* announcement date. For these periods, all missing values are removed. For target firms, the *initial* announcement date is the first date any acquisition attempt is made (within 2 years of the announcement date that was ultimately successful). For bidder firms, however, the initial announcement date is the first date *for that bidder* that an acquisition attempt is made. If there is only one bidder, the *initial* announcement dates for bidder and target firms are the same.

The base method used to calculate cumulative abnormal returns is net-of-market returns where abnormal returns are calculated by subtracting a market index from the firms' raw returns. The value-weighted index is used as the base index for market returns. Cumulative abnormal returns are determined using a geometric process. Geometric returns are found by multiplying the product of that day's return times the previous cumulative product, $((1 + r_i) * (1 + r_{i-1}))$, and then subtracting off one from the final product, where r_i is the i th day return and r_{i-1} is the cumulative product of all the days returns prior to the i th day over the event window.⁶

⁶ Cumulative abnormal returns were also calculated using an arithmetic or simple process (sum of abnormal returns over the 11- and 36-day event windows). There is the potential, however, that summing the net-of-market returns will lead to positively biased returns if there is some bid-ask bounce in the stock of the banks being analyzed. In addition, cumulative abnormal returns were calculated using a market model (geometric and arithmetic returns) plus three other methods, cumulative daily returns, holding period daily returns, and abnormal holding period returns. In all cases, mean returns for both target and bidder firms were qualitatively the same. In order to conserve space, these tables are omitted.

Cumulative abnormal returns of the combined firm (target firms plus bidder firms) are calculated by following the method outlined in Houston and Ryngaert (1994):

$$\text{Combined Cumulative Abnormal Returns} = \frac{(V_{ib} \text{CAR}_{ib}) + (V_{it} \text{CAR}_{it})}{(V_{ib} + V_{it})} \quad (1)$$

where V_{ib} is the value of the i th bidder firm – 30 days before the initial announcement date, V_{it} is the value of the i th target firm – 30 days before the initial announcement date, CAR_{ib} is the cumulative abnormal return for the i th bidder firm over the 36-day window, and CAR_{it} is the cumulative abnormal return for the i th target firm over the 36-day window.

To gauge statistical significance, a t -test and subsequent p -value are calculated from the mean assuming a normal distribution. Although not emphasized in the text, a Wilcoxon signed rank test is also performed (with p -value) which relaxes the assumption of normality, but assumes a symmetric distribution. A sign test and p -value sign statistic are determined from the median with both assumptions of normality and symmetry being relaxed.

4.3. Results

4.3.1. Target and bidder returns

In Table 5, cumulative abnormal normal returns are provided over a 36-day (–30, +5) and an 11-day (–5, +5) event window. As reported in Panel A, cumulative abnormal returns for the full 1980–1997 period are 22.6% for target firms (p -value = 0.00). For bidders, cumulative abnormal returns are –0.10% (p -value = 0.80). Median returns for bidders and targets are nearly the same. These results indicate that, on average, target firms gain and bidder firms break even.

Panel B of Table 5 shows that cumulative abnormal returns over the 11-day event window for the full period are 17.1% for targets (p -value = 0.00) and –1.08% for bidder firms (p -value = 0.00). These results suggest that, on average, targets still gain while bidder firm returns are now statistically negative.

To measure the effects of bank mergers over time and to examine the 1990s in particular, cumulative abnormal returns are estimated for three time periods: 1980–1985, 1986–1990, and 1991–1997. For the three periods, there are 102, 135, and 321 firms, respectively. These three periods were chosen to approximate the changes of regulation in the banking industry. The first two periods are determined by the creation of regional compacts. By 1985, several regional compacts had formed (i.e., Northeast and Southeast Compacts) and spurred an increase in the number of mergers, as reported in the prior section. The third

Table 5

Target, bidder, and combined firm cumulative abnormal returns by time period

Time period	Mean (%)	t-Statistic	p-Value	Signed rank	p-Value signed rank	Median (%)	Sign statistic	p-Value sign statistic
<i>Panel A: Cumulative abnormal returns – 30 days before to + 5 days after the initial announcement date</i>								
<i>Targets</i>								
1980–1997	22.64	25.32	0.00	70,131.5	0.00	21.68	212.0	0.00
1980–1985	21.84	9.28	0.00	2329.5	0.00	21.15	38.0	0.00
1986–1990	20.49	10.29	0.00	3762.0	0.00	19.89	41.5	0.00
1991–1997	23.68	16.74	0.00	23,154.5	0.00	20.41	125.5	0.00
<i>Bidders</i>								
1980–1997	–0.10	–0.25	0.80	–4168.5	0.24	–0.41	–8.5	0.49
1980–1985	–0.08	–0.09	0.93	–56.5	0.85	–0.47	–2.0	0.77
1986–1990	–2.14	–2.49	0.01	–1757.0	0.00	–3.46	–20.5	0.00
1991–1997	0.06	0.14	0.89	–1877.5	0.26	–0.41	–10.5	0.26
<i>Combined firms</i>								
1980–1997	3.03	7.184	0.00	20,410.0	0.00	1.67	45.5	0.00
1980–1985	4.42	4.964	0.00	1158.0	0.00	3.68	13.0	0.01
1986–1990	0.86	0.890	0.37	–230.5	0.59	–1.35	–8.0	0.19
1991–1997	3.53	6.615	0.00	8490.5	0.00	2.39	40.5	0.00
<i>Panel B: Cumulative abnormal returns – 5 days before to + 5 days after the initial announcement date</i>								
<i>Targets</i>								
1980–1997	17.10	22.57	0.00	68,148.0	0.00	15.33	194.0	0.00
1980–1985	15.95	11.01	0.00	2337.5	0.00	16.29	37.5	0.00
1986–1990	18.33	10.60	0.00	3939.0	0.00	15.31	44.5	0.00
1991–1997	16.94	16.97	0.00	22,620.0	0.00	15.02	112.0	0.00
<i>Bidders</i>								
1980–1997	–1.08	–4.71	0.00	–19582.5	0.00	–0.90	–61.5	0.00
1980–1985	–0.96	–1.69	0.09	–426.5	0.13	–0.48	–5.5	0.31
1986–1990	–1.64	–3.01	0.00	–1765.5	0.00	–1.85	–24.0	0.00
1991–1997	–0.88	–3.26	0.00	–5776.0	0.00	–0.86	–32.0	0.00
<i>Combined firms</i>								
1980–1997	1.80	5.67	0.00	13,194.0	0.00	0.63	21.5	0.07
1980–1985	2.56	3.96	0.00	1018.0	0.00	2.48	15.0	0.00
1986–1990	1.09	1.44	0.15	–71.5	0.87	–0.26	–1.0	0.93
1991–1997	1.87	4.67	0.00	4380.5	0.00	0.42	7.5	0.42

period reflects the continued deregulation in the banking industry throughout the 1990s where more states allowed unrestricted interstate bank mergers. This change in policy led to a further increase in the number of mergers in the 1991–1997 period.

Cumulative abnormal returns for both bidders and targets across the three time periods are reported in Table 5. Panel A details that over the 36-day window,

returns to targets over the three periods are all similar, ranging from 21.8% (p -value = 0.00) in the 1980–1985 period to 20.5% (p -value = 0.00) in the 1986–1990 period to 23.7% (p -value = 0.00) in the 1991–1997 period. Median values are nearly identical.

For bidder firms, returns fluctuate around zero, falling from -0.08% (p -value = 0.93) in the 1980–1985 period to -2.1% (p -value = 0.01) in the 1986–1990 period and then rising to 0.06% (p -value = 0.89) in the 1991–1997 period. Similar results are found when examining median values for the three periods as well.

In Panel B of Table 5, over the 11-day event window, returns to targets over the three time periods are all similar, ranging from 16.0% to 18.3% (with all three having p -values of 0.00). For bidder firms, returns range from -1.6% to -0.9% (all three are significantly negative). Median values for target and bidder firm returns are all nearly identical.

4.3.2. The combined firm returns

Cumulative abnormal returns are also calculated for the combined firm. As with target and bidder firm returns, results using the various estimation techniques are qualitatively the same. For simplicity, only geometric net-of-market returns (using a value-weighted index for market returns) are presented for the overall period and the three time periods in Table 5.

In Panel A, over the 36-day ($-30, +5$) event window cumulative abnormal returns to the combined firm are, on average, 3.0% (p -value of 0.00). The median value is slightly lower, but still highly significant. This 3.0% average increase in the combined firms' returns translates into approximately a six billion-dollar increase in total value for the entire sample.

Notes to table 5:

This table reports mean and median net-of-market cumulative abnormal returns around 558 bank merger announcements for target, bidder, and combined firms from 1980 to 1997 and for three time periods: 1980–1985, 1986–1990, and 1991–1997. For the three periods, there are 102, 135, and 321 firms, respectively. Returns are calculated over two event windows. Panel A details returns over a 36-day event window ($-30, +5$) around the *initial* announcement date. Panel B provides returns over an 11-day event window ($-5, +5$). For target firms, the initial announcement date is the first date an acquisition attempt is made. For bidder firms, the initial announcement date is the first date *for that bidder* that an acquisition attempt is made. Mean and median returns are geometric cumulative abnormal returns from a value-weighted index. Geometric cumulative abnormal returns are found by multiplying the product of that day's return times the previous cumulative product, $((1 + r_i) * (1 + r_{i-1}))$, and then subtracting off one from the final product, where r_i is the i th day return and r_{i-1} is the cumulative product of all the day returns prior to the i th day. The CRSP value-weighted return index (including all distributions) was used to calculate abnormal returns.

Panel A also details returns to the combined firm over the same three time periods used for target and bidder firms. Mean cumulative abnormal returns are 4.4% (p -value = 0.00) for the 1980–1985 period, 0.9% (p -value = 0.37) for the 1986–1990 period, and 3.5% (p -value = 0.00) for the 1991–1997 period. For the 1990s, this 3.5% increase translates into nearly a five billion-dollar increase in total value for 321 mergers.

Panel B indicates that over the 11-day event window, cumulative abnormal returns to the combined firm, on average, are 1.8% (p -value of 0.00). These combined firm returns are still highly significantly positive. Over the three time periods, cumulative abnormal returns for the combined firm range, on average, from 2.56% in the 1980–1985 period to 1.09% in 1986–1990 to 1.87% in the 1991–1997 period (only returns in the 1986–1990 period are not statistically significant with a p -value of 0.15).⁷

4.3.3. Comparing time periods

Table 6 formally tests for differences in wealth effects over time. A parametric t -test between two samples is used comparing cumulative abnormal returns in 1980–1985 vs. 1986–1990, 1980–1985 vs. 1991–1997, and 1986–1990 vs. 1991–1997 for bidders, targets and the combined firm. The t -test provides test statistics and p -values for variances of unequal sizes. The results are qualitatively the same when variances are assumed to be equal.

Over the 36-day event window (Panel A of Table 6), target returns trend upward in the 1990s; yet the difference among abnormal returns in the three time periods are all statistically insignificant. For bidders, returns also appear to be greater in the 1990s. Statistical tests show that while the 1980–1985 and 1986–1990 periods and 1980–1985 and 1991–1997 periods are indistinguishable, the 1991–1997 period differs from 1986–1990 (p -value = 0.03). This difference implies that bidder returns in the 1990s are statistically more positive than in the mid-1980s. For the combined firm, cumulative abnormal returns follow a similar pattern to bidder returns. In particular, the combined firm returns are more positive in the 1990s than in the mid-1980s (p -value of difference of means is 0.02).

Over the 11-day event window (Panel B of Table 6), there is still no significant difference among target firm abnormal returns in the three time periods. For

⁷ Prior evidence suggests that to calculate cumulative abnormal returns around mergers, a longer event window is needed to capture the run-up in target returns prior to a merger announcement. However, there is some concern in using the longer event window in calculating bidder firm returns as there is less public ruminations about a bidder getting ready to make a bid. As a result, I also examined combined firm returns using a 36-day (–30, +5) window for target firms, but an 11-day (–5, +5) event window for bidders. The results indicate that with these event windows, combined firm returns are, on average, significantly positive across time and over the three time periods and that returns from the 1990s are significantly larger than those in the mid-1980s.

Table 6

Statistical significance among time periods for target, bidder, and combined firms

Firms	1980–1985 vs. 1986–1990	1980–1985 vs. 1991–1997	1986–1990 vs. 1991–1997
<i>Panel A: t-Tests for cumulative abnormal returns, – 30 days before to + 5 days after announcement date</i>			
Target	0.79	0.25	0.14
Bidder	0.20	0.51	0.03
Combined	0.02	0.66	0.02
<i>Panel B: t-Tests for cumulative abnormal returns – 5 days before to + 5 days after announcement date</i>			
Target	0.29	0.57	0.49
Bidder	0.40	0.89	0.16
Combined	0.14	0.36	0.32

This table provides parametric *t*-tests between two samples to compare returns from 558 bank mergers in the period 1980–1997. Panel A details *p*-values of *t*-tests for returns calculated over a 36-day event window (–30, +5). Panel B provides *p*-values of *t*-tests for returns calculated over an 11-day event window (–5, +5). *p*-Values for target, bidder, and the combined firms are provided. *t*-Tests are constructed comparing returns from 1980–1985 vs. 1986–1990, 1980–1985 vs. 1991–1997, and 1986–1990 vs. 1991–1997. The *t*-tests provide *p*-values for variances of unequal sizes. In all cases, the results are virtually the same when variances are equal. Net-of-market cumulative abnormal returns are calculated using a geometric process with a value-weighted market index. Geometric cumulative abnormal returns are found by multiplying the product of that day's return times the previous cumulative product, $((1 + r_i) * (1 + r_{i-1}))$, and then subtracting off one from the final product, where r_i is the *i*th day return and r_{i-1} is the cumulative product of all the day returns prior to the *i*th day. The CRSP value-weighted return index (including all distributions) was used to calculate abnormal returns.

bidders, however, the 1990s are now no longer statistically larger than the mid-1980s (*p*-value of difference is 0.16). For the combined firm, returns over the three time periods are all insignificantly different as well.

4.4. Summary of cumulative abnormal returns

Results from the event study analysis indicate that target returns over a 36-day event window are continually positive across time and different from zero in the magnitude of roughly 23%. Examining returns over an 11-day window demonstrates that target returns are still positive and statistically significant. These significantly positive returns are similar to prior work on mergers in general as described in Weston et al. (1998).

For bidder firms, results are sensitive to the event window selected. Over a 36-day event window, returns are insignificantly different from zero across time. Over an 11-day event window, however, returns are statistically negative. For the

combined firm, returns overall are positive across time for either event window selected. Moreover, combined returns appear to be improving in the 1990s.⁸

5. Cross-sectional analysis

Analysis of bank merger activity in the 1990s, in particular, indicates that the effects from these mergers are positive to merger participants. However, it is possible that the returns in the 1990s are due to changing aspects of the mergers (for example, method of payment, multiple bids, geographic location, etc.). In particular, it is important to address why we observe specific patterns in intertemporal returns. These patterns may be a function of several key factors: (1) changes in terms of method of payment, (2) changes in the competitiveness of bidding in mergers (which may effect the division of gains more than total combined firm returns), (3) increased technological opportunities for cost savings coupled with overlap in market operations that may permit greater synergies, and (4) changes in management teams whose incentives may have become more aligned with shareholder interests due, in part, to deregulation of the banking industry. As a result, this section details cross-sectional sensitivity analysis in attempts to determine the source of patterns in returns and ensure that the results from the 1990s are robust.

5.1. Method of payment

One factor that may affect returns is the method of payment (cash, stock, or a mixture) used to finance the merger. If stock mergers are a negative signal and worse for bidders, then in those periods when more mergers are financed with stock, on average, bidder returns should be statistically lower. The prior literature

⁸ These results, however, may be a function of how cumulative abnormal returns are calculated. In particular, Canina et al. (1998) document that using daily equal-weighted returns over a long event window can lead to a bias in returns. This bias is due, in part, to the illiquidity of small firms. As a result, cumulative abnormal returns for both bidders and targets are calculated over the three time periods using both an equal- and value-weighted daily market index to calculate cumulative abnormal returns over a 36-day event window. For the 1980s, returns are nearly identical using the two indices. For the 1990s, however, there is roughly a 2.6% difference between returns using an equal- and value-weighted daily market index. Examining the 1990s by year, the difference between returns using the two indices is, on average, 19% per year, 1.6% per month, and approximately 2.6% over 36 days (the length of the event window implemented in this analysis). Thus, the average difference between bidder and target cumulative abnormal returns using the value- vs. equal-weighted index of 2.6% appears to be directly the result of market index and the daily, equal-weighted index should not be used.

Table 7
Fraction of mergers by method of payment by time period

Time period	Cash + Mix (%)	Stock only (%)
<i>Panel A: Bank mergers</i>		
1980–1997	40.34	59.66
1980–1985	63.22	36.78
1986–1990	48.37	51.63
1991–1997	30.88	69.12
<i>Panel B: All public mergers</i>		
1980–1997	62.65	37.35
1980–1985	76.99	23.01
1986–1990	77.52	22.47
1991–1997	47.47	52.53

This table provides the fraction of mergers by method of payment from 1980–1997 and for three time periods: 1980–1985, 1986–1990, and 1991–1997. Panel A details the fraction of bank mergers by method of payment and Panel B details the fraction of all public mergers by method of payment. Bank mergers are all completed acquisitions of any banking firm (with an SIC code = 612_, 671_) listed on the CRSP tapes with a delist code in the 200s or 300s. All public mergers are defined as all completed acquisitions by publicly traded companies as defined by *MergerStat Review*. Method of payment is determined by examining all announcements (in the *Wall Street Journal* and other financial sources) concerning a merger, and recording how the bidder determined to finance the merger: stock, cash, or mix. The number of mergers Cash + Mix is defined as all mergers using either cash only or more than one source of payment: a combination of cash, stock, and/or debt. Stock only indicates that the merger was financed with stock only.

has found that mergers financed using stock have lower returns than those financed with cash or a mixture of cash and stock.⁹

Table 7 examines the fraction of mergers by method of payment from 1980–1997 and over the three time periods. Panel A focuses on bank mergers, while Panel B examines all public mergers. Public bank mergers are all completed acquisitions of any bank (SIC code = 612_, 671_) listed on the CRSP tapes with a delist code in the 200s or 300s. All public mergers are defined as all completed acquisitions by publicly traded companies as defined by *MergerStat Review*. The method of payment is determined by examining all announcements (in the *Wall Street Journal* and other financial sources) concerning a merger, and recording how the bidder determined to finance the merger: stock, cash or mix. The method of payment *mix* is defined as all mergers using more than one source of payment; a combination of cash, stock, and/or debt.

⁹ See Houston and Ryngaert (1997), Amihud et al. (1990), Martin (1996) and Travlos (1983) for more discussion on method of payment. Houston and Ryngaert (1997) and Amihud et al. (1990) document that classifying mergers by method of payment to control for signaling or agency effects has a noise element. In particular, they find that negative bidder returns are associated with the degree to which the target's returns are sensitive to changes in the bidder's stock price while the merger is pending and the level of managerial ownership.

Panel A demonstrates that stock is the main choice of payment method for bank mergers over time. Nearly 60% of all bank mergers are financed using stock only. In addition, stock mergers have increased, rising from 36.1% in 1980–1985 to 69.1% in the 1990s. Panel B of Table 7 indicates that the fraction of *all public mergers* financed with stock only also increases; more than doubling from 23.0% in 1980–1985 to 52.5% in 1991–1997. As a result, it appears that mergers financed with stock-only are increasing in all mergers, not just bank mergers.

Cumulative abnormal returns to targets and bidders are calculated by method of payment. Returns are calculated as detailed in Section 4, segmented into a 36-day (−30, +5) and an 11-day event window (−5, +5). Table 8 documents that both

Table 8
Mean cumulative abnormal returns by method of payment

Time period	36-Day (−30, +5) event window			11-Day (−5, +5) event window		
	Cash + Mix (%)	Stock only (%)	p-Value of t-test: Cash + Mix vs. Stock	Cash + Mix (%)	Stock only (%)	p-Value of t-test: Cash + Mix vs. Stock
<i>Target cumulative abnormal returns</i>						
1980–1997	25.38	20.84	0.01	19.07	15.88	0.05
1980–1985	23.74	17.33	0.07	17.57	13.34	0.16
1986–1990	25.76	16.41	0.02	23.14	14.49	0.01
1991–1997	26.28	22.86	0.21	17.41	16.76	0.79
<i>Bidder cumulative abnormal returns</i>						
1980–1997	0.65	−1.04	0.02	−0.32	−1.55	0.01
1980–1985	−0.03	−0.86	0.61	−0.47	−1.76	0.30
1986–1990	0.65	−3.94	0.01	−0.26	−2.74	0.02
1991–1997	1.12	−0.12	0.20	−0.25	−1.12	0.15

This table provides mean net-of-market cumulative abnormal returns by method of payment around 558 bank merger announcements for targets and bidders. This table also provides parametric *t*-tests between two samples to compare returns by method of payment. *t*-Tests are constructed comparing returns from cash + mix vs. stock only. The *t*-tests provide *p*-values for variances of unequal sizes. In all cases, the results are virtually the same when variances are equal. Returns are calculated over a 36-day (−30, +5) and an 11-day (−5, +5) event window around the *initial* announcement date. For target firms, the initial announcement date is the first date an acquisition attempt is made. For bidder firms, the initial announcement date is the first date *for that bidder* that an acquisition attempt is made. Mean and median returns are geometric cumulative abnormal returns from a value-weighted index. Geometric cumulative abnormal returns are found by multiplying the product of that day's return times the previous cumulative product, $((1 + r_i) * (1 + r_{i-1}))$, and then subtracting off one from the final product, where r_i is the *i*th day return and r_{i-1} is the cumulative product of all the day returns prior to the *i*th day. The CRSP value-weighted return index (including all distributions) was used to calculate abnormal returns. Method of payment is determined by examining all announcements (in the *Wall Street Journal* and other financial sources) concerning a merger, and recording how the bidder determined to finance the merger. The number of mergers Cash + Mix is defined as all mergers using either cash only or more than one source of payment: a combination of cash, stock, and/or debt. Stock only indicates that the merger was financed with stock only.

target and bidder returns are higher, on average, for mergers financed by a mixture than stock-only using either event window (p -value of differences all 0.01 to 0.05). Given that stock acquisitions are more poorly received than cash offers and that there are more stock acquisitions in the 1990s, the higher returns to back acquisitions in the 1990s are not attributable to changes in financing of mergers.

5.2. Number of bids per target firm

A second factor that may affect returns is the number of bids per target firm. James and Wier (1987), Cornett and De (1991), and others posit that premiums should be different to firms with multiple bids. If a group of firms all bid on the same target, then the overpayment hypothesis would predict that the successful bidder would overpay in order to win the bidding war. If multiple bids are a signal of overpayment, then bidders, on average, should have statistically lower returns when there are multiple bidders.

Table 9 examines target and bidder firms by the number of public bids a target firm receives. All public bids are determined as follows: for every bank acquired over the 18-year time period, I search the previous 2 years prior to the announcement date for any other takeover attempt.¹⁰ This provides the number of takeover attempts each target faces including the takeover bid that is ultimately successful. The numbers of bids is then separated into two groups for analysis: one bid and two or more bids.

Panel A of Table 9 examines the *fraction* of mergers by number of bids. This table demonstrates that the majority of target firms receive only one public bid over time (on average 85%). In addition, the number of mergers with only one bid has increased from 73.8% in 1980–1985 to nearly 93% in 1991–1997.

Panel B of Table 9 details *cumulative abnormal returns* to targets and bidders by number of bids. Returns to targets with only one bid are, on average, 23% over time vs. nearly 20% for targets with more than one bid. In the 1990s, returns to targets with only one bid are nearly 25%, while returns to targets with multiple bids are just under 16%. These results appear counter-intuitive to the overpayment hypothesis. If bidder firms are overpaying for target firms when there are multiple bidders, then target returns for mergers with two or more bids should be greater than returns for mergers with only one bid, not less.

For bidders who face no competition (one bid), cumulative abnormal returns are -0.43% over time. For mergers with two or more bids, bidder returns are approximately zero (-0.11%). In the 1990s, for mergers with only one bid, bidder

¹⁰ In searching for all public takeover attempts, I examine the *Wall Street Journal Index*, *Lexis-Nexis*, the *New York Times Index*, *Dow Jones News Retrieval*, *Mergers and Acquisitions*, and *MergerStat Review*.

Table 9

Bank mergers by number of bids by time period

Time period	Number of bids		<i>p</i> -Value of <i>t</i> -test: 1 vs. 2 +
	1 (%)	2+ (%)	
<i>Panel A: Fraction of bank mergers</i>			
1980–1997	87.93	12.07	
1980–1985	73.81	26.19	
1986–1990	84.97	15.03	
1991–1997	92.71	7.29	
<i>Panel B: Cumulative abnormal returns</i>			
<i>Targets</i>			
1980–1997	23.01	19.48	0.17
1980–1985	21.30	21.23	0.99
1986–1990	20.34	21.78	0.78
1991–1997	24.49	15.94	0.04
<i>Bidders</i>			
1980–1997	−0.43	−0.11	0.76
1980–1985	−0.58	0.46	0.61
1986–1990	−1.83	−2.30	0.84
1991–1997	0.14	1.21	0.50

This table details 558 bank mergers by number of bids from 1980–1997 and for three time periods: 1980–1985, 1986–1990, and 1991–1997. Panel A provides the fraction of bank mergers by number of bids. Panel B details mean net-of-market cumulative abnormal returns over a 36-day event window (−30, +5) around the *initial announcement date*. In addition, column three of Panel B provides parametric *t*-test between two samples to compare returns from the two groups (one bid or two or more bids). Number of bids is the number of takeover attempts each target faces including the takeover bid that is ultimately successful. The number of bids a target receives is separated into two groups: one bid and two or more bids. For target firms, the initial announcement date is the first date an acquisition attempt is made. For bidder firms, the initial announcement date is the first date *for that bidder* that an acquisition attempt is made. Mean and median returns are geometric cumulative abnormal returns from a value-weighted index. Geometric cumulative abnormal returns are found by multiplying the product of that day's return times the previous cumulative product, $((1 + r_i) * (1 + r_{i-1}))$, and then subtracting off one from the final product, where r_i is the *i*th day return and r_{i-1} is the cumulative product of all the day returns prior to the *i*th day. The CRSP value-weighted return index (including all distributions) was used to calculate abnormal returns.

returns are 0.14%, while bidder returns for mergers with multiple bids are 1.21%. These results suggest that returns for bidders in mergers with multiple bids are *higher* than for those with only one bid, which is contrary to the overpayment hypothesis.

Panel B of Table 9 also tests for differences in returns over time. A parametric *t*-test between two samples is used comparing cumulative abnormal returns from one bid vs. two or more. For targets overall, differences in returns are not statistically significant. Moreover, returns in the 1991–1997 period are statistically higher for firms with one bid vs. two or more bids (*p*-value = 0.04), which is

Table 10
Number of intrastate vs. interstate bank mergers by time period

Time period	Intrastate (%)	Interstate (%)
<i>Panel A: Intra- vs. interstate mergers, banks headquartered in same state</i>		
1980–1997	49.82	50.18
1980–1985	66.67	33.33
1986–1990	46.67	53.33
1991–1997	45.79	54.21
<i>Panel B: Intra- vs. interstate mergers, banks with branches in same state</i>		
1980–1997	68.46	31.54
1980–1985	71.57	28.43
1986–1990	57.78	42.22
1991–1997	71.96	28.04

This table details the fraction of mergers by geographic area for 558 bank mergers for 1980–1997 and for three time periods: 1980–1985, 1986–1990, and 1991–1997. Panel A details the fraction of mergers based on whether the bidder firm is headquartered in the target's headquarter state prior to the *initial* announcement date. Panel B provides the fraction of mergers based on whether the bidder firm has branches in the target's headquarter state prior to the *initial* announcement date. Bidder branch locations are obtained from Rand McNally Bankers Directory (1980–1990)/Thomson Bank Directory (1991–1997). Intrastate mergers are defined as those mergers that take place between firms within the same state. Interstate mergers are defined as those mergers that take place among bidder firms that are not in the same state as the target firm they are acquiring.

counter-intuitive to the overpayment hypothesis. For bidders, returns between firms with one bid vs. multiple bids are not statistically significant in all cases. Returns are not lower for firms with multiple bids in the 1990s. Hence, even though there are fewer multiple bid episodes in the 1990s, this does not appear to be the cause of higher bidder returns during this period.

5.3. Geographic location

Another factor that may explain the cross-sectional variation in bank merger returns is the geographic location of the banks involved in the mergers. The prior literature suggests that mergers that are more geographically focused have higher returns than mergers that are across large geographic borders; returns are higher in periods where more in-market mergers occurred.¹¹

Table 10 tests this hypothesis, by examining the number of intrastate vs. interstate bank mergers over time as a proxy for market overlap. *Intrastate mergers* are defined as those mergers that take place between targets and bidders within the same state. *Interstate mergers* are defined as those mergers that take

¹¹ See for example, DeLong (1999), Houston and Ryngaert (1994), Houston et al. (1999), and Hawawani and Swary (1990).

place among bidder firms that are not in the same state as the target firm they are acquiring.

Some bidders headquartered out-of-state may still have some operations that overlap in the target's home state. To this degree, this overlap would underestimate the number of in-market mergers. As a result, intrastate and interstate mergers are defined using two methods.

Panel A details the fraction of mergers based on whether the bidder firm is headquartered in the target's headquarters state prior to the *initial* announcement date. Panel B provides the fraction of mergers based on whether the bidder firm has branches in the target's state prior to the *initial* announcement date.¹² Bidder branch locations are obtained from *Rand McNally Bankers Directory* (1980–1990)/*Thomson Bank Directory* (1991–1997).

Panel A of Table 10 indicates that, on average, 49.8% of the mergers are among bidders and targets headquartered in the same state. Examining the three time periods, the number of intrastate mergers has decreased over time, from 66.7% to 45.8%. Comparing the 1990s with the 1980s, the percentages of interstate mergers are roughly the same in the 1990s and the late 1980s, but is much higher in the 1990s as compared to the 1980–1985 period (54.2% vs. 33.3%).¹³

Panel B of Table 10 indicates that, on average, 68.5% of the mergers are among bidders and targets where the bidder has branches in the target's headquarters state. Examining the three time periods, the number of intrastate mergers fluctuate over time, from 71.7% in 1980–1985 to 57.8% in 1986–1990 to 72.0% in 1991–1997. The percentages of interstate mergers in the 1990s are nearly the same as the early 1980s and much lower than in the 1986–1990 period.

Examining returns by geographic location, if in-market mergers are more profitable than out-of-market mergers, then returns in the 1980–1985 period should be similar to returns in the 1990s, and the 1986–1990 period should be considerably different from both of these periods (see Table 5). Results from Panel A suggest that the percentage of in-market mergers cannot explain the cross-sectional variation in bank merger returns. However, focusing on Panel B which more accurately reflects intra- vs. interstate mergers, the results now indicate that returns are significantly higher in the 1990s than in the 1986–1990 period (and there is no difference between the 1990s and the 1980–1985 period). Thus, it seems likely that, as Houston et al., (1999) suggest, the percentage of in-market mergers may help to explain the cross-sectional variation in bank merger returns.

¹² This expanded definition of intrastate mergers still does not fully capture market overlap. See Houston et al. (1999) for a more detailed treatment of in-market mergers.

¹³ Twenty-six acquisitions involving foreign bidders acquiring domestic targets are classified as interstate mergers (four percent of all mergers). Interstate mergers are about 48% if acquisitions by foreign bidders are excluded.

5.4. Board structure and compensation

Finally, variation in target, bidder, and/or combined firm returns may be due to firm-specific variables such as ownership structure, board composition, compensation, CEO age/tenure, among others. A wide variety of analyses have been conducted that examine the relation of these variables to returns from bank mergers.

It is possible that returns are related to a learning curve for mergers and the management teams whose incentives have become more aligned with shareholders in the 1990s. Several studies demonstrate that deregulation of the banking industry has been accompanied by improved pay-for-performance. Crawford et al. (1995) and Hubbard and Palia (1995) examine the relationship between bank CEO compensation and that bank's performance around bank deregulation. The authors test the hypothesis that the CEO's compensation becomes more sensitive to the CEO's performance as banks become less regulated (deregulation hypothesis).

Overall, the authors determine that CEO pay and firm performance have a stronger relationship after the introduction of banking deregulation. Furthermore, these studies document higher levels of pay in markets that allow for interstate banking; stronger pay-performance relationship in deregulated states; and increased CEO turnover after deregulation.

Results from these studies indicate that the deregulation of the banking industry has been accompanied by improved pay-for-performance among banking executives. These results suggest that the deregulation of the banking industry over the last two decades and subsequent merger activity has not led to negative wealth effects and *may* explain why bidder firms fare better in the 1990s.

6. Conclusion and implications

This paper studies a large sample of 558 bank mergers over the 1980–1997 period to determine the wealth effects of mergers in a particular industry. This analysis provides direct tests of the synergy vs. hubris hypotheses. I find that, on average, targets gain, bidders break even, and the combined firm gains over a 36-day event window. Over an 11-day window, targets gain, bidders lose, and the combined firm still gains.

Moreover, the analysis of mergers over an extended period of time (1980–1997) also provides a direct inquiry as to whether merger activity in the banking industry has created greater synergies and more benefits to merger participants through time. Existing theory indicates that deregulation should provide benefits to banking firms. I find that in the 1990s, when merger activity is dramatically increasing in the banking industry, the wealth effects over a 36-day event window to targets are statistically positive, bidder returns are non-negative and statistically larger than the mid-1980s, and combined firm returns are significantly positive and

statistically larger than the mid-1980s as well. Over the 11-day window, target returns remain positive, bidder returns are negative and the same across time, and the combined firm returns are significantly positive but indistinguishable across time.

Prior research clearly suggests that in calculating cumulative abnormal returns for target firms, a longer event window is needed to capture run-up prior to the merger announcement. Nonetheless, there is concern about using this longer window in calculating bidder returns. Combining the 36-day window for target firms and 11-day window for bidders, combined firm returns are statistically positive and significantly greater in the 1990s than in the late 1980s.

These results suggest that bank mergers occur for synergistic reasons and not because of empire building alone. Moreover, analysis across the three time periods imply that the deregulation of the banking industry has not had a negative effect on banks and add further support to the synergy interpretation of bank mergers. However, bidder returns are sensitive to the length of the event window implemented. The use of 11-day window returns still suggests that bank mergers create positive wealth effects and occur for synergistic reasons (combined firm returns are statistically positive), but bidders may overbid in order to obtain these gains.

Finally, while results from the 1990s indicate that mergers create positive wealth effects (regardless of the event window), it is possible that these higher returns are due to changing aspects of the mergers (for example, method of payment, multiple bids, geographic location, etc.). As a result, I provide cross-sectional sensitivity analysis to examine the sources of patterns in intertemporal returns and to ensure that results from the 1990s are robust. Results demonstrate that the method of payment or number of bids per merger alone do not account for the variation in returns over time. However, examination of mergers by geographic location does suggest that returns are related to whether the merger occurs within the target's home state. Future work should also examine more closely the effects of board structure, compensation, and other variables. Nonetheless, the overall results appear consistent. The wealth effects from bank mergers are positive over time and particularly in the 1990s.

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References

- Amihud, Y., Lev, B., Travlos, N.G., 1990. Corporate control and the choice of investment financing: the case of corporate acquisitions. *Journal of Finance* 45, 603–616.
- Canina, L., Michaely, R., Thaler, R., Womack, K., 1998. Caveat compounder: a warning about using the daily CRSP equal-weighted index to compute long-run excess returns. *Journal of Finance* 53, 403–416.
- Cornett, M.M., De, S., 1991. Common stock returns in corporate takeover bids: evidence from interstate bank mergers. *Journal of Banking and Finance* 15, 273–295.
- Crawford, A.J., Ezzell, J.R., Miles, J.A., 1995. Bank CEO pay-performance relations and the effects of deregulation. *Journal of Business* 68, 231–256.
- DeLong, G.L., 1999. Stockholder gains from focusing versus diversifying bank mergers. *Journal of Financial Economics*, to be published.
- Hawawani, G., Swary, I., 1990. Mergers and Acquisitions in the U.S. Banking Industry: Evidence from the Capital Markets. North-Holland, Amsterdam.
- Houston, J.F., Ryngaert, M.D., 1994. The overall gains from large bank mergers. *Journal of Banking and Finance* 18, 1155–1176.
- Houston, J.F., Ryngaert, M.D., 1997. Equity issuance and adverse selection: a direct test using conditional stock offers. *Journal of Finance* 52, 197–219.
- Houston, J.F., James, C.M., Ryngaert, M.D., 1999. Why are value enhancing mergers in banking so hard to find? Working Paper.
- Hubbard, R.G., Palia, D., 1995. Executive pay and performance: evidence from the U.S. banking industry. *Journal of Financial Economics* 39, 105–130.
- James, C., Wier, P., 1987. Returns to acquirers and competition in the acquisition market: the case of banking. *Journal of Political Economy* 95, 355–370.
- Jarrell, G.A., Brickley, J.A., Netter, J.M., 1988. The market for corporate control: the evidence since 1980. *Journal of Economic Perspectives* 2, 49–68.
- Jensen, M.C., 1993. Presidential address: the modern industrial revolution, exit, and the failure of internal control systems. *Journal of Finance* 48, 831–880.
- Jensen, M.C., Ruback, R.S., 1983. The market for corporate control: the scientific evidence. *Journal of Financial Economics* 11, 5–50.
- Malatesta, P.H., 1983. The wealth effect of merger activity and the objective functions of merging firms. *Journal of Financial Economics* 11, 155–181.
- Martin, K.J., 1996. The method of payment in corporate acquisitions, investment opportunities, and management ownership. *Journal of Finance* 51, 1227–1247.
- Mitchell, M.L., Mulherin, J.H., 1996. The impact of industry shocks on takeover and restructuring activity. *Journal of Financial Economics* 41, 193–229.
- Neely, W.P., 1987. Banking acquisitions: acquirer and target shareholder returns. *Financial Management*, 66–74.
- Roll, R., 1986. The hubris hypothesis of corporate takeovers. *Journal of Business* 59, 197–216.

- Trifts, J.W., Scanlon, K.P., 1987. Interstate bank mergers: the early evidence. *The Journal of Financial Research* 10, 305–311.
- Travlos, N.G., 1987. Corporate takeover bids, method of payment, and bidding firms' stock returns. *Journal of Finance* 42, 943–963.
- Weston, J.F., Chung, K.S., Siu, J.A., 1998. *Takeovers, Restructuring, and Corporate Governance*. 2nd edn. Prentice-Hall, Englewood Cliffs, NJ.