

**“WEALTH EFFECTS OF TRADABLE SECURITIES IN PURE
STOCK-FOR-STOCK MERGERS”.
EVIDENCE FROM LARGE BANK MERGERS.**

by

Wanda Lee Owens

(Under the Direction of Jeffry Milton Netter)

ABSTRACT

This paper examines the effect of mergers on the publicly traded debt and equity securities of 20 acquirer banks and 23 target banks participating in mergers over a three year period from 1994 through 1996. Using a valuation prediction error methodology to compute abnormal returns, I examine the wealth effects of mergers on the preferred stock, common stock, and corporate debt securities of the merging banks. Results document the presence of significantly positive abnormal returns to the bondholders of the target and acquirer banks thus supporting coinsurance of debt theory. Returns to the common stock of the target bank and to the combined sample are positive and insignificant and returns to the acquirer banks are negative and insignificant. Returns to the preferred stock of the target bank, the acquirer bank, and the combined sample are positive and insignificant. Results document positive and significant net synergistic gains to the combined security sample (synergy hypothesis). Results do not indicate any wealth redistribution between the security classes.

INDEX WORDS: Mergers and acquisitions, Banks, Pure Stock Exchange Mergers, Preferred Stock valuation, Bond valuation, Wealth Redistribution effects, Coinsurance effects.

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CHAPTER 1

INTRODUCTION

Research on the role of mergers suggests that mergers and acquisitions can serve to correct imperfections within the capital markets. Competitive forces may fail to completely weed out firms that operate suboptimally. Due to a separation of ownership and control, managers may choose investment opportunities that benefit the manager but that do not maximize the return to stockholders of the firm (agency theory). But these market imperfections can be eliminated through a well-functioning market for corporate control. Suppose an outside interest sees that a firm is being operated suboptimally, or that there exists net synergies that can be exploited through the acquisition of the firm. The outside interest can simply bid on a controlling stake in the firm, take the company over, and enforce new profit maximization policies for the firm. Thus a strong corporate control market protects shareholders from declines in value due to mismanagement and waste and helps to ensure that firms will be operated to generate wealth maximization to its residual claimants.

Since mergers aid in the wealth maximization of the firm, the market should positively receive the merger announcement. But what has been the empirical evidence associated with mergers? Have mergers increased wealth to security classes of the merging firms, or have mergers redistributed or reduced wealth of the claimants of the bank.

Several academic studies document the returns to bidding and target firms at the announcement of bank mergers. Studies by **Neely (1987)**, **Cornett and De (1991a)**, and **Houston and Ryngaert (1994)**, document positive returns to target banks at the announcement of a merger. But studies that address the returns to acquiring banks have produced mixed results. **Desai and Stover (1985)**, **James and Weir (1987)**, and **Cornett and De (1991a)** document positive abnormal returns to bidding firms at bank merger announcements. In contrast, **Neely (1987)**, **Houston & Ryngaert (1994)** and **Cornett & Tehranian (1992)** report negative returns to acquiring banks. The differences in results may be due to the varying time periods covered, the use of different event periods, the study of bids versus completed acquisitions, and the limited sample size of some of the studies. As well, **Cornett and Tehranian (1992)** and **Houston and Ryngaert (1994)** emphasize larger acquisitions in their studies which results show are more negatively perceived by the market.

A more recent study by **Becher (2000)** analyzes a much larger sample of bank mergers over a more extended period of time and documents significant financial gains to the target and the combined firm at the announcement of the merger. He also finds that returns to bank mergers in the 90s are significantly improved over the gains experienced in the mid-80s.

The theory of mergers based on wealth maximization (synergy) predicts that managers will choose acquisitions that enhance firm value. Mergers that create synergies between two firms, by reducing the cost of doing business or by increasing revenues should experience abnormal increases in post-merger cash flows. If the merger is perceived as value enhancing by the market, common stockholders, as the residual

claimants, should realize significant wealth gains in anticipation of the expected increase in cash flows.

In contrast, managers may choose acquisitions that maximize growth for the firm, rather than firm value. These acquisitions, which are value reducing, can be due to management's desire for empire building or entrenchment (agency) or simply due to poor acquisition choices by management (hubris). Mergers that do not create synergies between firms may result in a reduction in the expected cash flows of the firm. This reduction in expected cash flows will be negatively perceived in the market and common stockholders, as the residual claimants, should realize significant wealth losses in anticipation of the expected reduction in cash flows.

A third possibility exists that acquisitions by firms are neither wealth enhancing, nor wealth reducing. Acquisitions do not create synergistic gains nor destroy wealth. Rather mergers may cause a redistribution of wealth between the various claimants of the firms. The result is a zero sum game proposition, which creates wealth for one class of security holders at the expense of the other.

In my analysis of the wealth effects of bank mergers, I will examine pure stock-for-stock mergers in the banking industry during the period from 1994 through 1996. The sample is restricted to stock exchange mergers for two reasons. Firstly, the assets of the firm are not affected by a cash outflow associated with the merger. Thus, the total value of the merged firms' securities should equal the combined value of the two firms' securities after adjusting for overall market movements. Any increase (decrease) in the actual value of the firms' securities will support the synergy (agency) hypothesis for mergers.

Secondly, analyzing stock-for-stock mergers allows me to evaluate the wealth changes to the acquiring and target bank shareholders. When debt or cash are used as the medium of exchange in a merger, the shareholders of the target firm are extinguished as a result of the merger. But in a stock-for-stock merger, the target shareholders receive a portion of the shares of the merged entity. This purchase mechanism allows me to compare actual post-merger values of the firm to predicted values for the individual firms had they not merged. It also allows me to see any wealth redistribution between firms and among the varying security classes.

The dissertation is organized as follows: Chapter 2 provides a review of the relevant research on merger regulation in the banking industry, theoretical motives for mergers, and empirical research on corporate and bank mergers, Chapter 3 discusses the research question and hypotheses to be tested, Chapter 4 describes the methodology used to test the hypotheses, Chapter 5 discusses the data selection criteria and provides a descriptive of the sample, Chapter 6 presents empirical results and Chapter 7 concludes the dissertation and recommends areas for continued research.

CHAPTER 2

REVIEW OF EXISTING RESEARCH

There has been extensive theoretical and empirical academic research to explain the motives for mergers and acquisitions. This chapter will review the theoretical motives for mergers, examine the changing regulatory climate of the banking industry and how the changing regulatory environment has affected bank merger activity, and survey existing merger empirics of corporate and financial institutions.

2.1 Theories on Corporate and Bank Mergers

There are many theories to explain the merger phenomenon. In this chapter I will present the synergy, agency, and hubris theory for mergers and the expected returns to target and acquiring firms under each of the theories. I will also investigate the theoretical implications of mergers to the debt claimants of the firm (coinsurance of debt theory), and theories on wealth transfer between security classes (wealth redistribution theory).

2.1.1 The Synergy Theory

The synergy theory states that managers of target and acquiring firms are rationale and managers make decisions that are in the best interest of the firm's existing stockholders. The goal of the firm is to maximize wealth to its residual claimants; thus the managers of target and acquiring firms will engage in only those acquisitions that result in positive returns to both the target and acquiring shareholders. Therefore, for takeovers motivated by synergy, the target, acquiring, and combined firm should experience positive abnormal returns as a result of the merger.¹

¹ See Berkovitch and Narayanan (1993) for elaboration on this point.

2.1.2 *The Agency Theory*

Jensen (1986) indicates that managers, as agents to shareholders, have incentives to grow their firm beyond its optimal size. Since manager's power, and compensation, increases as more resources come under its control, managers may be motivated to make acquisitions that are not in the firm's best interest. For instance, managers may elect to make acquisitions that increase the firm's dependence on the manager's own skills, thus entrenching his position in the firm.² This incentive is exacerbated when the firm has internal resources available for acquisitions and is not subject to the rigorous monitoring of the capital markets. Through internal financing managers can fund projects that improve the manager's position in the firm rather than the position of the residual claimants.

Acquisitions motivated by agency result in negative total gains to common stockholders and negative gains to the stockholders of the acquiring firm. Returns to the target stockholders are expected to be positive as wealth is expropriated from the acquiring to target bank stockholders. The size of target returns is negatively correlated to total gains; the greater the gain to target stockholders the lower the total gain.

2.1.3 *The Hubris Hypothesis*

Roll (1986) advances the hubris hypothesis to explain the motive for mergers. He states acquisitions by managers are not motivated by a nefarious attempt at empire building. Manager's decisions to merge or to acquire a firm are motivated by a genuine attempt to increase value to the residual claimants of the firm. Managers choose acquisitions that they believe will result in a positive return to the stockholders, through the exploiting of potential synergies or economies of scale between the target and acquiring firms. The manager of the acquiring firm believes that these synergies can be realized through the acquisition and superior management of the target firm's resources.

² See Shleifer and Vishny (1989) for elaboration on mergers and management entrenchment.

In order to acquire the target firm and realize these financial synergies, the acquiring firm pays a premium above the current market price for the target firm's stock.

But suppose managers inaccurately measure any potential synergy, or suppose they predict synergies where none exists. The price the acquiring firm pays for the target firm will exceed the value of the acquisition. The result is an expropriation of wealth from the acquiring to the target firm's shareholders. The total combined takeover gain to the target and acquiring firm is expected to be zero.

2.1.4 Coinsurance of Debt and Wealth Transfer Effects

Lewellen (1971) contends that while there may exist no exploitable synergies between the target and acquiring firm, there may exist a financial incentive to warrant merger or acquisition activity. By combining two firms whose cash flows are less than perfectly correlated, managers can reduce the default risk and increase the total borrowing capacity of the combined firm (coinsurance of debt). The increased debt capacity also reduces the weighted average borrowing cost of the combined firm since interest payments on debt are tax deductible. Lewellen concludes that firms may participate in non-synergistic mergers to take advantage of financial incentives, and that financial mergers will result in positive abnormal returns to the firm.

Higgins and Schall (1975) evaluates the theoretical effect of the financial merger on the tradable securities of the firm and show bond prices will generally rise and stock values decline as a result of the merger. Since no synergistic gains are expected as a result of the merger, the total firm value of the combined firm is simply the value of the two individual firms. With a reduction in the default risk of the debt, there is a corresponding increase in the debt's market value. Any gains in value to the bondholder will be offset by a decline in the value of the combined firm's common stock. Thus the net financial result of the merger is a redistribution of wealth from the stockholders to debt holders. **Galai and Masulis** (1976) and **Higgins and Schall** show that wealth transfer can be reduced through the recapitalization of the firm such that the risk of debt

is unaffected by the merger. **Shastri** (1990) shows that the degree of wealth transfer is dependent upon the firm's level of leverage, the maturity structure of the debt, and the variance of the firm's cash flows. He finds that wealth transfer can occur not only across, but also within security classes.

2.2 Banking Industry Regulatory Perspective

For much of this century, bank regulation sought to shelter banks and the banking industry from excessive levels of competition. Federal statutes have constrained individual bank expansion by limiting the permissible product lines and geographic reach of U.S. banking organizations. It is commonly indicated that regulations restricting business activity and geographic expansion in the banking industry were enacted to lessen the incidence of insolvency and to promote public confidence in banks and other depository-type financial institutions. Interest rate restrictions limited the extent to which banks could compete for funds and prohibited banks from engaging in activities believed to risky, such as the underwriting of stock issuance. But many researchers believe that restrictions on bank product lines and geographic diversity were enacted to restrain market and political power associated with increasing bank size. By limiting bank expansion through regulation, the result was the preservation of monopolies or oligopolies within geographic markets.³

The early history of banking in the United States was characterized by an absence of nationwide banking. Prior to transcontinental railroads and telegraph networks, banking markets were naturally fragmented by the high cost of transportation and information costs of booking and managing interstate banking. In 1791, the First Bank of the United States received a national charter, which allowed it to operate branches across the nation. The charter for the First Bank of the United States was not renewed, and in 1816 the Second Bank of the United States was formed, but its charter was allowed to

³ Kane (1996), Maggs and Pate (1995), and Palia (1994) provide a review of bank regulatory environment and the progression of the industry to interstate banking.

expire in 1836. Though both the country's first and second chartered bank had multiple branches, the offices were organized and operated as corporate subsidiaries, rather than as centrally controlled satellite offices. But nationally chartered banks had a branching advantage over state chartered unit banks, since the state chartered unit banks were restricted to the operation of a single office.

Federal prohibition of interstate banking developed as a complement to older state-by-state restrictions on a bank's authority to operate more than one office. The first legislative act to implicitly address the issue of interstate banking was The National Banking Act (NBA) of 1864. The NBA governed the process of obtaining a national bank charter. Though not explicitly set forth in the document, the act as interpreted by the Comptroller of the Currency, and as further supported by the U.S. Attorney General, limited national banks to a single location. The act "grand-fathered" existing state chartered banks that had previously established branches. But though state chartered banks were given the authority for branch banking, the U.S. banking system continued to operate in a unit-banking environment.

In 1927, the McFadden Act was passed by Congress to clarify the extent to which national banks were permitted to branch. According to this act, national banks were given permission to branch within the city limits of their home bank offices if state banks were allowed the same opportunity. Until the McFadden Act allowed within-city branching, a national bank could have full service branches only by starting out as a state chartered bank, opening branches, and then converting to a national charter, or through absorbing other national banks that already had branches. But since most of the states were "unit bank" states (27) which prohibited state banks from holding more than one office, the McFadden Act served to set the tone for significant geographical impediments on interstate branching that occurred over the next 60 years.⁴

⁴ Maggs and Pate (1995).

The Banking Act of 1933 gave a national bank the same branching rights within its home state as the rights afforded state-chartered banks. This effectively ceded to the individual states the right to prescribe branch-banking rules within their particular state. By 1933, the number of states that prohibited branch banking had been reduced from 27 to eleven, with seventeen additional states allowing limited branch banking. But even with a relaxation of the regulation, many states limited a bank to operating either out of a single office or a network of offices located within some prescribed range.

Innovations in transportation and communication destroyed the natural barriers to entry into markets that geographic distance once provided. Innovations in contracting, information processing, and communication overcame the statutory barriers that were erected to replace the natural ones. But despite the passage of the Banking Act in 1933, which placed restrictions on the extent to which holding companies could engage in underwriting activity, banks took advantage of loopholes in the legislation to expand their business through the formation of bank holding companies.

A multi-bank holding company (MBHC) is a collection of separately incorporated banks that have a common corporate ownership and whose operations and management are linked closely with that of the lead bank.⁵ The MBHC developed around the turn of the century but fully came into prominence in the 1920s to circumvent the branching restrictions established by the McFadden Act. Applicable state and federal statutes typically allowed a bank holding company to locate subsidiary banks in jurisdictions where the law prohibited branch banking by the lead bank. Though each bank had to be individually capitalized, and required its own board of directors, the use of the MBHC framework allowed bankers to operate their subsidiaries as a branch network.

In 1956, the Bank-Holding Company (BHC) Act was passed. This act, and a package of 1970 amendments, placed restrictions on further bank acquisitions, but

⁵ Kane (1996)

existing organizations were again "grand-fathered" and one-bank holding companies continued to be permissible by law. In particular, the Douglas Amendment prohibited MBHCs from controlling banks outside of their home states except in states that elect explicitly to authorize an out-of-state holding company to exercise cross-state control. But though the act effectively prohibited MBHCs from acquiring additional banks outside of their home state, the act allowed MBHCs to open credit card operations, and consumer and mortgage finance offices, again allowing a loophole for continued business across state lines.

The BHC Act left to the states the decision of whether to allow out-of-state holding companies to own banks not "grand-fathered" by the 1956 Act. States first began to liberalize their barriers to geographic expansion through the relaxation of intrastate banking regulations, which effectively expanded or eliminated geographic branching restrictions on in-state banks. In 1984, branch banking was prohibited in only 8 states, and 18 other states significantly limited the number of branches and the geographic area. Since that time, all of the states have eliminated or significantly curtailed their intrastate bank branching restrictions.

One of the primary catalysts to the easing of barriers in mergers and acquisitions in the interstate banking market is the failure of the Savings and Loan industry. For insolvent banks and thrifts, interstate barriers were repeatedly breached to generate willing merger partners and acquirers. In 1994, the Riegle-Neal Interstate Banking and Branching Efficiency Act (IBBEA) was established to make the federal treatment of interstate expansion more consistent with the current realities of the banking and financial services market. The IBBEA provides four (4) ways in which banks may exercise an interstate presence:

1. Acquisitions - For adequately capitalized and well managed banks, the IBBEA repealed the Douglas Amendment effective September 29, 1995, thus allowing

out of state acquisitions of banks, subject to the acquirer not controlling more than 10% nationally, and 30% locally, of federally insured deposits.

2. Interstate Agency Authority - Also effective September 29, 1995, any bank subsidiary of a BHC may receive deposits, renew time deposits, close loans, and receive payments on loans or other obligations as agent for any bank without being considered a branch of the affiliated. This allows a bank affiliate to perform virtually all of the important front office work for a lead bank that a retail bank branch might do, without having to convert ownership structure to that of a branch bank.

3. Consolidation of Acquired Banks into Branches - As of June 1, 1997, the IBBEA gives MBHCs the right to merge their acquired banks across state lines, unless prior to the June 1st activation day, the bank's home state enacts legislation "opting out" of this provision.

4. De Novo Interstate Branching - IBBEA authorizes de novo interstate branching into any state that by July 1, 1997 enacts statutes expressly empowering an out-of-state bank to charter a new branch office in state.

Thus, with the passage of the IBBEA, most barriers to intra- and interstate banking were lifted and passage of the bill should result in a further reduction in the number of independent banking organizations, through continued merger consolidation.

2.3 Empirical Evidence on Corporate Mergers

There have been exhaustive studies on the effects of mergers on the returns of the common stock of the target and acquiring firms. This section provides evidence of the effect of mergers to the target, acquiring, and combined firm around the announcement date. I also investigate the long-term stock price effect of mergers, and the post merger operating performance of the combined firm. Evidence on the medium of exchange and the effect of mergers on the debt and preferred securities of the target and acquiring firm are also presented.

2.3.1 Returns to Target Firms

Jensen and Ruback (1983), and **Jarrell, Brickley, and Netter (1988)** provide a comprehensive review of research in the area of mergers and acquisitions in the non-financial industry. **Jensen and Ruback** provide a weighted average return to targets from the results of the various studies, which indicate that stockholders of target firms experience an average abnormal return of 29.1% in successful tender offers and 15.9% in mergers. The returns to target stockholders at the announcement of a merger are lower than the returns in successful tender offers because mergers are usually negotiated friendly transactions, whereas tender offers are unsolicited bids.

Extensive research has been conducted on the returns to target firms at the announcement of a proposed merger. Results show that target firms consistently experience positive abnormal returns from mergers and tender offers. **Bradley (1980)**, one of the earliest papers to study tender offers and stock price effects, documents empirical results which show that target stockholders realize a significant capital gain at the announcement of a tender offer. **Bradley** derives a model to explain the tender offer process, which shows that in order to be successful in a tender offer, the bidding firm must pay a premium for the target shares that they purchase. That premium must be greater than the expected value of the target firm's share were it to reject the tender offer. In other words, the tender offer must exceed the expected value of the target firm if it maintained the status quo.

To test the model, **Bradley** investigates successful and unsuccessful cash tender offers over the period from 1962 through 1977. He finds that on average, bidding firms pay target stockholders a 49% premium for the shares purchased in a successful tender offer. This is 13% higher than the 36% appreciation in stock value for the target firms post- execution. For unsuccessful tender offers, the price appreciation of the target firm post- acquisition is 67%, which is greater than the average rejected offer premium of 52%. Thus the results support **Bradley's** model. **Bradley** finds that target shareholders

react positively to a tender offer (accept the offer), only when that offer exceeds the expected per share value of the target's resources in their present or next best allocation.

Asquith (1983) and **Asquith, Bruner, and Mullins** (1983) extend the research on successful and unsuccessful tender offers conducted in **Bradley** (1980). **Asquith** (1983) examines the same time period as that studied in **Bradley's** analysis, but concentrates his study on successful transactions where the target firm is 100% acquired by the successful bidding firm. **Asquith's** analysis also restricts its sample to include only cash tender offers, whereas **Bradley** includes partial acquisitions and non-cash transactions in his analysis.

Though results are not as significant as those found in **Bradley** (1980), **Asquith** shows that both successful and unsuccessful target firms benefit at the announcement of a tender offer. Successful and unsuccessful targets of a tender offer receive abnormal returns of 6.2% and 7.0%, respectively, at the tender offer announcement date. But the returns are not found to be significantly different from zero, indicating the market is not initially able to discern which transactions are more likely to be consummated. In contrast to **Bradley's** findings, **Asquith** (1983) finds that abnormal returns are negative for target firms in unsuccessful tender offer. In fact, **Asquith** finds that though the market couldn't initially tell the difference between a successful and unsuccessful tender offer, the market quickly becomes aware of the probability of success of the transactions. **Asquith** documents that during the period from post announcement to the outcome date, unsuccessful transactions experience negative abnormal returns of over 8%, whereas the target firms with successful tender offers continue to experience positive abnormal returns. Target firms that are not acquired continue to have negative abnormal returns, which are significant for up to a year after the end of the merger bidding process.

Asquith, Bruner, and Mullins (1983) focus primarily on returns to bidding firms in tender offers but do make an analysis of a smaller sample of target firms of the merger bids specifically analyzed. Similar to the results found in earlier research by **Asquith**

(1983), **Asquith, et. al.** find that the average 2-day announcement return is 9.6% and the 21-day cumulative excess return is 16.8% for all target firms in the analysis. They also find that, on average, target firms receive an additional 10.7% in excess returns for bids that are eventually successful, and that post- outcome, the target of an unsuccessful merger bid experiences negative abnormal returns at the announcement of the merger withdrawal.

Later papers by **Bradley, Desai, and Kim** (1988), and **Berkovitch and Narayanan** (1993) also find positive abnormal returns to targets. **Bradley, Desai, and Kim** (1988) extend the data used in **Bradley** (1980) to further evaluate tender offer premiums. Using successful tender offer data for the period from 1963 through 1984, **Bradley, Desai, and Kim** find that the announcement of a tender offer has a positive effect on the stock price of the target firm. They find that the value of the target firm increases 31.77% at the announcement of a tender offer, and that 95% of target firms experience an increase in the value of their stock when a tender offer is announced. They also find that the presence of multiple bidding firms increases target stockholder prices above the level experienced when there is only one bidding firm in the tender offer process. **Berkovitch and Narayanan** (1993) quantify the effect of the tender offer to the target firm. They find that target firms experience a mean gain of \$130 million at the announcement of a tender offer, and that 95.8% of target firms experience positive abnormal returns at the announcement of the tender offer.

2.3.2 Returns to Bidding Firms

Research on returns to bidding firms at the announcement of a merger or tender offer are not as definitive as the results found for target firms. **Bradley** (1980) explores the stock price effect to the bidding firms and finds that bidding firms realize an excess capital gain of 4% at the announcement of a tender offer. The positive abnormal return is maintained for successful tender offers post- acquisition, even with the significant premium needed to acquire the shares. Unsuccessful bidding firms realize negative stock

price effects for failed tender offers; the author attributes the decline in stock price to legal, filing, and advertising expenditures associated with the merger bid.

Asquith (1983) also evaluates abnormal returns to the bidding firm in successful and unsuccessful tender offers. The market shows little reaction to the announcement of a tender offer for both successful and unsuccessful tender transactions. Bidding firms appear to have small but insignificant positive returns at the announcement date, and the market is initially unable to determine the probable success of the merger. But post announcement, the probability of the tender offer being successful becomes more exact, and the market reacts to this difference. Whereas the shares of successful bidding firms continue to be unaffected during the negotiation period, the shares of the unsuccessful firm start to decline in value. The stockholders experience significantly negative abnormal returns as uncertainty is reduced and it becomes more apparent that the transaction will not be consummated. At the outcome date, both the successful and unsuccessful bidding firm experiences insignificant returns because uncertainty has been fully reduced during the negotiation period. Once the transaction is consummated, the stock of both the successful and unsuccessful bidding firm again begin to perform similarly, where both experience negative abnormal returns over the year preceding the consummation or the termination of the transaction.

Asquith, Bruner, and Mullins (1983), and **Berkovitch and Narayanan** (1993) both find results more consistent with those found in **Asquith** (1983). **Asquith, Bruner, and Mullins** (1983) confine their study to the announcement and outcome period of the merger, and investigate the effect of a merger program on the shares of the bidding firm. Using event study and regression analysis, **Asquith et. al.** find positive abnormal returns to the bidding firm at the announcement of a merger. They also find that returns are greater for bidding firms prior to the enactment of regulation which restricted merger transaction, are greater when the target and bidding firm are of similar size, and are greater for those transactions that are ultimately successful. Consistent with **Asquith**

(1983), **Asquith et. al.** find that shareholders of successful bidding firms receive insignificant excess returns on the merger date, and unsuccessful bidding firms receive negative excess returns on the day their merger bids are terminated.

Berkovitch and Narayanan (1993) quantifies the return to the acquiring firm in tender offers, and document that about one-half of the acquiring firms experience positive abnormal returns. Overall, their analysis shows that the acquiring firms experience a \$10 million loss at the announcement of a merger. They also determine that when there are multiple bidding firms in the transaction, the successful bidding firm experiences an even greater loss in stock price. This loss is easily attributable to the higher premium necessary to secure the transaction.

In contrast to the results of **Asquith** (1983), **Asquith, et. al.** (1983), and **Berkovitch and Narayanan** (1993), **Bradley, Desai, and Kim** (1988), in their analysis of successful tender offers, find that the value of the acquiring firm increases almost 1% at the announcement of a merger, and that 47% of the acquiring firms experience positive abnormal returns.

2.3.3 Combined Returns

Bradley, Desai, and Kim (1987) and **Berkovitch and Narayanan** (1993) both provide information on how firm's shares perform on a combined basis. **Bradley, et. al.** documents that the combined value of the target and acquiring firm increases 7.43% at merger announcement, and that 75% of the transactions have positive combined revaluations. They also show that post- merger, the combined firm's stock price performs better than the target firm's stock price performed prior to the merger. Based upon these results, **Bradley et. al.** determines that mergers are motivated by synergistic reasons and are positive transactions for the shareholders of the target and acquirer.

Berkovitch and Narayanan (1993) findings also showed net synergistic gains from the merger. **Berkovitch and Narayanan** find that the average gain to the combined

firm at a merger announcement is \$120 million, and that 76% of the transactions experience positive gain on a combined basis.

2.3.4 Long-Term Returns to Shareholders

Franks, Harris & Titman (1991) and **Agrawal, Jaffe, & Mandelker** (1992) both analyze the long-term abnormal share price returns for acquiring firms, but yield differing results. **Franks, et. al.**, analyze excess returns to acquiring firms using various benchmarks for the market portfolio. The sample consists of 399 NYSE and AMEX firms, that made acquisitions between the years 1975 to 1985. The authors determine that returns to bidding firms are different depending upon the index utilized. When using a CRSP value weighted, or equally weighted index as the market portfolio, the authors generate mixed results for returns to bidding firms (0.3% and -0.2% per month, respectively). The authors then evaluate returns based upon an eight (8) portfolio benchmark, and a 10 factor benchmark. Using the revised benchmarks as the market portfolio, the authors determine that the returns to shareholders of acquiring firms are in line with the returns to the market. The authors also evaluate returns by size and medium of exchange. Contrary to previous research, they determine that when using the revised benchmarks, acquiring firms do not under perform the market. Based upon their findings, the authors conclude that benchmark methodology error accounts for the negative abnormal returns to the acquiring firms in previous research, and that acquiring firms long term returns are commensurate with the returns to the market.

Agrawal, Jaffe, & Mandelker (1992) also conduct a study of the long term post-merger performance of acquiring firms, and observes results that are significantly different from those found in **Franks, Harris, & Titman** (1991). In this analysis, the authors analyze the cumulative abnormal returns to acquiring firms over a five-year period post- merger, for 937 mergers and 227 tender offers that occur over a 23-year period. The analysis determines that acquiring firms suffer a statistically significant loss of over 10% over the five-year post- merger period, which loss can not be explained

through changes in firm size or risk. The author's results are in sharp contrast to **Franks, et. al**, which conclude normal long term returns to the shareholders of the acquiring firms. To try to ascertain the differences in their results from the results found in **Franks, et. al**, the authors divide the data by date of acquisition into 5-year sub-periods, and determine that during the period from 1975 to 1979 post- merger price performance was significantly positive. This was the only period in which the acquiring firms had positive abnormal returns, and the period accounts for half of the sample period used in the **Franks, et. al** study. As this is the only period with positive post merger performance, **Agrawal, et. al** determine that the **Franks, et. al** results are specific to their sample, and that their analysis more accurately reflects the long term return to shareholders of the acquiring firm.

2.3.5 Effect of Medium of Exchange

Several empirical studies have been conducted that examine the effect of the medium of payment on abnormal returns in merger and tender offers. Results from these analyses show that returns to the target and acquiring firms are affected by the exchange medium, and that cash acquisition are more positively viewed by the market.

Travlos (1987) explores the method of payment in explaining common stock returns of bidding firms at the announcement date. The author evaluates the two- (2) day returns for bidding firms based upon the acquisition method (cash, stock exchange, or combination cash and stock exchange) and whether the acquisition is a merger or a tender offer. **Travlos** determines that stock and combination stock and cash transactions result in negative abnormal returns to the bidding firm, but the bidding firm experiences normal returns for both merger and tender offers when cash is the medium of exchange. **Travlos** then conducts a cross sectional regression analysis, and determines that the proportion of stock used in the acquisition is the only variable of significance in explaining returns to the bidding firm in a merger. His results are consistent with **Myers** (1977) study on the informational effect of the form of financing.

Peterson and Peterson (1991) examine the role of medium of exchange and wealth distribution between acquiring and target firms. The authors evaluate the wealth changes for shareholders of the bidding and target firms for 242 mergers consummated over a four-year period ending in June 1986. The authors determine that overall, target firm's shareholders gain at the expense of the acquiring firm's shareholders, and the gain occurs whether the medium of exchange is cash, stock, debt, or a combination thereof. As in **Travlos** (1987), the authors determine that cash exchanges appear to provide better returns for acquiring firms. But after controlling for tax and signaling implications associated with the gain, the authors determine that cash transactions did not provide acquiring firms' shareholders with better returns than stock exchanges.

Sung (1993) also examines the affects of the form of financing and overpayment (premium on tender offer) on shareholder wealth for bidding firms. The author evaluates 78 cash merger offers, 63 stock exchange merger offers (141 mergers), and 81 cash tender offers. The author determines that overpayments (derived as offer price divided by the target firm's stock price 60-days prior to announcement) and the form of financing are important in explaining cross sectional differences in returns to bidding firms. Consistent with **Myers & Majluf** (1984) pecking order hypothesis, the author determines that firms that are cash rich, relative to their industry, are more likely to choose a cash offer as the method of acquisition financing. Firms that generate normal cash flow levels, relative to the industry, use stock exchange offers as their acquisition vehicle.

Sawyer and Shrieves (1994) categorizes their sample of 377 firms based upon the financial characteristics of the acquiring and target firms, and evaluate the wealth effect of the cash and stock merger transactions for the target and bidding firms. To reduce differences between the firm's being evaluated, the authors separate the firms into smaller sub-samples based upon the firm's financial parameters. **Sawyer and Shrieves** determine where systematic differences in bidding and target firm merger returns existed among the group, and evaluate whether the medium of exchange within the cluster groups

affect shareholder returns. To test for differences the authors subdivided the 804 firms (402 mergers) based upon various financial characteristics including asset size, asset growth rate, pre merger debt to total assets, return on equity, operating profit margin, dividend yield, and a ratio of cash flow to the market value of debt. The authors then analyze the announcement period returns to acquiring and target firms for each of the sub-samples.

Among clusters of target firms, the announcement period returns are positive for all clusters for both cash and stock transactions. But for acquiring firms, abnormal returns are negative or zero for all clusters except small, low growth firms that finance acquisitions through cash. Given the size and makeup of the firms in the small, low growth sub-sample, the authors surmise that these mergers are most likely motivated by achievement of economies of scale, and thus result in net positive return to the bidding firm of 2.0%.

The authors also review the various returns for target and acquiring firms for each cluster group, and based upon these returns, hypothesize the motives for the mergers. The authors conclude that in all but one of the sub-samples, synergy appears to be the motivation for the merger. In the final sub-sample, the returns to target firms are the lowest of all the clusters, and are significantly negative for the acquiring firm's shareholders in both cash and stock transaction; hubris appears to be the motive for these mergers.

Raad and Wu (1994) evaluate abnormal returns to acquiring firms for 105 merger transactions over the period from 1981 through 1986. Using a two-day event window, the authors evaluate abnormal returns to the acquiring firm based upon whether the acquiring firm used stock (43), cash (41), or a combination of cash and stock (21) in the acquisition. For the entire sample, acquiring firms experience negative abnormal returns of .29% at the merger announcement, but the returns held no significance.

Raad and Wu then separate the transactions by medium of exchange. Results indicate that firms using stock to acquire their target experience abnormal losses of 1.76% at the announcement of the merger and the loss in stock value is significant at the 1% level. In contrast, firms that use cash in the acquisition process experience positive abnormal returns of 1.19% at the announcement of the merger, which returns are significant at the 5% level. A review of those transactions that used a combination of cash and stock experienced an insignificant loss in stock value of .19%.

Suk and Sung (1997) evaluate returns to the target firm based upon the method of payment used in the merger and tender offers. The authors evaluated 102 mergers, 64 of which are financed by stock and 38 of which are cash transactions. The authors also evaluate abnormal returns to targets in 103 cash tender offers. Suk and Sung evaluate returns using an event period of 5-days prior to the first takeover announcement through 5-days after the final offer announcement.

For the entire sample of 205 transactions, **Suk and Sung** find that target firms receive announcement period cumulative abnormal returns of 29.5%, and the returns are significant at the 1% level. The returns to targets in cash and stock transactions are both positive and significant, but cash offers yield higher target abnormal returns (33.9%) than stock exchange offers (19.6%). The difference in returns for cash and stock exchange offers is significantly different from zero.

The authors also compare the abnormal returns to the target in the 38 cash and 64 stock exchange merger offers. **Suk and Sung** find that, again, cash offers (26.3%) yield more positive returns than stock offers (19.6%), but the difference in returns is not shown to be significant. The return to target banks in tender offers, at 36.7%, is higher than the returns received in the merger transactions. This result is reasonable since tender offers usually require a higher offer premium than the premium in the negotiated merger transaction.

2.3.6 Determinants of Merger Premiums

Sung (1993) also examines the overpayment of premiums on tender offer, and the effect on the shareholder wealth of bidding firms. The author investigates 78 cash merger offers, 63 stock exchange merger offers (141 mergers), and 81 cash tender offers. The author determines that overpayment ratio (defined as offer price divided by the target firms stock price 60 days prior to announcement) is important in explaining cross sectional differences in returns to bidding firms. Using regression analysis, Sung compares the relationship between abnormal return to the acquiring bank at the merger announcement and the overpayment ratio. He finds that the relationship between abnormal returns and the merger premium is negative and significant at the 1% level. The results indicate that the market responds negatively to the overpayment of the target bank's shareholders.

2.3.7 Post Merger Operating Performance

Due to difficulty in data collection, limited analysis exists on the post acquisition performance of firms using efficiency and operating ratios. One such paper, **Healy, Palepu, and Ruback** (1992) reviews the post acquisition performance of the 50 largest merges that occur during the period from January 1979 to June 1984. **Healy, et. al.** compares the pre- merger operating performance of the target and acquiring firm to the post- merger performance of the combined firm. The authors collect pre- merger cash flow data for the years –5 through –1 and post- merger cash flow data for the years +1 through +5. The authors also collect cash flow information for the industry for the same periods. The authors focus their efficiency analysis on cash flows, because they feel cash flows more accurately represent the actual economic benefit generated by the assets of the firm. The authors evaluate the ratio of pre-tax operating cash flow to total assets for the sample firms. Pretax operating cash flows is defined as sales, minus cost of goods sold and selling an administrative expenses, plus depreciation and goodwill expenses. Pretax operating cash flow is then divided by the market value of total asset (market value of

equity and debt) to derive an operating return on investment. This measure of operating performance is unaffected by depreciation, goodwill or the financing method used to fund the acquisition. Thus changes in this measurement should provide an accurate indicator of any productivity/efficiency effects that result from the merger.

Based upon the authors review of pre- and post- merger cash flows, **Healy, et. al.** determine that operating returns are higher for the combined target and acquiring firm prior to the merger, than the operating returns received post- merger. The authors compare the pre- and post- merger returns of the firms, to industry returns over the same period. Prior to the merger, the return to the combined firms is comparable to the industry. But post- merger results indicate that operating returns are greater for the merged firm than the returns to the industry. Overall, the annual median return for the 50 merged firms over the five-year post- merger period are approximately 19% greater than the average industry return. Thus, **Healy, et. al.** findings indicate that merged firms have significant improvement in operating cash flow returns after the merger, and the improvement is attributable to increases in asset productivity, relative to their industries.

Phillipatos and Baird (1996) extend the research conducted in **Healy, Palepu and Ruback** (1992) on operating performance of merged firms by comparing the pre- and post- merger performance characteristics of acquiring and target firms. The sample consists of 71 mergers and tender offers completed during 1973 through 1987. The authors hypothesize that firms that out perform the industry (better performing firms), can create value by acquiring poorly performing companies and then improving the operating performance of the target post-merger.

Using regression analysis, the authors examine the relationship between pre- and post- merger performance of the combined firms. **Phillipatos and Baird** compute the change in the merging firm's combined excess value (defined as market value minus book value) pre- versus post- merger. The authors then compute profitability and value ratios for the target and acquiring firm. The change in excess value is then regressed

against profitability characteristics of the target and acquiring firm. Based upon the results of the regression analysis, the authors conclude that pre- merger, the acquiring firms perform no better than the firms they acquire, nor do they perform better than firms in the industry that are not in the acquisition market. As well, they find that those firms that are better performing pre- merger do not appear to make better acquisition choices, and are not able to realize improved performance in their acquisitions post- merger. Thus the authors conclude that those firms in the acquisition market show little ability to choose under performing firms, and once acquired, are unable to create added value through superior management.

Switzer (1996) extends research on post- merger operating performance by evaluating 324 mergers that occur between 1967 and 1987. Using **Healy, et. al.'s** measure of operating cash flows, the authors derive a predicted excess return value for the individual firms, assuming the merger did not occur. They then compare the predicted value of excess return to the actual excess returns that the combined firm receives post- merger. Results indicate that operating cash flow returns for the combined firms are larger post- merger than the predicted cash flow returns had the two firms not merged. Consistent with the results found in **Healy, Palepu, and Ruback** (1992), **Switzer** (1996) shows that corporate combination, whether tender offers or mergers, result in improved industry adjusted operating performance.

2.3.8 Coinsurance of Debt and Wealth Transfer Effects

Eger (1983) empirically tests for a wealth redistribution effect in pure stock exchange mergers. Results indicate that bonds experience statistically significant returns at the merger announcement. **Eger** also finds significant positive excess returns for target stockholders and significantly negative excess returns to acquiring firm stockholders at merger announcement.

Datta and Iskandar-Datta (1995) examines the effect of partial acquisitions on bond holder and stockholder securities. The data sample consists of 63 acquisition

announcements by 43 firms over the period from 1982 through 1990. Their results indicate that acquisition announcements produce significantly negative abnormal returns to the debt securities of the acquiring firm. The return to the common stock was positive and insignificant.

Using a much larger sample than that employed in the **Eger** or **Datta and Iskandar-Datta** analysis, **Macquiera, Megginson, and Nail** (1998) examine the change in value of publicly traded debt and equity securities for 260 pure stock-for-stock mergers during the 1963 through 1996 period. In particular, the authors evaluate 1,283 publicly traded debt and equity securities for 520 firms, to determine if certain security classes benefit to the detriment of other security classes in merger and acquisition transactions. They also investigate whether focus- increasing mergers are more positively perceived in the market than are corporate mergers.

The authors compare the post- merger value of the different security classes with a predicted value for the security had the merger not occurred. The analysis determines that mergers result in significant positive abnormal returns to target and acquiring firms, with the target firms capturing much of the gains. The authors also determine that stock mergers are more beneficial to highly levered firms, but find little indication of a wealth redistribution between security classes.

Macquiera, Megginson, and Nail then separate the sample into conglomerate and non-conglomerate mergers, and re-evaluate the actual and predicted values for the different security classes. The authors determine that only non-conglomerate mergers (focus increasing mergers) show net increases in wealth to security holders, thus indicating a positive correlation between firm focus and excess returns. The authors conclude that non-conglomerate mergers are wealth-generating events, and are consistent with the value maximization hypothesis.

In their analysis of the wealth effects of mergers to bondholders, **Billett, King, and Mauer** (2002) document strong evidence of both a coinsurance effect and a wealth

redistribution effect in mergers that occurred in the 1990s. Using a sample of 3,901 bond issues from 940 offers they find that target bondholder excess returns are significantly positive during the announcement period, and that the excess return can be traced to wealth redistribution from target stockholders. They also found average acquirer excess bond returns are significantly negative over the event period.

2.3.9 Summary

Empirical research on the merger of corporate firms indicates that the shareholders of the combined firm experience significantly positive returns at merger announcement. Results show that returns are affected by the medium of exchange used in the merger, and by whether the merger is focus- increasing or focus- reducing. Research also indicates the presence of a wealth redistribution effect between security claimants.

2.4 Empirical Evidence of Bank Mergers

In this section I review empirical research on bank mergers and the affect of mergers on the shares values of the target, acquiring, and combined bank around the merger announcement date. I also investigate the long-term stock price effect of mergers, and the post merger operating performance of the combined firm. Evidence on the medium of exchange and relative size and their affect on abnormal returns are also presented.

2.4.1 Return to Target Banks

Research on bank merger activity initially emphasized returns to acquiring banks due to the limited number of target banks that traded on the NYSE or AMEX.⁶ **Neely** (1987) was the first major paper to extend its analysis to the evaluation of target returns at the announcement of merger. Using weekly data, **Neely** analyzes 26 merger transactions that occur during the period from 1979 through 1985. He finds that at the announcement of a merger, target banks experience positive abnormal returns of 15.04% that are

6 Rhoades (1994) provides a comprehensive review of bank merger papers published from 1980-1993 and compares the use of event study and operating performance methodologies in merger analysis.

significant at the 1% level. In addition to evaluating abnormal returns during the week of the merger announcement, **Neely** also evaluates data over longer event windows. In all cases, the target bank experiences significantly positive abnormal returns.

As did **Neely** (1987), **Trifts and Scanlon** (1987) evaluate abnormal returns to the target bank, but their analysis uses daily return information. **Trifts and Scanlon** (1987) evaluate abnormal returns for 21 merger transactions that occur over a four-year period beginning in 1982. Of the 21 transactions, the authors are able to collect stock price data on 17 target banks. They find that on the day of the merger announcement, the target banks experience positive abnormal return of 7.04%, that are significant at the 1% level. **Trifts and Scanlon** find similar results for targets when evaluating abnormal returns over longer periods of time.

Hannan and Wolken (1989) use a somewhat larger sample in their analysis of abnormal returns to targets. **Hannan and Wolken** (1989) evaluate the abnormal returns of 69 target banks that participate in mergers over the 1982 through 1987 period. Consistent with previous research, targets experience significantly positive abnormal returns of 11.12% over the two-day event period. **Hannan and Wolken** also evaluate cumulative abnormal returns over a 30-day period around the merger announcement. They find that target banks experience cumulative abnormal returns of 14.25% over the 30-day event period, and the returns are significant at the 1% level.

Cornett and De (1991a) evaluate the abnormal returns for 37 targets banks that trade on the NYSE or AMEX, and find results consistent with previous research. Stockholders of target banks receive abnormal returns at the announcement of the merger of over 6%, and the returns are significant at the 1% level.

Cornett and Tehranian (1992) extend research previously conducted on returns to target banks in mergers by evaluating if the type of merger affects returns to the target. **Cornett and Tehranian** (1992) evaluate the returns to the target banks in 15 interstate and 15 intrastate bank mergers. For the entire sample, they find that target banks

experience significantly positive abnormal returns at the announcement of the merger. When they divided the sample into interstate and intrastate mergers, they find that target banks in interstate mergers receive abnormal returns of 4.70%, and target banks in intrastate bank mergers receive returns of 11%. The authors find that the difference in the returns to the two samples is significant, thus indicating that the market more positively views those mergers that expand banks geographically.

Siems (1996) in its review of large bank mergers provide contradictory evidence to the results found in **Cornett and Tehranian** (1992). **Siems** evaluates abnormal returns for the target banks in 19 large bank mergers that occur in 1995. The article evaluates mergers of banks with combined assets of greater than \$10 billion. The results are consistent with those found in previous research for target banks. Over the two-day event window, target firms experience abnormal returns of 12.81%, that are significant at the 1% level.

Siems' tests the synergy and diversification hypotheses in his analysis of the 19 mega-mergers. He hypothesizes that mergers resulting in a higher percentage of market overlap (in-market merger), should realize greater synergistic gains through cost savings. And those mergers that take the acquiring bank into new markets (out-of-market merger) should offer the combined bank the opportunity to expand its product base and geographically diversify. The author separates the mergers based upon the degree of market overlap in location and business lines and then compares the market's reaction to the merger announcement.

Siems finds that the market more positively views mergers that lead to lower input cost and increased internal efficiencies. The cumulative average abnormal returns to target banks that increase market overlap is 13.82%, versus an average return to the remainder of the sample of only 12.76%. The difference in the returns to the two samples is significant at the 1% level. His results therefore lend support to the synergy hypothesis.

Houston and Ryngaert (1994) extensively expand the research previously conducted on bank mergers by evaluating the stock price performance of a much larger sample of bank mergers. **Houston and Ryngaert** (1994) evaluate the stock price performance of target banks on 131 merger transactions that occur over the period from 1985 through 1991. The authors' sample consisted of mergers where the target and acquirer had total assets of at least \$100 million. In their analysis, **Houston and Ryngaert** use an event window begins four days prior to the first announcement of a merger, through the date of the actual merger announcement. Thus the event period varies depending upon the amount of rumor or speculation that occurs prior to the merger announcement. Using this event window, the authors find that target banks experience cumulative abnormal returns of 14.77%, that are significant at the 1% level.

Zhang (1995) uses a much longer evaluation period in its analysis of returns to target banks. **Zhang** evaluates abnormal returns for 107 transactions over a 10-year period from 1980 through 1990. The author's results show that for the sample, the merger results in wealth creation averaging \$42 million per takeover. **Zhang** finds that over a two-day event window of one-day prior to the merger announcement through the day of the merger announcement, the target banks receive abnormal returns of 5.6%, that are significant at the 1% level. **Zhang** then evaluates abnormal returns using cross-sectional econometric analysis to investigate the potential sources of wealth created by bank takeovers. The author finds that those mergers that provide efficiency gains or geographic diversification result in positive wealth creation.

Toyne and Tripp (1998) evaluate mergers that occur during the period from 1991 through 1995, which was a period of greater merger activity due to the relaxing of interstate bank regulations and the improved performance of the banking industry. The study evaluates returns to the target banks and compares the returns to those experienced in **Cornett and De** (1991a), which uses bank merger data from a period of 1982 through 1986. The authors evaluate abnormal returns for 68 target banks over a two-day event

window. The authors find that the target banks receive abnormal returns of 10.97% around the event window that are significant at the 1% level. Their findings are in line with those found in the **Cornett and De** study.

Becher (2000) provides the most extensive review of returns in bank mergers. **Becher** (2000) is significant because the analysis utilizes data from a greater number of bank mergers over a more extensive time period. **Becher** evaluates returns for 558 bank mergers over the period from 1980 through 1997. Returns over the 18-year period are significantly positive for the target bank. **Becher** finds abnormal returns to the target of +17% over the 11-day event window surrounding the merger announcements that are significant at the 1% level. **Becher** subdivides the large sample into smaller samples based upon changes that occur in the regulatory environment for banks. He finds that mergers that occur after 1990 result in significantly more positive abnormal returns than the mergers occurring prior to 1990. He concludes that mergers are viewed in the market as a source of wealth creation.

2.4.2 Return to Acquiring Firms

Over the past 20 years, there has been extensive research conducted on the consequences of mergers on stock price of the acquiring bank. In contrast to the consistently positive results found in research on target banks in merger transaction, the returns to the acquiring banks have been mixed. **Desai and Stover** (1985) published one of the earliest research papers on the subject of returns to bidding firms in bank stock mergers. **Desai and Stover** (1985) evaluate a small sample of 18 bank holding company transactions over a six-year period ending in 1982. The analysis, which addresses only returns to the acquiring bank, consists of 15 successful transactions, and three transactions that are not consummated. **Desai and Stover** (1985) find that over the 2-day event window, the return to the acquiring banks in the successful transactions, at .83%, are significant at the 10% level. The analysis also shows that returns to the entire sample of bidding firms are positive and significant at the 5% level.

In 1987, **James and Weir** (1987) extend the research conducted in **Desai and Stover** (1985). In their analysis, **James and Weir** evaluate 60 transactions that occur over the period from 1972 through 1986. The analysis evaluates only acquiring firms' returns, and finds significantly positive abnormal returns over a two- and four- day event window. The returns to the acquiring banks using the two- day event window are 1.07%, which are significant at the 1% level. Over the longer four-day event window, returns to the acquiring bank are 1.77%, and are also significant at the 1% level. Thus, their results further support those initially found in **Desai and Stover** (1985).

Neely (1987) finds results consistent to those in previous studies in his analysis of 26 merger transactions that occur from 1979 through 1985. Though the sample size is small, and uses weekly data, **Neely** (1987) is significant because it is the first paper to evaluate both acquiring and target bank returns. **Neely's** results for the acquiring bank in a merger are consistent with those found in **Desai and Stover** (1985), and **James and Weir** (1987). The firms experience significantly positive abnormal returns over various event windows.

As did **Neely** (1987), **Trifts and Scanlon** (1987) evaluate both acquiring and target bank abnormal returns, but their analysis uses daily return data. **Trifts and Scanlon** (1987) evaluate abnormal returns for 21 merger transactions that occurred over a four- year period beginning in 1982. In contrast to the results found in **Desai and Stover** (1985), **James and Weir** (1987), and **Neely** (1987), the authors find that acquiring banks experience negative returns of 1.73% on the date of the merger announcement, and that abnormal returns are significant at the 5% level.

Susha and Bendeck (1988) compare abnormal returns to acquiring banks that already hold a significant stake in the firm acquired (internal merger), to the returns experienced by acquiring banks that do not own a significant ownership stake in the target bank prior to the merger announcement (external merger). Using a sample of 41 mergers, **Susha and Bendeck** (1988) evaluate returns over the period from four days prior to the

merger announcement through the day of the merger announcement. They find that external mergers (23) result in negative abnormal returns to the acquiring bank of 1.67% that are significant at the 5% level. Internal mergers (16) experience insignificant negative abnormal returns of .66%.

Hannan and Wolken (1989) evaluate the abnormal returns of 69 acquisitions by 43 banks during the 1982 through 1987 period. Consistent with **Trifts and Scanlon** (1987), results show that acquiring banks receive significantly negative abnormal returns of 1.73% at the merger announcement. Over the two-day event window beginning one-day prior to the merger announcement through the day of the merger announcement, acquiring banks experience negative abnormal returns of 3.78% that are significant at the 1% level. **Hannan and Wolken** (1989) find similar results for the acquiring banks when evaluating longer periods of time.

Earlier research on bank merger activity appears hampered by possible biases due to small sample size. The paper by **Cornett and De** (1991a) helps to alleviate this potential bias because it evaluates a somewhat larger sample of bank mergers in its analysis of abnormal returns to the target and acquiring bank. In contrast to the results found in **Trifts and Scanlon** (1987) and **Hannan and Wolken** (1989), and in support of earlier works by **Desai and Stover** (1985) and **James and Weir** (1987), **Cornett and De** (1991a) find that targets experience positive returns at the announcement of a merger. **Cornett and De** (1991a) evaluate the returns of 59 acquiring banks participating in 150 mergers over a period from 1982 through 1986. They find that acquiring banks experience abnormal returns of .65% at merger announcement, which returns are significant at the 1% level. Though **Cornett and De** find returns to target firms that are in line with results from previous research, returns to the acquiring firms are a departure from the more recent works of **Trifts and Scanlon** (1987) and **Hannan and Wolken** (1989). Reasons for the difference in results may be attributable to the sample evaluated, or the timing of the mergers.

To evaluate the relevant factors affecting merger returns, **Cornett and Tehranian** (1992) extend research previously conducted on returns to targets and acquiring firm by evaluating if the type of merger affects abnormal returns. **Cornett and Tehranian** (1992) investigate returns to target and acquiring banks in 15 interstate and 15 intrastate bank mergers. For the entire sample, they find that acquiring banks experience significant abnormal returns of -.80%. When the sample is divided into interstate and intrastate bank mergers, they find that intrastate state bank mergers result in significantly negative abnormal returns to the acquiring firm (-1.90%), but acquiring firms in interstate bank mergers experience positive returns (.34%) that were insignificant. They conclude that the market positively perceives the merger if it expands the bank into new markets; but mergers resulting in market overlap are negatively perceived by the market.

Siems (1996) in its review of large bank mergers provides results that are contradictory to those found in **Cornett and Tehranian** (1992). **Siems** evaluates abnormal returns for acquiring banks for a sample of 19 mergers resulting in combined assets of the merged banks of greater than \$10 billion. His results are consistent with those found in **Hannan and Wolken** (1989), and **Trifts and Scanlon** (1987) for target banks. Over the two-day event window, 11 of the 19 acquiring banks experience negative abnormal returns. Average returns to the acquiring banks are -1.49%, and returns are significant at the 1% level.

Siems then test the effect of synergy and diversification on mergers and shows that the market more positively reacts to mergers leading to higher overlap in geographic location and business lines. The cumulative average abnormal return to the acquiring bank for the five mergers with the highest office overlap is 2.80%, and the return is significant at the 5% level. The cumulative average abnormal returns for the remaining 14 acquiring banks is -3.66%, and the results are also significant at the 1%. The difference in the returns for the two groups is statistically significant at the 1% level.

Thus results indicate that mergers that increase synergy, rather than mergers leading to greater geographic diversification, are more positively received by the market.

Houston and Ryngaert (1994) extensively expand the data sample evaluated in previous bank merger papers by evaluating the stock price performance of a much larger sample of bank mergers. **Houston and Ryngaert** (1994) evaluate the stock price performance of 153 bidding banks in 131 merger transactions that occur over the period from 1985 through 1991. The authors' sample consists of mergers where the target and acquirer have at least \$100 million each in total assets. In their analysis, **Houston and Ryngaert** use an event window of four days prior to the first announcement of a merger through the date of the actual merger announcement. Thus the event period varies depending upon the amount of rumor or speculation that occurs prior to the merger announcement. Using this event window, the authors find that returns to the target are consistent with previous research conducted by **Neely** (1987), and **Cornett and Tehranian** (1992). They find that acquiring banks experience significantly negative cumulative abnormal returns of 2.52% over the event window. These results are in line with those found in **Hannan and Wolken** (1989), and **Trifts and Scanlon** (1987) and are in contrast to those found in **Cornett and De** (1991a).

Zhang (1995) evaluates abnormal returns for 107 transactions over a 10-year period from 1980 through 1990. The author's results show that for the sample evaluated, the merger results in wealth creation averaging \$42 million per takeover for the combined target and acquiring firm. The return is statistically significant and economically non-trivial. But the author finds that over the two-day event the acquiring bank experiences insignificant returns of .54%.

Toyne and Tripp (1998) evaluate mergers that occur during the period from 1991 through 1995, which was during a period of greater merger activity due to the relaxing of interstate bank regulations and an improvement in the operating performance of the banking industry. The study evaluates abnormal returns to the acquiring bank and

compares results to those experienced in the earlier paper by **Cornett and De** (1991a). Since **Cornett and De** evaluate abnormal returns during the period from 1982 through 1986, and **Toyne and Tripp** evaluate mergers during a later period, the authors attempt to explain inconsistency of results in previous paper on bank mergers. The authors evaluate abnormal returns for 68 acquiring bank over a two-day event window, and find results that differ from those in **Cornett and De**; their results are in line with those of **Hannan and Wolken** (1989) and **Trifts and Scanlon** (1987). **Toyne and Tripp** find that the acquiring banks experience negative abnormal returns of 2.24%, which are significant at the 1% level. The authors attribute the differences in results to the method of payment used in the two samples (**Toyne and Tripp**'s sample is almost exclusively stock transactions), and to an increase in offer premiums in later transaction to reduce the likelihood of competition in the acquisition.

Becher (2000) provides the most extensive review of returns in bank mergers to date. **Becher (2000)** is significant because the analysis utilizes data from a greater number of bank mergers over a more extensive time period. **Becher** evaluates returns for 558 bank mergers over the period from 1980 through 1997. Returns to the acquiring banks over the 18-year period are -1.08% , and are significant at the 1% level. **Becher** subdivides the 18-year time period into sub-periods based upon changes in bank merger regulations. He then re-evaluates returns to the acquiring banks over the different sub-periods and finds that mergers that occur after 1990 result in significantly more positive abnormal returns than those occurring prior to 1990. He attributes the difference in returns to acquiring firms pre- versus post- 1990 to the changes in the regulatory climate on mergers.

2.4.3 Combined Returns

Hannan and Wolken (1989) authored one of the first papers to evaluate returns to the combined firm in bank acquisitions. The authors evaluate abnormal returns of 69 targets and 43 acquiring banks that participate in mergers during the 1982 through 1987

period. Over the two-day event window, the target bank receives positive abnormal returns, the acquiring bank receives negative abnormal returns, both of which are significant at the 1% level. The return for the combined target and acquiring bank is -.99%, and is not significant. The result supports the theory of wealth transfer rather than wealth creation as the result of mergers.

Cornett and Tehranian (1992) extend the research previously conducted by **Hannan and Wolken** (1989) on returns to target and acquiring banks by investigating whether the type of acquisition affects abnormal returns the combined firm. **Cornett and Tehranian** (1992) evaluate the returns to targets and acquirers in 15 interstate and 15 intrastate bank mergers. For the entire sample, they find that the return to the combined firm at the merger announcement is 2.09%, and the return is significant at the 5% level. **Cornett and Tehranian** also compared the returns by merger type, and find that intrastate state bank mergers result in significantly negative abnormal returns to the acquiring bank, but banks participating in interstate bank mergers experience no abnormal returns. Targets in interstate and intrastate bank mergers receive significantly positive abnormal returns. Thus, the research indicates that the market positively perceives the merger if it expands the bank into new markets; but the market negatively perceives mergers that result in market overlap.

Houston and Ryngaert (1994) evaluate the stock price performance of 153 bidding firms in 131 transactions that occur during the period from 1985 through 1991. The authors' sample consists of mergers where the target and acquiring banks each have at least \$100 million in assets. The authors find that returns to the target and acquirer are consistent with previous research conducted by **Neely** (1987), and **Cornett and Tehranian** (1992), and combined returns are consistent with those found in **Hannan and Wolken** (1989). They find that acquiring banks experience significantly negative cumulative abnormal returns, that targets banks experience significantly positive

cumulative abnormal returns, and that the combined returns for the targets and acquiring banks are not significant.

Zhang (1995) evaluates abnormal returns for 107 transactions over a 10-year period from 1980 through 1990. The author's results show that for the sample evaluated, the merger resulted in wealth creation averaging \$42 million per takeover. The author finds that over a two-day event window, the combined target and acquiring bank shareholders receive cumulative abnormal returns of 6.13%, that are significant at the 1% level. Using cross-sectional econometric analysis, **Zhang** investigates the potential sources of wealth created by the bank takeovers. He concludes that mergers that provide efficiency gains or geographic diversification resulted in positive wealth creation.

Toyne and Tripp (1998) evaluate mergers that occur during the period from 1991 through 1995, which is a period of greater merger activity due to the relaxing of interstate bank regulations and the improvement in the operating and financial performance of banks. The study evaluates abnormal returns to the target and acquiring bank and compares results to those found in the **Cornett and De (1991a)** analysis, which uses bank merger data from the 1982 through 1986 period. Using a two-day event window for the 68 bank mergers, **Toyne and Tripp** calculate combined returns for the transaction. The authors find that target banks receive abnormal returns that are positive and significant, that the acquiring bank receives negative abnormal returns that are significant, and the target and acquiring bank combined receive cumulative, negative abnormal returns of .70%, which are significant at the 1% level.

Becher (2000) provides the most extensive review of returns in bank mergers. **Becher** evaluates returns for 558 bank mergers over the period from 1980 through 1997. Returns over the 18-year period for the combined firm are significantly positive. **Becher** finds abnormal returns to the combined firm of 1.80%, which are positive and significant at the 1% level. **Becher** then subdivides the sample into sub-samples to reflect differences in the regulatory environment during the time of the merger. He finds that mergers that

occur after 1990 result in significantly more positive abnormal returns than mergers that occur prior to 1990. He attributes the difference in returns to the relaxation of merger laws in the banking industry.

2.4.4 Long-term Returns to Shareholders

Neely (1987) investigates the long term stock price effects of bank merger announcements by examining abnormal returns to 26 bank mergers that occur between 1979 and 1985. Using weekly stock data, **Neely** analyzes acquiring bank and target returns over a 40-week period from 10 weeks prior to merger announcement through 30 weeks post merger announcement. **Neely** finds no abnormal returns over the entire forty-week period for the acquiring firm, but did find significant positive abnormal returns to the acquiring bank during the first two weeks after the merger announcement. The target experiences no significant abnormal returns over the entire 40 week period being investigated, but did experience abnormal returns which were significant at the 1% level for the period from ten weeks prior to the merger announcement through 10 weeks post-merger announcement. Thus the results appear to indicate that there is some run up in the value of the target's stock due to information leakage prior to the announcement of the merger, but the acquiring bank experiences no appreciable benefit prior to merger announcement. Post- merger announcement, the target continues to experience abnormal positive returns for up to ten weeks, where as acquiring bank returns are only significant in the first two weeks after the announcement of the merger.

Madura and Wiant (1994) extend the research conducted by **Neely** on the long-term stock effect of bank mergers by evaluating a much larger sample of acquisitions over an longer time period. **Madura and Wiant** evaluate 152 acquiring banks over a five-year period from 1982 through 1987. Using monthly data collected from 62 months prior to the merger announcement through three years after the merger announcement, the authors find that acquiring banks experience significant negative abnormal returns over the three-year period after the merger announcement. **Madura and Wiant** divide the

sample between small and large banks to determine if returns are influenced by bank size, and find that both small and large acquiring banks experience significant negative abnormal returns over the three year period after the announcement.

Madura and Wiant evaluate the systematic risk of the banks, to determine if negative abnormal return can be attributed to a shift in the beta, or risk parameter of the banks. They determine that there is no appreciable difference in the risk parameters of the banks pre- versus post- merger.

Madura and Wiant then analyze cross sectional data on the firms to determine if certain characteristics were influential in determining the long-term share price response to acquisitions. Using regression analysis, the authors collect data on the relative size of the target to the acquiring bank, the size, growth rate, and capitalization rate of the acquiring bank, the medium of payment used in the merger, whether the acquisition was an interstate bank merger, and whether the acquiring bank had participated in multiple transactions. **Madura and Wiant** find that the growth rate of the acquiring bank over the period prior to the acquisition is negatively correlated to stock price performance post acquisition, thus indicating an inverse relationship between the growth rate of acquiring banks and their performance. They also find that there is a significant negative correlation between long term stock price and whether the acquisition is an interstate bank merger. The results indicate that the stock price of acquiring banks in intrastate mergers performs better than that for acquiring banks in interstate mergers over the post-merger period. And finally, they find a significant negative relationship between the recent performance of the acquiring bank and stock price post- merger, indicating that post acquisition performance is higher for banks that experience relatively poor performance prior to the acquisition.

2.4.5 Medium of Exchange

Cornett and De (1991b) compares the abnormal stock returns in bank mergers for stock, cash and combination stock/cash mergers. The authors evaluate abnormal

returns for 132 acquiring and 36 target firms involved in interstate mergers over a four-year period from 1982 through 1986. For the sample, **Cornett and De** finds that the target banks receive abnormal returns of 7.69% at the merger announcement, which returns are significant at the 1% level. They also find that the acquiring bank receives significant positive abnormal returns of .89% on the merger announcement day. A cross sectional analysis of mergers based upon the medium of exchange shows that all acquisition types experience significant positive returns in interstate bank mergers.

Cornett and De then compare abnormal returns based upon the financing method utilized, to determine if returns to the bidding/target bank are affected by the method of payment. The authors find no significant differences in announcement period abnormal returns for the acquiring banks, but do find differences in abnormal returns to the target banks dependent upon the medium of exchange. **Cornett and De** find an insignificant improvement in returns in all cash or all stock transactions, than for combination stock/cash transactions.

Cornett and Tehranian (1992) evaluate pre- and post- merger performance of 15 interstate and 15 intrastate bank mergers that occurred during 1982 through 1987. The authors use ratio analysis to determine if changes in capital structure, due to method of payment used in the transaction, affect the performance of the merged bank. The authors compare the performance of the merged banks pre- and post- merger to an index of NYSE and AMEX listed banks. The authors compute pretax operating return, average annual cash flows, return on assets, return on equity, loans to equity, capital to assets, and deposits to equity. They then benchmark the performance of the merged bank to the industry index to determine if the banks experience any significant post- merger improvement based upon method of acquisition.

Cornett and Tehranian find that the banks that merge experience significant improvement in cash flows, return on equity, loan to equity, and deposit to equity post merger, thus indicating that the banks are better able to attract more loans and deposits.

When the authors test for differences in performance based upon method of payment, they find no significant differences in performance post- merger. Thus the improvement in performance post- merger is not attributable to the method of payment used in the merger.

Houston and Ryngaert (1994) also address the medium of exchange used in bank mergers to explain abnormal returns. The authors evaluate the use of preferred stock and conditional common stock as mediums of payment and the affect of its use on abnormal returns. The authors collect stock price data on 131 consummated transactions over a period of four days prior to the first announcement of the merger, through the date of the actual merger announcement. They segment the transactions based upon whether they are cash or stock transactions. Of the 131 consummated transactions, 80% are financed using some form of stock. The authors further segment the stock transactions into preferred stock, common stock with a conditional exchange rate based upon the acquiring firm's future stock price, and common stock with a fixed exchange rate. The authors then complete a cross sectional analysis of abnormal returns to test for differences in medium of payment.

Houston and Ryngaert find that acquiring firms receive significantly negative returns at the announcement of the merger, and the target receives significantly positive abnormal returns. The combined returns are insignificant. The authors also find that the financing mechanism significantly affects abnormal returns at merger announcement. Using regression analysis, the authors test whether the method of payment affects abnormal returns to the target bank, to the acquiring bank, and to the target and acquiring bank on a combined basis. Using dummy variables to account for the financing method utilized, the authors find that the use of stock is negatively correlated to abnormal returns for the bidding and target firms combined, and the affect is significant at the 5% level. The authors find that the use of stock results in abnormal returns that are 2.18% less than returns received in cash transactions. They also find that the use of conditional stock and

preferred stock are positively correlated to abnormal returns. The use of conditional stock results in a 1.89% increase in abnormal returns; using preferred stock results in a 3.96% increase in abnormal returns. Both of these results are significant at the 5% level. Thus they find that overall, negative abnormal returns are associated with the use of stock, although the use of conditional or preferred stock results in more positive returns than using common stock with a fixed exchange ratio.

In contrast to the results found in **Houston and Ryngaert (1994)**, **Zhang (1995)** also evaluates the medium of exchange and its effect on abnormal returns in bank mergers, but finds that the method of payment has little explanatory effect in predicting abnormal returns at merger announcement.

In **Allen and Cebenoyan (1991)**, the authors investigate the type of financing vehicle chosen by management, given the level of managerial ownership of the firm and the shareholder concentration of the firm. Using data from 58 bank holding companies involved in 546 acquisitions over a seven-year period from 1979 through 1986, the authors find that when managers have a high managerial stake in the company, they are more likely to use cash to finance merger activity. They also find that when the firm has a manager with low managerial stake in the company, and the firm has high shareholder concentration, the manager will more likely choose stock to finance the acquisition.

2.4.6 Determinants of Merger Premiums

Adkisson and Fraser (1990) evaluate 174 interstate and intrastate mergers of bank holding companies during the period from 1985 through 1986 to determine the effect of alternative acquiring and targets banks to the premium paid in an acquisition. They use regression analysis to model the relationship between merger premiums, defined as the ratio of price to book value of the target, the number of alternate targets, the target bank's capital ratio and return on assets, the medium of exchange, and whether the transaction involves an interstate or intrastate merger. **Adkisson and Fraser** determine that the number of alternative targets negatively affects acquisitions premiums, and these

results are significant at the 1% level. They also find that the target bank's return on asset and capital ratios are positively correlated to merger premiums.

By separating acquisitions based upon whether the state where the target is located allows interstate or intrastate banking, **Adkisson and Fraser** investigate the affect of regulatory climate on returns in a bank merger. Of the 174 transactions evaluated, 83 transactions are in states that permit both interstate and intrastate banking, 40 transactions are in states that permit only interstate banking, 28 transactions are in states that permit only intrastate banking, and 23 transactions are in states that permit neither interstate or intrastate banking. They find that merger premiums are positively related to the allowance if both interstate and intrastate. They find no relationship between merger premiums and the method of payment in the transaction.

Shawky, Kilb and Staas (1996) extend the review of the determinants of merger premiums in bank acquisitions by reviewing 320 banks acquisitions over a 9-year period from the beginning of 1982 through October 1990. The study examines the relationship between merger premiums, defined as the ratio of purchase price to book value of the target bank, and the financial characteristics of the target bank. The study shows that the merger premium is higher for stock transactions than cash transactions, and that both return on assets and return on equity are positively and significantly correlated to the merger premium. They also find a negative relationship between merger premium and the asset size of the target bank, indicating that smaller banks are more competitively price. In support of **Adkisson and Fraser** (1990), **Shawky, Kilb and Staas** also find a positive relationship between interstate transactions and merger premiums. **Shawky, Kilb, and Staas** find that other things being equal, the premium paid for interstate acquisitions are higher than those paid for intrastate acquisitions.

2.4.7 Post Merger Operating Performance

There have been several studies conducted that address how firms perform post merger. **Rose** (1987) is one of the first papers to evaluate the post- merger operating

performance of banks. **Rose** hypothesizes that banks that become acquirers do so to obtain financial synergies such as through an increase in debt capacity, through the lowering of risk, or through operating and/or product synergies. He indicates that those firms that become acquirers should be less profitable prior to merger, as compared to the industry, and their performance should improve post- merger. **Rose** collects data on 40 acquiring banks and 546 acquired banks over a five-year period pre- and post- merger and matches each bank to a similar bank not in the acquisition market. He compares the performance of the acquiring and non-acquiring banks over the five-year period prior to the acquisition, and finds the two bank groups perform similarly except in the areas of market efficiency and risk exposure. The ratios of assets to employees and revenues to employees are significantly lower for acquiring banks over the five-year period prior to the merger, compared to the ratios for the banks that did not make an acquisition. His results support the notion that acquiring banks are attempting to increase their operating efficiency through the merger.

The author also finds that banks in the acquisition market had a smaller proportion of their liabilities in interest sensitive CDs and money market borrowings relative to their total funding sources. This financing mix may indicate a greater reliance on local-market deposits and smaller deposit accounts. Thus the acquiring firms may also merge to enter into new deposit markets or more rapidly expand into growing market areas.

Rose also compares the performance of the target banks to a match sample of firms not acquired, and finds that prior to acquisition activity, the two bank types perform similarly, except as it relates to profitability. The return on assets and return on equity are significantly lower for the target banks as compared to return figures for those banks not acquired. Results also indicate that target banks are more conservatively managed, and the asset mix for target banks includes more government securities. The acquired banks also have substantial under utilized credit generating capacity and a greater emphasis on retail deposits, thus indicating a lower cost funding mix.

Rose also evaluates the performance of the two bank groups post- merger, and finds no performance level differences relative to non-merging banks. But, **Rose** does find that the performance of the acquiring banks improves significantly pre- versus post-merger. **Rose** finds that the combined banks more fully used their lending capacity through an increase in loans to total assets, and improve their employee productivity through an increase in the ratios of assets to employees and revenues to employees. But **Rose** also finds several declines in the post merger performance of the acquiring banks. For example, he finds that operating efficiency, as measured by operating revenues to operating expense, declines throughout the five-year period post merger, net loan losses increase, the firms increases their reliance on interest sensitive funding sources, and the average price for loan and demand deposits services increases. All of these performance declines occur with no improvement in cash flows. The firm's loan loss ratio also rises without any significant improvement in average return on assets or return on stockholders equity.

Srinivasan (1992) research on bank efficiency concentrates on a measure of the firm's ability to manage its non-interest expense. **Srinivasan** evaluates data on the ratio of non-interest expense to operating income, for merging and non-merging firms over the pre- and post- merger period. Results suggest that though banks that participate in merger activity experience a slight improvement in efficiency in years +2 through +4, the improvement is not significant. When compared to the performance of non-merging banks, results indicate that prior to the merger, both groups perform similarly except as it relates to other expenses, which are significantly lower for the merging banks. Research indicates that post merger, the combined firm performs commensurate with the industry. The author also shows that intrastate mergers are not successful in improving the combined firm's operating efficiency.

Cornett and Tehranian (1992) compare the pre- and post- merger performance of 15 interstate bank mergers and 15 intrastate bank mergers, to the performance of non-

merging banks listed on the NYSE and AMEX. Results indicate that the merging banks show improvement in operating performance post merger. Prior to the merger, banks have adjusted cash flows of .2% below the industry, which are significant at the 1% level. Post merger, the merged banks experience significant improvement in cash flows. Cash flows for the merged firms are 1% higher than adjusted cash flows for the industry, and this difference is significant at the 1% level. Both banks participating in interstate and intrastate mergers experience an improvement in cash flows post- merger. Though still below the industry average, merging banks also improve their lending capacity. The improvement in operating performance post merger occurs without a decline in loan quality.

Later research conducted by **Piloff** (1996) finds no improvement in operating performance of banks post- merger. **Piloff** evaluates the performance of 48 banks that participated in mergers over the period from 1982 through 1991. **Piloff** collects data on the individual banks over the two years prior to the merger. He consolidates this data and compares it to the post- merger performance of the consolidated bank. **Piloff** evaluates selected profitability, efficiency, and balance sheet performance measures and concludes mergers do not affect or improve the profitability of the firm.

2.4.8 Return in Large Bank Mergers

Cornett and Tehranian (1992) address a special sub-sample of merger transactions. They evaluate 30 bank mergers where the assets of the target and acquiring bank are greater than \$100 million. The mergers occur over the five-year period from 1982 through 1987. Over the two-day period that includes the day before and the day of the merger announcement, **Cornett and Tehranian** find that the target banks experience positive returns of 8% that are significant at the 1% percent level. Acquiring banks returns, at -.80%, are significantly negative over the same two-day period. On a combined basis, abnormal returns to the entire sample are 2.09%, and are significant at the 5% level.

Houston and Ryngaert (1994) extend the research conducted by **Cornett and Tehranian** to evaluate 131 merger transactions occurring during a period from 1985 through 1991. Using a period of 4 days prior to the date the merger was leaked, through the date of the merger agreement, **Houston and Ryngaert** find that acquiring firms experience significant negative returns, that target banks experience significant positive returns, and that the combined returns for the sample are insignificant. Over the evaluation period, the acquiring banks experience abnormal returns of -2.25% , which are significant at the 1% level. In contrast, over the same period, the target firms experience abnormal returns of 14.77% , which are also significant at the 1% level. On a combined basis, the target and acquiring firms receive an abnormal return of $.46\%$ that is not significant.

Siems (1996) also evaluates returns in large bank mergers by looking at a sample of 19 mega-mergers that occur in 1995. The mergers included in the sample result in a combined firm with total assets of at least \$10 billion. Evaluating returns over a two-day period beginning one day prior to the merger announcement, **Siems** finds that the acquiring firms experience an abnormal return of -1.49% , and target firms shareholders receive an abnormal return of 12.81% , both of which are significant at the 1% level. Using varying event windows, he finds similar results for abnormal returns to target and acquiring banks.

2.4.9 Relative Size Effects in Mergers

Houston and Ryngaert's (1994) analysis evaluates the effect of relative size between the target bank and the acquiring bank and its effect on abnormal returns. The authors complete a cross sectional analysis to determine the effects of differences in size between the target and the acquiring bank on abnormal returns. To evaluate the size effect, the authors calculate a market ratio for the target and acquiring bank. The ratio is computed as the market value of the target bank five-days prior to the first announcement of a merger, divided by the market value of the target plus the acquiring bank over the

same time period. Results show that acquiring bank's returns are negatively related to the size of the target, and target returns are negatively related to the size of the transaction. They find no correlation between the relative size of the target and acquiring bank, and the combined abnormal returns. This appears reasonable since as the size of the deal increases, greater weight is placed upon the positive target bank's return, and less weight is placed on the negative acquiring bank's return. They also conclude that acquiring banks overpay for targets, and thus suffer much larger share price declines on larger deals.

Zhang (1995) also evaluates the affect of relative size of the target to the acquirer and its effect on abnormal returns in a merger announcement. The author evaluates 107 transactions over a 10-year period from 1980 through 1990. The author hypothesizes that banks engage in takeover activities to realize efficiency gains and to diversify their portfolio of assets. **Hawawini and Swary (1990)** show that a relative size measure can be used to measure potential gains in efficiency. **Hawawini and Swary** suggest that the smaller the target firm relative to the acquiring firm, the greater the potential gains in efficiency.

To evaluate efficiency gains from takeover activity, **Zhang** uses a somewhat different market approach than the measurement used in **Houston and Ryngaert (1994)**. Using share price data ten days prior to the event announcement, **Zhang** computes an efficiency ratio, defined as the market value of the acquiring bank divided by the market value of the target bank. The author finds a positive and significant relationship between abnormal returns and this efficiency ratio, thus suggesting that efficiency gains may be the reason for the takeover activity.

To determine whether the source of the wealth gain is due to diversification, **Zhang** includes a dummy variable in the regressions analysis for whether the merger is interstate. Since efficiency gains normally occur in smaller mergers, **Zhang** also includes a variable to measure whether the gains from geographic diversification occur in relatively larger takeovers. Using the two-day event window for abnormal returns,

Zhang confirms that wealth gains in mergers are positively correlated with efficiency and diversification. Abnormal returns are significantly positively relative to the efficiency ratio. Thus the greater the difference between the size of the acquiring bank and the target bank, the more positive the abnormal return. The author also finds that wealth gains are positively and significantly correlated to the transaction being interstate, or diversifying transaction. But the author finds the relative size of the takeover does not influence the gain from geographic diversification.

2.4.10 Summary

Target stockholders of banks experience positive significant abnormal returns at merger announcement, which results are consistent to those found for corporate firms. Research indicates that acquiring firms in mergers experience significantly negative abnormal returns around the event window. **Becher** (2002) found significantly positive abnormal returns for the combined sample over the announcement period. These results are in contrast to previous research on the returns to the stock of the merged bank, and are due to changes in the regulatory climate for later mergers.

Previous research shows that abnormal returns to the target and acquiring bank are affected by the medium of exchange used in the merger, and by the relative size of the target bank to the acquiring bank. And there was only limited indication of improved operating performance by the bank post- merger.

CHAPTER 3

TESTABLE HYPOTHESIS

In this chapter I will present the hypotheses to empirically test the wealth effects of mergers on the tradable securities of merging banks. The hypotheses are based upon theoretical research on the motives for mergers and on the effects of mergers on the common stock, preferred stock and bonds of the merging firms.

In my analysis I will test for any wealth effects of mergers on the tradable securities of the banking institutions in my sample by comparing actual values for the securities post- merger to a predicted value for the security. I will also test for any redistribution effects associated with mergers by testing the combined value of all of the security classes of the merging firms. To fully support the synergy theory, mergers must result in net synergistic gains for the combined claimants of the firm. Thus stockholders, as the residual claimants, should receive positive abnormal returns as a result of the merger, and preferred stock and bondholders should experience non-negative abnormal returns. Provided below are the specific hypotheses to be tested for each security class, for target banks, acquiring banks, and for the combined firms.

3.1 Common Stock Security Market Assessment

There has been extensive theoretical and empirical research which supports the existence of a positive relationship between mergers that increase synergy and abnormal returns. The hypothesis to be tested in my empirical study of the wealth effects of mergers on the common shares of the target bank is as follows:

$$H_0: \text{Common Stock Valuation Prediction Error}_{\text{Tar}} \leq 0$$

$$H_1: \text{Common Stock Valuation Prediction Error}_{\text{Tar}} > 0$$

A rejection of the null hypothesis is consistent with both the synergy and hubris theory that predicts positive abnormal returns to target banks at the merger announcement. Returns to the target bank that are zero or negative do not support the synergy or hubris theory for mergers; rather these results lend support to the agency theory. Thus, a failure to reject the null hypothesis indicates that managers seek mergers to improve their position in the firm at the expense of the residual claimants (empire building).

The hypothesis for the empirical test of wealth related changes to acquiring banks, is also based upon the synergy theory and is as follows:

$$H_0: \text{Common Stock Valuation Prediction Error}_{\text{Acq}} < 0$$

$$H_1: \text{Common Stock Valuation Prediction Error}_{\text{Acq}} \geq 0$$

A rejection of the null hypothesis is consistent with the synergy theory that predicts non-negative abnormal returns to the acquiring firms in mergers. A failure to reject the null hypothesis, due to negative abnormal returns to the acquiring bank, provide support for the agency or hubris theory for mergers.

The hypothesis to test for wealth related changes to the common shares of the combined firm is:

$$H_0: \text{Common Stock Valuation Prediction Error}_{\text{Comb}} \leq 0$$

$$H_1: \text{Common Stock Valuation Prediction Error}_{\text{Comb}} > 0$$

Rejection of the null hypothesis supports the synergy theory for mergers, which indicates that abnormal returns to the target firm are positive, abnormal returns to the

acquiring firm are non-negative, and the abnormal return to the combined firm is positive.

A failure to reject the null hypothesis supports the agency or hubris theory that mergers increase wealth to the shareholders of the target firm at the expense of the acquiring firm's shareholders, with the overall return to the shareholders of the combined firm being non-positive.

3.2 Preferred Stock Security Market Assessment

Positive abnormal returns to the shareholders of preferred stock in a stock merger are consistent with the synergy theory for mergers. Preferred stockholders, as the junior claimants of the company, benefit from mergers that increase cash flows and reduce risk. In contrast, mergers that increase the credit risk of the firm negatively impact the market value of preferred stock by increasing the securities' volatility. The hypothesis to test abnormal returns to preferred stockholders is:

$$H_0: \text{Preferred Stock Valuation Prediction Error}_{\text{Comb}} < 0$$

$$H_1: \text{Preferred Stock Valuation Prediction Error}_{\text{Comb}} \geq 0$$

Rejection of the null hypothesis supports the synergy theory for mergers. A failure to reject the null hypothesis indicates that bank mergers do not enhance value for the junior claimants of merging banks. Rather, the results support the agency and hubris theory of mergers, and indicate that mergers are value reducing for the preferred stockholders.

3.3 Bond Security Market Assessment

While not as extensive as the research conducted on abnormal returns to the common stockholders in mergers, there has been some research conducted on the effect of mergers on bond premiums of the merging firm. Theories on bondholder returns in

mergers indicate that mergers can increase bond prices by increasing cash flows and reducing credit risk (coinsurance of debt theory). Mergers that increase the riskiness of the merging firm reduce bond prices and expropriate wealth from the bondholders to the shareholders. The testable hypothesis for bondholder returns is:

$$H_0: \text{Bond Valuation Prediction Error}_{\text{Comb}} < 0$$

$$H_1: \text{Bond Valuation Prediction Error}_{\text{Comb}} \geq 0$$

Rejection of the null hypothesis supports the synergy theory for mergers as it relates to bonds, and indicates that the mergers do not increase the default risk of the bank. An inability to reject the null hypothesis indicates that mergers increase the firm's default risk, and support the agency and hubris theory for mergers.

3.4 Net Synergistic Gains and Wealth Redistribution Assessment

To test for net synergistic gains as a result of the merger I must evaluate abnormal returns to the security classes combined. The hypothesis being used to test for net synergistic gains due to the merger is:

$$H_0: \text{Merged Bank Valuation Prediction Error} \leq 0$$

$$H_1: \text{Merged Bank Valuation Prediction Error} > 0$$

A rejection of the null hypothesis supports the net synergistic gain theory and indicates that mergers result in positive abnormal returns to the tradable securities of the firm. A failure to reject the null hypothesis supports the agency and hubris theories, and indicates that mergers do not result in net synergistic gains. Rather, managers make merger decisions to enhance their position, or due to managerial error.

The wealth redistribution theory indicates that there is an expropriation of wealth between security claimants, and that expropriation may or may not affect abnormal

returns to the combined firm. If mergers result in wealth transfer between stockholders and other claimants, you will expect to see a negative relationship between the returns of the different security classes. The hypothesis being used to test the theory of wealth redistribution between security classes is a failure to reject the null hypothesis for net synergistic gains provided above, and a failure to reject either of the following hypotheses:

$$H_0: \begin{aligned} &\text{Common Stock Valuation Prediction Error}_{\text{Comb}} \geq 0 \\ &\text{Bond Abnormal Valuation Prediction Error}_{\text{Comb}} + \text{Preferred Stock} \\ &\text{Valuation Prediction Error}_{\text{Comb}} < 0 \end{aligned}$$

$$H_1: \begin{aligned} &\text{Common Stock Valuation Prediction Error}_{\text{Comb}} > 0 \\ &\text{Bond Valuation Prediction Error}_{\text{Comb}} + \text{Preferred Stock} \\ &\text{Valuation Prediction Error}_{\text{Comb}} = 0 \end{aligned}$$

Or

$$H_0: \begin{aligned} &\text{Common Stock Valuation Prediction Error}_{\text{Comb}} < 0 \\ &\text{Bond Valuation Prediction Error}_{\text{Comb}} + \text{Preferred Stock} \\ &\text{Valuation Prediction Error}_{\text{Comb}} \geq 0 \end{aligned}$$

$$H_1: \begin{aligned} &\text{Common Stock Valuation Prediction Error}_{\text{Comb}} > 0 \\ &\text{Bond Valuation Prediction Error}_{\text{Comb}} + \text{Preferred Stock} \\ &\text{Valuation Prediction Error}_{\text{Comb}} = 0 \end{aligned}$$

A rejection of the null hypothesis in either of the above equations, in conjunction with a rejection of the null hypothesis in equation 3.6, supports the synergy theory for mergers and indicates that mergers are winning propositions for all of the claimants of the firm. A failure to reject the null hypothesis supports the agency and hubris theory for

mergers, and indicates that mergers do not generate wealth, but rather expropriate wealth from one security class to another.

CHAPTER 4

METHODOLOGY

This chapter provides the methodology to be used in the empirical tests of the hypotheses presented in Chapter 3 and is based upon the methodology used in Maquieira, Megginson, and Nail (1998) and Nail (1996). The objective of my study is to examine the wealth effects of mergers on the publicly traded securities of the merging firm. The methodology that I employ to measure merger related wealth changes varies from the standard event study methodology in its handling of the event window. Standard event study methodology computes abnormal returns using a specified event window surrounding the merger announcement. In my analysis, the event window covers a period from two months prior to the merger announcement, through two months after the consummation of the merger transaction. Since the length of the event window varies depending upon the merger transaction, the standard event study methodology is inappropriate for my analysis.

The methodology employed for determining merger-related changes in value is to derive a post-merger expected value for each security in the sample and to compare the expected value to the actual value for each security post-merger. By adjusting pre-merger security values, using an appropriate benchmark to account for changes in value due to macroeconomic factors, I derive a post-merger expected value for each security. The expected values is adjusted to incorporate changes in value due to cash distributions to security holders (i.e. dividends) and due to changes in the number/level of securities

outstanding (i.e. repurchases, conversions, calls, and sinking-fund payments). I derive a valuation prediction error (VPE) for each security in the sample, which measures the difference in the actual value and the predicted value of each security. The specific methodology that I will employ to evaluate each security class is further described below.

4.1 Common Stock VPE

To analyze merger-related changes to the security classes of the merging firms, I compare the expected value of the security at the end of the event window to its actual value. An impediment to using this method to evaluate merger related changes in common stock is the absence of the common stock of the target bank post- merger, or in some cases, the absence of the stock of both the target and acquiring banks post- merger. In the former case, only the stock of the acquiring bank continues to trade after the merger is consummated. The shareholders of the target bank receive shares of the acquiring bank as compensation for their target common shares. In the latter case, neither the shares of the target nor the acquiring bank continue to trade. Rather, new common stock is issued as compensation to the target and the acquiring bank shareholders.

Since the shares of the target firm, and in some cases the acquiring firm, cease to exist post- merger, the shares of the surviving firm are allocated to the target and acquiring bank on a pro-rata basis using the conversion ratio specified in the acquisition agreement. So, even though the shares of one or more of the participating firms no longer trade post- merger, I am still able to compute a post merger expected value and actual market value for the target and acquiring bank.

To allocate shares of the merged firm to the target firm's shareholders, I multiply the conversion ratio specified in the acquisition agreement by the total number of

common shares outstanding by the target bank as of the merger effective date. Thus the total shares owned by the shareholders of the target bank post- merger are:

$$TarShares_{+2} = TarShares_0 * ConvRatio$$

Where:

$TarShares_{+2}$ = number of shares allocated to the target shareholders post- merger.

$TarShares_0$ = number of target bank shares outstanding as of the delist date.

$ConvRatio$ = the ratio of acquiring bank shares received for each share of stock of the target bank.

The number of shares allocated to the acquiring bank post- merger ($AcqShares_{+2}$) is the difference between the total shares outstanding at the end of the event window ($CombShares_{+2}$) and the shares allocated to the shareholders of the target bank ($TarShares_{+2}$).

The expected price of the stock post merger is computed as:

$$Tar CSEP_{+2} = Tar CSMP_{-2} * \frac{S \& P Bank Index_{+2}}{S \& P Bank Index_{-2}}$$

$$Acq CSEP_{+2} = Acq CSMP_{-2} * \frac{S \& P Bank Index_{+2}}{S \& P Bank Index_{-2}}$$

Where:

$TarCSEP_{+2}$ = expected price of the common stock of the target bank at the end of the event window.

$AcqCSEP_{+2}$ = expected price of the common stock of the acquiring bank at the end of the event window.

$TarCSMP_{-2}$ = the share price of the target bank at the beginning of the event window.

$AcqCSMP_{-2}$ = the share price of the acquiring bank at the beginning of the event window.

S&P Bank Index = Standard and Poor's Bank Composite Index. The index is comprised of 30 major regional and money center banks.

The expected value of the target (acquiring) bank is computed by multiplying the post merger expected stock price by the shares allocated to the target (acquiring) bank shareholders:

$$TarCSEMV_{+2} = TarCSEP_{+2} * TarShares_{+2}$$

$$AcqCSEMV_{+2} = AcqCSEP_{+2} * AcqShares_{+2}$$

Where:

$TarCSEMV_{+2}$ = expected market value of the common stock of the target bank at the end of the event window.

$AcqCSEMV_{+2}$ = expected market value of the common stock of the acquiring bank at the end of the event window.

The expected market value of the common stock of the surviving firm ($CombCSEMV_{+2}$) is the sum of the individual target and acquiring bank expected values.

To calculate abnormal returns, the expected value of the common stock must be compared to the actual market value. The actual market value of the bank post- merger is computed as the share price of the merged bank at the end of the event window multiplied by the number of shares outstanding. Thus the actual market price is:

$$CombCSAMV_{+2} = CS Price_{+2} * CombShares_{+2}$$

Where:

$CombCSAMV_{+2}$ = actual market value of the common stock at the end of the event

window.

$CSPrice_{+2}$ = market price per share of common stock at the end of the event window.

Once the post- merger actual market value of the merged firm is calculated, the value must again be apportioned between the target and acquiring bank. The shares are allotted in the same manner used to compute the expected values for the target and acquiring bank based upon the conversion ratio provided in the acquisition agreement. The actual market value of the common stock for the target ($TarCSAMV_{+2}$) and acquiring bank ($AcqCSAMV_{+2}$) are computed by multiplying the number of common shares allocated by the share price of the merged firm at the end of the event window.

Valuation Prediction Errors are computed for each security as a ratio of the actual market value of the common stock, inclusive of dividends, to its predicted market value in the following manner:

$$CS VPE_{TAR} = \left[\frac{Tar CSAMV_{+2} + Divs_{TAR}}{Tar CSEMV_{+2}} \right] - 1, \text{ and}$$

$$CS VPE_{ACQ} = \left[\frac{Acq CSAMV_{+2} + Divs_{ACQ}}{Acq CSEMV_{+2}} \right] - 1,$$

$$CS VPE_{Comb} = \left[\frac{Comb CSAMV_{+2} + Divs_{TAR} + Divs_{ACQ}}{Comb CSEMV_{+2}} \right] - 1.$$

Where:

$Divs_{Acq}$ = dividends issued by the acquiring firm during the event window.

$Divs_{Tar}$ = dividends issued by the target bank during the event window.

Abnormal returns for the entire common stock sample are computed as a sum of the individual returns in the following manner:

$$CS\ VPE_{ALL\ TAR} = \left[\frac{\sum (Tar\ CSAMV_{+2} + Divs_{TAR})}{\sum Tar\ CSEMV_{+2}} \right] - 1, \text{ and}$$

$$CS\ VPE_{ALL\ ACQ} = \left[\frac{\sum (Acq\ CSAMV_{+2} + Divs_{ACQ})}{\sum Acq\ CSEMV_{+2}} \right] - 1,$$

$$CS\ VPE_{ALL\ Comb} = \left[\frac{\sum (Comb\ CSAMV_{+2} + Divs_{ACQ} + Divs_{TAR})}{\sum Comb\ CSEMV_{+2}} \right] - 1,$$

4.2 Preferred Stock VPE

The methodology used to calculate the post- merger expected price of the preferred stock is to derive a predicted value for the preferred stock using a benchmark to capture any changes in the price of the preferred stock due to macroeconomic factors. The predicted post- merger value of the preferred stock is then compared to the actual value of the preferred stock to compute post- merger abnormal returns.

Using the general formula for the valuation of stock with a constant dividend, I derive a pre- merger yield for each preferred stock in the sample. The pre- merger preferred stock yield is computed as:

$$PS\ Yield_{(j,-2)} = \frac{Div_j}{PSMP_{(j,-2)}}$$

Where:

Div_j = the annual dividend for preferred stock j.

$PSMP_{(j,-2)}$ = the market price of the preferred stock at the beginning of the event window.

I then derive a pre- merger yield spread for each preferred stock in the sample as follows:

$$PS\ Yield\ Spread_{(j,-2)} = PS\ Yield_{(j,-2)} - USTreas.BondYTM_{-2}$$

Where:

PS Yield Spread_(j,-2) = the risk premium on preferred stock j at the beginning of the event window.

USTreas.BondYTM_{.2} = the yield to maturity on taxable U. S. Treasury Bonds issues, with maturities of 20 years or greater, at the beginning of the event window. This yield is based on the median yield to maturity of long-term bonds outstanding at the measure date, and is based upon monthly averages of daily index values.

To derive the post- merger predicted value for preferred stock j, I first must compute a post- merger expected yield for the preferred stock. The expected yield for the preferred stock at the end of the event window is derived by adding the preferred stock yield spread to the yield on long-term U.S. Treasury bonds issues in the market at the end of the event window. Thus the post- merger expected YTM and expected price for preferred stock j are as follows:

$$E(YTM_{(j,+2)}) = USTreas.BondYTM_{+2} + PS Yield Spread_{(j,-2)}$$

$$PSEMP_{(j,+2)} = \frac{Div_j}{E(YTM)_{+2}}$$

Where:

PSEMP_(j, +2) = the expected market price of preferred stock j at the end of the event period.

To compute the expected market value, the expected market price is multiplied by the number of outstanding preferred shares. The actual value of the preferred stock is computed as the market price of the preferred stock at the end of the event window, plus any dividends paid during the event window, multiplied by the number of shares

outstanding at the end of the event window:

$$PSAMV_{+2} = [PSMP_{+2} + PSDivs] * SHARES_{+2}$$

Where:

$PSAMV_{+2}$ = preferred stock actual market value at the end of the event window.

$PSMP_{+2}$ = preferred stock market price at the end of the event window.

$PSDivs$ = preferred stock dividends paid during the event window.

$Shares_{+2}$ = the number of shares outstanding at the end of the event window.

To test for abnormal returns as a result of the merger, the post- merger expected price of preferred stock is compared to the actual price of preferred stock at the end of the event window as follows:

$$PS VPE = \left(\frac{PSAMV_{+2}}{PSEMV_{+2}} \right) - 1.$$

Abnormal returns for the entire preferred stock sample are computed as a sum of the individual returns:

$$PS VPE_{Comb} = \left(\frac{\sum PSAMV_{+2}}{\sum PSEMV_{+2}} \right) - 1.$$

4.3 Bond VPE

My analysis of bonds is similar to that used for preferred stock, because unlike common stock, the bonds and preferred stock of both the target and acquiring bank usually continue to exist post- merger. I am therefore able to directly calculate abnormal returns to each bond and preferred stock in the sample. At the beginning of the event window, for each individual bond k in the sample, I find an U. S. Treasury bond outstanding with maturity and interest rate as closely matched to bond k as possible. I

derive a pre- merger yield spread for bond k by subtracting the matched Treasury bond's yield-to-maturity (YTM) from bond k 's YTM. The pre- merger yield spread is thus computed as:

$$Bond\ Yield\ Spread_{(k,-2)} = Bond\ YTM_{(k,-2)} - U.S.Treas.YTM_{-2}$$

Where:

Bond Yield Spread $_{(k,-2)}$ = the risk premium on bond k at the beginning of the event window.

Bond YTM $_{(k,-2)}$ = The YTM on bond k at the beginning of the event window.

U.S. Treas.YTM $_{-2}$ = the YTM on the matched U. S. Treasury Bond at the beginning of the event window.

To derive the post- merger predicted value for bond k , I must first derive a post- merger expected YTM for the bond. Using the same U. S. Treasury bond matched to bond k at the beginning of the event window, the post- merger expected YTM is computed as the pre- merger yield spread for bond k plus the post- merger YTM of the matched Treasury bond. Thus the post- merger expected YTM for bond k is computed as:

$$E(YTM)_{(k,+2)} = U\ S\ Treas.YTM_{+2} + Bond\ Yield\ Spread_{(k,-2)}$$

Where:

$E(YTM)_{(k,+2)}$ = post- merger expected YTM for bond k .

U.S.Treas. YTM $_{+2}$ = the yield to maturity on the matched U.S. Treasury Bond at the end of the event window.

Based upon the general bond formula, and using the post- merger expected YTM, I derive a post- merger expected price for bond k :

$$Bond EMP_{(k,+2)} = \frac{C}{E(YTM)_{(k,+2)}} * \left[1 - \frac{1}{\left(1 + \frac{E(YTM)_{(k,+2)}}{2}\right)^{2M}} \right] + \frac{FV}{\left(1 + \frac{E(YTM)_{(k,+2)}}{2}\right)^{2M}}$$

Where:

Bond EMP_(k,+2) = bond *k* expected market price at the end of the event window.

C = face value of bond *k* multiplied by the coupon rate.

FV = face value of Bond *k*

M = maturity in years

The expected market value of the bond issue is computed by multiplying the bond's expected price by the number of bonds outstanding.

To test for abnormal returns as a result of the merger, bond *k*'s expected market value is compared to the actual post- merger value of the bond. The abnormal return for the bond is calculated as:

$$Bond\ k\ VPE = \left(\frac{Bond\ AMV_{(k,+2)}}{Bond\ EMV_{(k,+2)}} \right) - 1.$$

Where:

Bond AMV_(k,+2) = actual market value of bond *k* at the end of the event window.

Bond EMV_(k,+2) = expected market value of bond *k* at the end of the event window.

Abnormal returns for the entire bond sample are computed as:

$$Bond\ VPE_{Comb} = \left(\frac{\sum Bond\ AMV_{+2}}{\sum Bond\ EMV_{+2}} \right) - 1.$$

Where:

Bond AMV₊₂ = actual market value of each bond at the end of the event window.

Bond EMV₊₂ = expected market value of each bond at the end of the event window.

4.4 Expected Net Gains, Losses and Redistribution of Wealth

To test whether the merger transaction results in a change in value to the combined tradable securities, I will compare the post- merger actual market value of all of the security classes to their pre- merger expected market value.

$$\frac{\text{Merged Bank}}{\text{VPE}} = \left(\frac{\sum \text{All Security Classes } AMV_{+2}}{\sum \text{All Security Classes } EMV_{+2}} \right) - 1.$$

A significantly positive abnormal return indicates that mergers result in a net synergistic gain to the security holders, whereas, a significantly negative abnormal returns indicates that stock mergers do not generate wealth to the security holders. The third possibility is no reaction to the merger announcement, indicating that stock mergers neither generate nor destroy wealth to the securities of the target and acquiring bank.

Abnormal returns can also occur between security classes, and across certain parties in the transaction. I will therefore test for any wealth transfer effects within the security classes by comparing abnormal returns to the target versus the acquiring banks, and between common stock, preferred stock, and bonds. Changes in value across security classes support the theory of wealth redistribution due to such factors as wealth expropriation from bondholders to stockholders or from stockholders to bondholders.

CHAPTER 5

DATA SELECTION

5.1 Merger Sample Selection Criteria

The empirical analysis covers the period from 1994 through 1996 and evaluates mergers involving publicly traded banking institutions. The sample is identified through a search of the merger database maintained by Securities Data Corporation (SDC).

Announcement dates are initially retrieved from SDC, and are confirmed through the Wall Street Journal. The effective date of the merger is obtained from the Center for Research in Security Prices (CRSP) database as the delisting date of the acquired firm.

To be included in the sample, the merger must meet the following criteria:

1. The merger must be a pure stock-for-stock merger; only common stock or preferred stock are used as payment to the target firm's shareholders. The payment method is the method actually used in the transaction, and may differ from the method initially proposed.
2. The acquisition must be for the entire assets of the company. Partial acquisitions, or acquisitions where there are multiple acquiring banks, are not included in the final sample. The merger must result in the delisting of the stock of the target bank, or if new stock is issued to both the shareholders of the target and acquiring bank, the delisting of the stock of both the target and acquiring bank.

3. Both the stock of the acquiring bank and the target bank must trade on the NYSE, AMEX, or NASDAQ, and monthly stock return data must be provided on CRSP tapes.
4. Based upon the year-end financial statements immediately prior to the merger announcement, the total assets of the combined firm must be at least \$5 billion.
5. The assets of the target firm must represent at least 10% of the assets of the acquiring firm.
6. There must be no other significant merger announcement, or other confounding event for the target or acquiring bank for the period from two (2) months prior to the merger announcement date through two (2) months after the closing date of the merger.
7. Information on capital structure and security issues must be available from *Moody's Bank and Finance Manual* or *S & P's Standard Corporate Descriptions* for the acquiring bank, the target bank, and for the combined firm.

The final sample consists of 23 transactions that were announced between 1994 and 1996. Table 5.1 provides a breakdown of descriptive statistics of the banks included in the final sample. As indicated in the data provided, the mean size of the target bank and acquiring bank are \$39.4 billion and \$17.9 billion respectively, resulting in a mean combined asset value of \$57.3 billion. The average total assets of the target bank are 45.7% of the average total assets of the acquiring bank, indicating that the acquisition in the sample represent a substantial economic event for the acquiring bank.

A review of the 23 transactions included in the sample indicate that 8 of the mergers occurred where the home office of both the target and acquiring bank are in the same state (in-market merger) and 15 of the mergers were out-of-state acquisitions.

5.2 Data Sample Selection Criteria

Using Moody's Bank and Finance Manual I collect information on each of the security issues of the target and acquiring bank. Data collected on each security include the maturity date, the preferred stock or bond rating, the coupon interest or dividend payment on the issue, the payment frequency of the coupon or dividend payment, and the face value of the security. I also collect pricing and yield data on each of the security issues in the sample using CRSP tapes and Standard and Poor's Stock and Bond Guides. This information is used to derive a predicted post-merger value for each security. The predicted value is then compared to the actual value of the security to compute any abnormal returns to the security as a result of the merger.

In order to assess merger related abnormal returns to the security classes, I must be able to compute a predicted value and an actual value for the security. Therefore, the final sample includes only those security issues where sufficient information exists to derive a predicted value for the security, and where there was available market pricing information for the security. Whereas it is fairly easy to obtain market-pricing information on publicly traded common stock issues, the availability of pricing information on preferred stock and bond issues is more limited.

Table 5.2 provides information on the number of issues, the issue size, the market value, and the percentage of market capitalization for common stock, preferred stock, and bond securities issued by the target and acquiring bank.

The data sample includes 23 target and acquiring bank common stock. The average market value of the target bank's common stock is \$1.6 billion, which represents 40% of the market value of the acquiring banks. The average market value of the common stock of the combined bank increased by 38% over the event window from \$5.6 billion to \$7.8 billion.

The data sample for preferred stock includes 57 issues; target banks have 22 issues and acquiring banks have 35 issues. The initial sample yielded 72 security issues but the sample was reduced to its present level due to the lack of pricing or dividend data for 4 of the target bank and 11 of the acquiring bank preferred stock issues. The target bank's preferred stock issues declined by 28% over the event period from \$189 million pre- merger to \$136 million after the merger was consummated. But acquiring bank's preferred stock issues remained virtually unchanged pre- versus post- merger.

The bond data sample initially included 299 fixed rate (217) and floating rate bond (82) issues. Since S&P's Bond Price Guide provides only limited information on floating rate bond issues, the floating rate issues were excluded from my bond analysis. Of the fixed rate bond issues in the sample, I was able to find pricing and yield information on 192 of the 217 issues. Target banks had 65 bonds issues valued at \$9.5 billion as of the beginning of the event window. The average issue size was \$146.3 million. Acquiring banks had 127 bond issues, or almost twice the number of issues of target banks. The average market value of acquiring bank issues at the beginning of the event window was \$126.2 million.

There was an increase in the market value of the bonds of the acquiring banks over the event window. The average market value of bonds of the acquiring bank grew

by 36% over the event period. In contrast, post- merger bond market values for the target banks remained unchanged relative to their pre- merger price.

The average market capitalization of the acquiring bank increased 22% over the event window from \$5.2 billion to \$6.4 billion. This growth was spurred by a 29% increase in the average market value of the firm's common stock. The average market capitalization of the target firm grew by 43% over the merger event window. The growth was due to an over 62% growth in common stock market values, which was partially offset by a 28% decline in the average market value of target preferred stock. The average market capitalization of the target firm at the end of the merger was \$3.1 billion.

The average market value of the combined firm increased by 28% over the event window from \$7.5 billion prior to the merger announcement to \$9.6 billion after the merger effective date. The increase in average market values is attributable to the increase in common stock market prices over the evaluation period.

CHAPTER 6

EMPIRICAL RESULTS

In this chapter I present the results of the empirical tests of the hypotheses presented in Chapter 3. Section 6.1 provides VPE results for each security subsample and tests for net synergistic gains and wealth transfer effects across security classes. Section 6.2 examines cross sectional differences in VPEs for in-market and out-of-market mergers. Section 6.3 uses the ordinary least squares regression method to model the relationship between the VPEs of the securities of the target and acquiring bank and certain predictor variables. And Section 6.4 provides a summary of the empirical results.

6.1 Valuation Prediction Error Analysis

In this section, I compare the actual value to predicted value of each security in the sample and derive a valuation prediction error (VPE) for each security class. The VPE for each security class is tested for significance using one parametric and two non-parametric tests. The parametric test is the one-sample t-test to test for a sub-sample mean greater than zero. The two non-parametric tests are the sign test and the Wilcoxon sign rank test. To test for the direction of the change in the predicted to actual value, I employ a sign test. The sign test measures if the number of positive VPEs in the security sample is significantly greater than 50%. The Wilcoxon sign rank test, also known as the Wilcoxon matched-pairs test, is a non-parametric test to test if the median difference between the predicted and actual value of the security sub-sample is significantly different from zero. I consider results to be significant if the parametric test and/or non-parametric tests are significant at the 10% or greater level of significance. The results for each sub-sample are presented in the order of the testable hypotheses provided in Chapter 3, followed by a test of the net synergistic gains for the combined securities included in the individual sub-samples.

6.1.1 Common Stock VPE Analysis

The analysis consists of an empirical test of abnormal returns to 23 target and 23 acquiring banks over an event window beginning 2 months prior to the merger announcement date through two months after the merger effective date. Using the methodology more fully described in Chapter 4 I find results that do not support the synergy hypothesis for mergers. Target firm shareholders experience mean VPEs of 21% over the event window, which are significant at the 5% level when employing the parametric t-test. The t-test is the least stringent of the three significance tests, so I then measure the number of positive VPEs for the sample and the magnitude of the positive returns. Eleven of the 23 target banks experience positive valuation prediction errors over the event window, and the sample had a negative median VPE of 8.4%. When testing for significance of results using both the sign and Wilcoxon sign-rank test, I find that the returns to the target bank are not significant.

Shareholders of acquiring firms realize negative mean VPEs of .96% over the event window, which are insignificant using both the parametric and non-parametric tests. Only 8 of the 23 acquiring bank shareholders experienced positive VPEs over the event window and the median VPE for the acquiring bank was a negative 4.3%.

The merged bank had a weighted average VPE of 3.46%. Eleven of the 23 merged banks had positive VPEs, but again, the returns were not significant for any of the test measures. These results lend support to the hubris or agency theory for mergers, indicating that mergers provide little benefit to the residual claimants of the company.

6.1.2 Preferred Stock VPE Analysis

The sample consists of 57 preferred stock issues by 19 firms. An analysis of the 22-target bank and 35 acquiring bank preferred stock issues was conducted to test for abnormal returns to the owners of the preferred stock. Results indicate that acquiring bank preferred stock experience significantly positive abnormal returns, target bank preferred stock experience insignificant abnormal returns, and returns to the combined

sample are significantly positive. The results from the target firm show that the target bank experiences positive returns of 2.49% over the event window, but the return is not significant. The analysis of VPEs for the acquiring firm indicates a mean VPE of 5.7% that is significant at the 5% level. The test of the number of positive VPEs shows that over 74% of the acquiring firm's preferred stock issues experience positive VPEs as a result of the merger, with the result being significant at the 1% level. The median VPE for the firm is 7.24%, which is also significant at the 1% level. For the combined sample, the preferred stock issues have a mean VPE of 5.7% over the event window, which is significant at the 5% level. For the combined sample, 40 of 57 preferred stock issues had positive VPEs. The test of the number and magnitude of VPEs are both positive and significant at the 1% level. I therefore conclude that mergers do not adversely affect the preferred stock security-holders.

6.1.3 Bond VPE Analysis

The analysis of VPEs of bond securities indicates that mergers positively and significantly affect bond values for both the target and acquiring bank's bondholders. The empirical test to compute abnormal returns to the bondholders consists of computing VPEs for 127 acquiring bank and 65 target bank bond issues. Mean VPEs for the target and acquiring banks are 1.13% and .40%, respectively, both of which are significant at the 10% level. The median VPE for the acquiring bank is .54%, and for the target bank is .85%. A test for the number of positive VPEs in the sample indicates that over 75% of the acquiring bank bond issues, and over 78% of the target bank bond issues experience positive VPEs. These results are significant for both samples at the 1% level. The test of the magnitude of the difference in returns is also significant at the 1% level for both the target and acquiring bank bond issues.

A test of all 192 bond issues included in the sample indicates mean VPEs of .65%. This result is significant at the 5% level. The median VPE for the combined sample is .62% and the number of positive VPE is over 76%. The test of the number of positive

VPEs indicates the number of positive abnormal returns is significant at the 1% level and the magnitude of the return is also significant at the 1%. The results lend support to the synergy hypothesis for mergers and indicate that bondholders clearly benefit from merger activity. These results also support to the coinsurance theory in mergers.

6.1.4 Tests of Net Wealth Gains, Losses, and Redistributions

Thus far, my empirical analysis has indicated insignificant positive returns to common stockholders, significant positive returns to preferred stockholders, and significant positive returns to bondholders as a result of the merger. To test for the net synergistic gains in mergers, I must test the difference in predicted to actual market values for all of the debt and equity securities included in the sample. The data sample consists of 272 common stock, preferred stock, and bond issues, includes 110 target observations, and 185 acquirer observations. The target bank VPE of combined securities indicates a mean VPE of 5.56%, which results are significant at the 5% level. The target bank had a median VPE of .95%, and over 69% of the security issues of the target banks experienced positive VPE. Both of these results are significant at the 1% level.

The acquiring bank experienced results very similar to those of the target bank. The bank had positive abnormal returns of 1.62% for the combined security and the return is significant at the 5% level. The median VPE for the sample is .59% and over 70% of the security issues had VPEs that were positive. The significance test for the magnitude and number of positive VPEs was significant at the 1% level.

The test of the combined target and acquiring bank sample shows that mergers result in positive net synergistic gains to the security holders of the bank. The mean VPE for the combined securities was 1.94% over the holding period, with approximately 73% of all issues experiencing positive abnormal returns. The median VPE for the entire sample is .74% and the test for difference in median is significant at the 1% level. The test for significance in median and for the number of positive VPEs being greater than 50% is also significant at the 1% level.

6.1.5 Summary of VPE Results

Overall, the results indicate that while the merger does not provide significant abnormal returns to the common stockholders, there is wealth creation for the bond security, and to a lesser extent for the preferred stock security class. On a combined basis, mergers result in positive abnormal returns for the tradable securities of the firm. The results do not lend support to the wealth redistribution effect between different security classes or from the acquiring to target firm.

6.2 Cross Sectional VPE Analysis

Siems (1996) found that those mergers resulting in a higher percentage of market overlap (in-market mergers) should realize greater synergistic gains through cost savings. And those mergers that take the acquiring bank into new markets (out-of-market mergers) should offer the combined firm the opportunity to expand its product base and geographically diversify. The author separated the sample into in-market and out-of-market mergers and found that in-market mergers resulted in larger cumulative abnormal returns to the target and acquiring banks.

To test for differences in abnormal returns due to the degree of market consolidation versus geographic diversification, I separate my merger sample into in-market or out-of-market mergers. A merger is classified as in-market if the target and acquiring bank both operate in the same market and product lines prior to the merger. If the acquisition represents an expansion by the acquiring bank into a new geographic or product market, the merger is classified as an out-of-market merger. The merger sample consists of 8 in-market and 15 out-of-market mergers. The securities are also separated into in-market and out-of-market data samples based upon the classification of each merger.

For most of the data sample, there is no difference in results for in-market or out-of-market mergers. The mean VPEs for the common stock of the target and combined firms for in-market and out-of-market mergers are positive and insignificant. The mean

VPE for acquiring banks of in-market mergers, at .82%, is positive but insignificant. The VPE for acquiring banks in out-of-market mergers is negative 1.91%, and is also insignificant. Bond securities experience significantly positive VPEs for the target and acquiring bank in in-market and out-of-market mergers. But VPEs for preferred stock securities are the only security type affected by cross sectional factors. Based upon the classification of the merger sample, the preferred stock data sample is separated into 26 in-market and 31 out-of-market securities. A review of VPEs of preferred stock of banks participating in in-market mergers shows that returns to the preferred stock of the target, acquiring, and the combined firm are positive and significant. The mean VPE of the preferred stock of firms participating in in-market mergers is 6.43% and 8.08% for acquiring and target sample, respectively. These results are significant at the 1% level. The results also indicate that the number of positive returns and the tests for median difference in VPEs is also significant at the 1% level. In contrast, VPEs of preferred stock of banks participating in out-of-market mergers, and for the combined preferred stock sample are insignificant.

6.3 Regressions Analysis of VPEs

I next conduct univariate and multivariate regression analyses that relate the valuation prediction error of each security to financial characteristics of the target and acquirer bank. The independent variables used in my analysis include the market value relative size of the acquirer to the target bank, the leverage ratios of the acquirer and target banks prior to the merger, the change in the leverage ratios of the target and acquirer banks due to the merger, a premium for the type of security being evaluated, and a purchase premium for the merger.

The market value relative size is computed as a ratio of acquirer to target bank market value of equity, and is based upon common stock market prices two months prior to the merger announcement. **Zhang** (1995) tests the relationship between abnormal returns and the market value relative size of the acquirer to the target bank, and found that

abnormal returns are positively correlated to the market value ratio. Thus the greater the difference between the market values of the acquirer bank and the target bank, the more positive the abnormal return. I therefore predict a positive value for the market value relative size coefficient.

The leverage ratios of the target and acquirer banks are computed as the ratio of total debt to total assets. The ratio of the combined leverage of the target and acquirer bank is computed as the ratio of total debt of the target and acquirer to the total assets of the target and acquirer bank. The changes in leverage ratios are computed as the ratio of the combined leverage of the target and acquirer bank to the leverage of the target or the acquirer bank. All ratios are based upon financial figures of the target and acquirer bank for the year-end prior to the merger announcement.

Unless the target and acquirer banks have identical leverage ratios, one firm will experience an increase in leverage and the other firm a decrease when the banks merge. The bonds of the more highly leveraged entity should experience a reduction in default risk due to a decline in its leverage because of the merger. The merger should result in positive wealth effects for the bonds of the more highly leveraged firm. In contrast, the bonds of the less leveraged firm should experience negative wealth effects due to an increase in default risk due to the increased leverage. I therefore predict a positive coefficient for the bank that decreases its default risk and a negative coefficient for the bank that increases its default risk.

The premium for type of security is included to determine if there are any cross-sectional differences in returns based upon the type of security. I expect the coefficient for the debt premium to be negative because the VPEs for debt securities are smaller than those received for common stock and preferred stock securities.

I derive a purchase premium for each merger by computing a purchase price for the shares of the target bank. The purchase premium is computed as a ratio of the market value of the acquisition to the market value of the target's common stock. The market

value of the acquisition is calculated by multiplying the number of target shares outstanding at the beginning of the announcement period by the conversion value specified in the acquisition agreement to derive total shares to the target shareholders at consummation of the merger. I then multiply the total shares to the target shareholders by the acquirer bank's share price at the beginning of the announcement period to derive the market value of the acquisition. The purchase premium is computed as the ratio of the market value of the acquisition to the market value of the target bank's common stock. Purchase premiums are positively related to abnormal returns for the target bank and negatively related to abnormal returns to the acquirer banks, I therefore expect the coefficient estimates for purchase premium for the target and acquirer bank to be positive and negative, respectively.

Table 6.6 provides results from regression analyses of acquirer bank VPEs. Using univariate regression analysis, I test the explanatory power of each independent variable on the VPEs of acquirer securities. The coefficients on the leverage ratio of the target bank, the leverage ratio of the acquirer bank, the change in leverage of the target bank, the change in leverage of the acquirer bank, the common stock premium, and the purchase premium are all insignificant. A review of the leverage ratios of the target and acquiring bank indicate that the leverage ratios of both banks are similar, thus explaining the lack of significance in the leverage tests. The coefficient for the purchase premium is negative as predicted, but is insignificant.

The univariate regression analysis for the acquirer VPEs indicates that the parameters for market value relative size, preferred stock security, and debt security have significant explanatory power in determining acquirer VPEs. The coefficients for the market value relative size is significantly positive indicating that the acquisition of smaller banks, relative to the size of the acquirer bank, is more positively received by the market. The coefficient for the preferred stock parameter is also significantly positive indicating that the preferred stock of the acquirer firm experiences larger than average

VPEs. The coefficient for the debt premium is negative and significant and reflects the smaller abnormal returns received by the debt securities in the merger.

I also test VPEs using a multivariate regression analysis and results show that the market value relative size and the preferred stock premium parameter continue to have significant explanatory power in predicting abnormal returns. The coefficients for each parameter, at .01 and .07 respectively, are significant at the 1% level.

Table 6.7 provides results from regression analyses of target bank VPEs, and results are similar to those found in the regression analyses of the acquirer returns. The coefficients for the leverage parameters are insignificant in the univariate and multivariate tests, reflecting the similar financial structure of the target and acquirer banks. As predicted, the parameter for purchase premium is positive, but is insignificant in the target regression analysis. The coefficient for the common stock premium is positive and significant indicating target stockholders earn significantly higher abnormal returns in the merger. The market value relative size is also positive and significant indicating that the smaller the target bank relative to the acquirer bank, the larger the abnormal return. The multivariate regression analysis also indicates that market value relative size and common stock premium parameters are significantly related to target security VPEs.

6.4 Summary of Empirical Results

In this chapter I review the empirical results obtained in my analysis of abnormal returns to the equity and debt securities of target and acquiring banks participating in 23 mergers from 1994-1996. Results indicate significantly positive returns to the debt securities of target and acquiring banks, and to preferred stock securities of target and acquiring banks that participate in in-market mergers. The returns to common stock securities are insignificantly positive for target firms, and negative and insignificant for the acquiring firm. Results to the combined common stock sample are also insignificant. Results to the combined sample of debt and equity securities are significantly positive, which indicate that mergers create wealth for the holders of the debt, and the wealth is not

created at the expense of the common stockholders. These results are in contradiction to research on debt securities that predict a redistribution of wealth from common stockholders to debt securities in non-synergistic mergers. Overall, I feel results support the synergy theory for mergers since returns to the common stock securities are non-negative, returns to the preferred stock and debt securities are positive, and the returns to the combined sample are positive.

CHAPTER 7

SUMMARY AND CONCLUSION

This dissertation empirically tests the effect of mergers on the tradable securities of banks. The dissertations test for positive net gains to the security holders of target and acquiring banks, and test for wealth redistribution between security classes. The procedure used to test for wealth changes due to mergers is a valuation prediction error methodology that compares a post- merger predicted value to the security's actual value.

Results document the presence of significantly positive abnormal returns to the bondholders of the target and acquiring banks (coinsurance of debt theory). Returns to the common stock of the target bank are positive and insignificant. Returns to the acquiring banks are negative and insignificant, and returns to the common stock of the combined firm are positive and insignificant.

The test for net synergistic gains indicates that returns to the combined sample are positive and significant (synergy hypothesis). Results do not indicate any wealth transfer effects as a result of the merger.

None of the theories presented fully describe the results of my analysis. The increase in the value of debt securities lends support for wealth redistribution in a non-synergistic merger. But since there is no resultant decline in value of the common stock, this theory is not fully supported by the data provided. The common stockholders of the merged firms are not adversely affected, as a result of the merger, and the abnormal return in value of the securities of the combined firm are positive and significant. I therefore feel

that the merger lends support for the synergy theory of mergers since the merger results in a reduction in the default risk of the firm's debt, and an increase in the market value of the securities of the combined firm.

I feel that this dissertation has the potential to add a significant contribution to previous literature on the effects of mergers on the different security claimants of the firm, but I feel that certain modifications are needed to enhance the value of the research.

The sample needs to be expanded across a longer period and to a larger sample of mergers. This will help reduce any concerns that results are due to the limited sample being tested.

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APPENDICES

Table 5.1
Descriptive Statistics of Transactions in Data Sample

This table provides summary statistics on assets for a sample of 23 mergers from 1994-1996. Bank mergers are all completed acquisitions of a banking firm using preferred stock or common stock as the acquisition method in the merger. The sample is restricted to mergers with combined assets of the target and acquiring bank of at least \$5 billion as of the year-end just prior to the merger announcement, and a ratio of book value of assets of the target to the acquiring bank of at least 10%. Asset values are provided in millions of dollars and are determined using Moody's Bank and Finance Manual.

Year of Announcement	# of Transactions (%)	Mean Total Assets of Acquirer (Median)	Mean Total Assets of Target (Median)	Mean Total Combined Assets (Median)	Mean Total Assets of Target/Total Assets of Acquirer (Median)	# of In- Market Mergers (%)	# of Out-of- Market Mergers (%)
1994	4	56,916 (17,831)	10,033 (7,461)	66,948 (25,292)	43.86 (39.00)	2 (25.0)	2 (13.3)
1995	17	38,175 29,325	21,392 (8,793)	59,567 (37,339)	48.65 (35.43)	5 (62.5)	12 (80.0)
1996	2	14,790 (14,790)	3,570 (3,570)	18,360 (18,360)	24.78 (24.78)	1 (12.5)	1 (6.67)
	23	\$39,401 (\$26,385)	\$17,867 (\$7,916)	\$57,267 (\$33,392)	45.74 (27.48)	8	15

TABLE 5.2
Data Sample Descriptive Statistics

This table provides summary data on market values of the common stock, preferred stock, and bond securities of the target and acquiring bank at two months prior to the merger announcement and at two months after the merger completion. Market value information is for all common stock, preferred stock, and bond securities included in the final data sample for VPE analysis. Market values are provided in millions of dollars and are determined using CRSP tapes, The S&P Stock Price Guide, and Moody's Bond Price Guide.

Panel A: Common Stock Securities

	No. of Observations	Target Bank	No. of Observations	Acquiring Bank	No. of Observations	Combined Bank
Prior to Merger						
Mean	23	1,596.1	23	4,041.3	23	5,637.0
Median		716.5		3,404.5		4,285.0
Post Merger						
Mean	23	2,591.0	23	5,233.4	23	7,824.3
Median		1,087.3		4,760.1		5,638.3

Panel B: Preferred Stock Securities

	No. of Observations	Target Bank	No. of Observations	Acquiring Bank	No. of Observations	Combined Bank
Prior to Merger						
Mean	22	189.7	35	176.4	57	181.5
Median		141.7		182.9		157.5
Post Merger						
Mean	22	136.4	35	178.1	57	162.0
Median		117.9		201.0		169.5

Panel C: Bond Securities

	No. of Observations	Target Bank	No. of Observations	Acquiring Bank	No. of Observations	Combined Bank
Prior to Merger						
Mean	65	146.3	127	126.3	192	166.1
Median		106.5		103.7		105.6
Post Merger						
Mean	65	145.6	127	171.7	192	162.9
Median		106.2		102.7		103.5

Table 6.1
Valuation Prediction Error Analysis of Common Stock Securities

This table examines differences in actual and predicted market values of the common stock securities of 23 target and acquiring banks that undertake mergers from 1994-1996. Differences in actual and predicted values are computed using a valuation prediction error methodology. Mean values, median values, and percent positive figures are reported. Tests of statistical significance are indicated by asterisks where ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. Significance statistics include a t-test which measures if the mean VPE is different from zero, a Wilcoxon signed rank test, which measures if the difference in medians of the two samples is different from zero, and a sign test, which measures if the number of positive VPEs is greater than 50%.

Common Stock Description	Number of Observations	Mean VPE	VPE T-stat	Median VPE	Wilcoxon Statistic	Percent Positive	Sign Statistic
All Mergers	26	3.46%	0.72	-5.49%	0.06	47.8%	-.21
Acquirers	26	-.96%	-.40	-4.30%	-.90	34.8%	-1.45
Targets	26	21.04%	1.73**	-8.43%	1.24	47.8%	-.21

Table 6.2
Valuation Prediction Error Analysis of Preferred Stock Securities

This table examines differences in actual and predicted market values of the preferred stock securities of 23 target and acquiring banks that undertake mergers from 1994-1996. Differences in actual and predicted values are computed using a valuation prediction error methodology. Mean values, median values, and percent positive figures are reported. Tests of statistical significance are indicated by asterisks where ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. Significance statistics include a t-test which measures if the mean VPE is different from zero, a Wilcoxon signed rank test, which measures if the difference in medians of the two samples is different from zero, and a sign test, which measures if the number of positive VPEs is greater than 50%.

Preferred Stock Description	Number of Observations	Mean VPE	VPE T-stat	Median VPE	Wilcoxon Statistic	Percent Positive	Sign Statistic
All Mergers	57	5.70%	2.28**	7.24%	2.63***	70.2%	3.05***
Acquirers	35	7.73%	2.35**	6.61%	2.56***	74.3%	2.87***
Targets	22	2.49%	.65	7.89%	1.09	63.6%	1.29

Table 6.3
Valuation Prediction Error Analysis of Debt Securities

This table examines differences in actual and predicted market values of the debt securities of 23 target and acquiring banks that undertake mergers from 1994-1996. Differences in actual and predicted values are computed using a valuation prediction error methodology. Mean values, median values, and percent positive figures are reported. Tests of statistical significance are indicated by asterisks where ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. Significance statistics include a t-test which measures if the mean VPE is different from zero, a Wilcoxon signed rank test, which measures if the difference in medians of the two samples is different from zero, and a sign test, which measures if the number of positive VPEs is greater than 50%.

Bond Description	Number of Observations	Mean VPE	VPE T-stat	Median VPE	Wilcoxon Statistic	Percent Positive	Sign Statistic
All Mergers	192	.65%	1.98**	.62%	6.17***	76.6%	7.36***
Acquirers	127	.40%	1.38*	.54%	4.58***	75.6%	5.77***
Targets	65	1.13%	1.45*	.85%	4.20***	78.5%	4.59***

Table 6.4
Test of Net Synergistic Gains in Stock-for-Stock Mergers

This table examines differences in actual and predicted market values of the debt and equity securities of 23 target and acquiring banks that undertake mergers from 1994-1996. Differences in actual and predicted values are computed using a valuation prediction error methodology. Mean values, median values, and percent positive figures are reported. Tests of statistical significance are indicated by asterisks where ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. Significance statistics include a t-test which measures if the mean VPE is different from zero, a Wilcoxon signed rank test, which measures if the difference in medians of the two samples is different from zero, and a sign test, which measures if the number of positive VPEs is greater than 50%.

Stock Description	Number of Observations	Mean VPE	VPE T-stat	Median VPE	Wilcoxon Statistic	Percent Positive	Sign Statistic
All Mergers	272	1.94%	2.76***	.74%	5.39***	72.8%	7.52***
Acquirers	185	1.62%	2.18**	.59%	3.77***	70.3%	5.51***
Targets	110	5.56%	2.02**	.95%	2.67***	69.1%	4.00***

Table 6.5
Valuation Prediction Error Analysis of In-Market versus Out-of-Market Mergers

This table examines differences in the actual and predicted market values of the debt and equity securities of 23 target and acquiring banks that undertake mergers from 1994-1996. Merger type are separated by whether the acquiring firm had investments in the same markets as the target firm prior to the merger announcement (in-market merger), or the acquisition represented an expansion by the acquiring firm into a new market (out-of-market merger). Differences in actual and predicted values are computed using a valuation prediction error methodology. Mean values, median values, and percent positive figures are reported. Tests of statistical significance are indicated by asterisks where ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. Significance statistics include a t-test which measures if the mean VPE is different from zero, a Wilcoxon signed rank test, which measures if the difference in medians of the two samples is different from zero, and a sign test, which measures if the number of positive VPEs is greater than 50%.

Panel A: Common Stock Securities

	No. of Obs.	Mean	T-test	Median	Wilcoxon Statistic	Percent Positive	Sign Statistic
In-Market Merger							
Combined	16	13.10%	1.01	.51%	.10	50.0%	.00
Acquirer	8	.82%	.21	.51%	.14	50.0%	.00
Target	8	25.38%	-.95	-4.64%	.28	50.0%	.00
Out-of-Market Merger							
Combined	30	8.41%	1.20	-5.67%	.05	36.7%	-1.46
Acquirer	15	-1.91%	-.61	-4.77%	-1.19	26.7%	-1.81
Target	15	18.73%	1.41	-8.43%	1.19	46.7%	-.26

Panel B: Preferred Stock Securities

	No. of Obs.	Mean	T-test	Median	Wilcoxon Statistic	Percent Positive	Sign Statistic
In-Market Merger							
Combined	26	7.13%	7.26***	7.89%	4.28***	96.2%	4.71***
Acquirer	15	6.43%	4.08***	4.48%	3.07***	93.3%	3.36***
Target	11	8.08%	8.97***	8.98%	2.93***	100.0%	***
Out-of-Market Merger							
Combined	31	4.51%	.99	-.65%	1.35	48.4%	-.18
Acquirer	20	8.69%	1.53	24.64%	2.05**	60.0%	.89
Target	11	-3.11%	-.42	-6.14%	-.89	27.3%	-1.51

Panel C: Bond Securities

	No. of Obs.	Mean	T-test	Median	Wilcoxon Statistic	Percent Positive	Sign Statistic
In-Market Merger							
Combined	78	.86%	2.13**	.76%	4.68***	84.6%	6.11***
Acquirer	43	.26%	.63	.64%	4.11***	86.1%	4.73***
Target	35	1.47%	2.70***	1.01%	2.62***	82.9%	3.89***
Out-of-Market Merger							
Combined	114	.51%	1.06	.49%	3.95***	71.1%	4.50***
Acquirer	84	.42%	1.27	.31%	2.67***	70.2%	3.71***
Target	30	.73%	.47	.76%	3.32***	73.3%	2.56***

TABLE 6.6
Univariate and Multivariate Regression Analyses of Valuation Prediction Errors of Acquirer Securities

This table examines the affect of independent variables on the VPEs of debt and equity securities of 20 acquirer banks that participate in 23 mergers from 1994 - 1996. The dependent variable is the valuation prediction error. Independent variables include the ratio of acquirer to target bank market value of equity (*MV Relative Size Premium*), the ratio of total debt to total assets of the acquirer bank (*Leverage Ratio of Acquirer*), the ratio of total debt to total assets of the target bank (*Leverage Ratio of the Target*), the ratio of the combined leverage of the target and acquirer bank to the leverage of the acquirer bank (*Change in Acquirer Leverage*), the ratio of the combined leverage of the target and acquirer bank to the leverage of the target bank (*Change in Target Leverage*), a dummy variable that equals 1 if the security is common stock and 0 otherwise (*Common Stock Premium*), a dummy variable that equals 1 if the security is preferred stock and 0 otherwise (*Preferred Stock Premium*), a dummy variable that equals 1 if the security is debt and 0 otherwise (*Debt Premium*), and the premium paid by the acquirer above the market value of the target stock (*Purchase Premium*). The *Leverage Ratio of Acquirer* and the *Change in Acquirer Leverage* are based upon financial figures of the acquirer and/or target banks for the year-end prior to the merger announcement and are computed as a ratio of total debts to total assets. The *Purchase Premium* is computed as the ratio of the market value of the acquirer's offer divided by the market value of the target's common stock. The *MV Relative Size Premium* and the *Purchase Premium* are based upon market values of common stock two months prior to the merger announcement. T-statistics are provided in parentheses where ***, **, and * denote significance at the 1, 5, and 10 percent levels, respectively.

Variables	Valuation Prediction Error of Debt and Equity Securities of Acquirer Bank									
Intercept	-0.03 (-2.14)**	0.76 (1.27)	0.02 (0.78)	0.02 (2.00)**	0.02 (2.03)**	0.02 (2.50)**	0.002 (0.24)	0.04 (3.27)***	0.02 (1.69)*	-0.04 (-3.26)***
MV Relative Size Premium	0.01 (4.41)***									0.01 (4.50)***
Leverage Ratio of Target		-0.81 (-1.24)								
Leverage Ratio of Acquirer			-0.002 (-0.07)							
Change in Target Leverage				-0.002 (-0.04)						
Change in Acquirer Leverage					-0.0002 (-0.03)					
Common Stock Premium						-0.03 (-1.31)				
Preferred Stock Premium							0.08 (4.14)***			0.07 (4.23)***
Debt Premium								-0.04 (-2.45)**		

Purchase Premium									-0.03 (-0.61)	
Adjusted R ²	0.09	0.00	-0.01	-0.01	-0.01	0.00	0.08	0.03	0.00	0.17
F-Stat	19.49***	1.54	0.00	0.00	0.00	1.71	17.12***	6.02**	0.37	19.58***
N	185	185	185	185	185	185	185	185	185	185

Table 6.7
Univariate and Multivariate Regression Analyses of Valuation Prediction Errors of Target Securities

This table examines the affect of independent variables on the VPEs of debt and equity securities of 23 target banks that are acquired in mergers from 1994 - 1996. Independent variables include the ratio of acquirer to target bank market value of equity (*MV Relative Size Premium*), the ratio of total debt to total assets of the acquirer bank (*Leverage Ratio of Acquirer*), the ratio of total debt to total assets of the target bank (*Leverage Ratio of the Target*), the ratio of the combined leverage of the target and acquirer bank to the leverage of the acquirer bank (*Change in Acquirer Leverage*), the ratio of the combined leverage of the target and acquirer bank to the leverage of the target bank (*Change in Target Leverage*), a dummy variable that equals 1 if the security is common stock and 0 otherwise (*Common Stock Premium*), a dummy variable that equals 1 if the security is preferred stock and 0 otherwise (*Preferred Stock Premium*), a dummy variable that equals 1 if the security is debt and 0 otherwise (*Debt Premium*), and the premium paid by the acquirer above the market value of the target stock (*Purchase Premium*). The *Leverage Ratio of Acquirer* and the *Change in Acquirer Leverage* are based upon financial figures of the acquirer and/or target banks for the year-end prior to the merger announcement and are computed as a ratio of total debts to total assets. The *Purchase Premium* is computed as the ratio of the market value of the acquirer's offer divided by the market value of the target's common stock. The *MV Relative Size Premium* and the *Purchase Premium* are based upon market values of common stock two months prior to the merger announcement. T-statistics are provided in parentheses where ***, **, and * denote significance at the 1, 5, and 10 percent levels, respectively.

Variables	Valuation Prediction Error of Debt and Equity Securities of Target Banks									
Intercept	- 0.01 (-0.38)	0.23 (0.10)	0.04 (0.69)	0.06 (1.86)*	0.06 (1.87)*	0.01 (0.49)	0.06 (2.05)**	0.12 (2.81)***	0.01 (0.17)	-0.03 (-0.93)
MV Relative Size Premium	0.03 (2.69)***									0.02 (2.16)**
Leverage Ratio of Target		-0.18 (-0.07)								
Leverage Ratio of Acquirer			0.02 (0.28)							
Change in Target Leverage				0.03 (0.27)						
Change in Acquirer Leverage					-0.01 (-0.31)					
Common Stock Premium						0.20 (2.99)***				0.17 (2.50)**
Preferred Stock Premium							-0.04 (-0.56)			
Debt Premium								-0.11 (-1.96)*		
Purchase Premium									0.26	

									(1.78)	
Adjusted R ²	0.05	-0.01	-0.01	-0.01	-0.01	0.07	-0.01	0.03	0.02	0.10
F-Stat	7.33***	0.01	0.08	0.07	0.10	8.94***	0.31	3.84*	3.17*	6.98***
N	110	110	110	110	110	110	110	110	110	110