

5-2018

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Revisiting Wealth Effects and Merger Premium Determinants in the U.S. Financial Services Industry

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Senior Thesis, Financial Analyst Honors

Program

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Revisiting Wealth Effects and Merger Premium Determinants in the U.S. Financial Services Industry

Abstract

The U.S. financial services industry's gains are generally soaring these days in light of impending deregulation and lower taxes for their clients as well as for themselves, but have they really emerged from the long shadow cast by the global financial crisis? This paper attempts to examine this issue focusing on two aspects of mergers and acquisitions in the U.S. financial services industry: the wealth effects and the merger premiums. Based on a sample of over 2,500 mergers and acquisitions deals completed during the period 2004 through 2016 and using the event study methodology, this study finds that target shareholders continued to post significant gains throughout the crisis period though the number of deals declined dramatically. Bidding firm shareholders went from posting significant but low negative returns to insignificant returns with the number of deals declining dramatically too. Based on a sample of 210 deals, panel regressions used to identify the determinants of merger premiums find the method of payment and product diversification (bank acquiring nonbanks) to be significant determinants before the crisis but not so post-crisis. The study's preliminary findings suggest that merger premiums and consolidation in the industry continue to be motivated by economies of scale and scope.

1. Introduction

The U.S. financial services industry's gains are generally soaring these days in light of impending deregulation and lower taxes for their clients as well as for themselves, but have they really emerged from the long shadow cast by the global financial crisis? This paper attempts to examine this issue focusing on two aspects of mergers and acquisitions in the U.S. financial services industry: the wealth effects and the merger premiums. Based on a sample of over 2,500 mergers and acquisitions deals completed during the period 2004 through 2016 and using the event study methodology, this study finds that target shareholders continued to post significant gains throughout the crisis period though the number of deals declined dramatically. Bidding firm shareholders went from posting significant but low negative returns to insignificant returns with the number of deals declining dramatically too. Based on a sample of 210 deals, panel regressions used to identify the determinants of merger premiums find the method of payment and product diversification (bank acquiring nonbanks) to be significant determinants before the crisis but not so post-crisis. However, both target and acquiring firm characteristics such as Net Interest Margin, Return on Equity, Efficiency ratios among others, continue to be significant post crisis. The Federal Deposit Insurance Corporation reports that the total number of insured banks declined from 7,634 to 5,116 during our sample period; some of these were due to failed banks, others due to consolidation (voluntary and including those that were forced to merge with stronger banks). However, our study's preliminary findings suggest that merger premiums and consolidation in the industry continue to be motivated by economies of scale and scope.

Mergers and acquisitions activity in the financial services industry surrounding the financial crisis from 2004 through 2016 saw an overall decline in number of deals. The industry as a whole experienced large periods of consolidation due to technological advancements, but to what extent

did the financial crisis play a role in the consolidation? Shareholder wealth in mergers and acquisitions for both targets and acquirers experienced changes throughout this time frame surrounding the financial crisis. Meanwhile, the merger premium determinants were consistent in some dimensions yet inconsistent in other aspects.

The rest of the paper is organized as follows. Section 2 presents the related literature. Section 3 develops the hypotheses while Section 4 discusses the data and methodology. Section 5 presents the empirical analysis and results while section 6 summarizes the key findings and conclusions.

2. Literature Review

2.1. Merger Premium Determinants

One strand of Mergers and Acquisitions (M&A) research has focused on the factors driving acquisition premiums, i.e., the value paid to stockholders of the target or acquired entity over and above the known book value of a company. This body of literature can be classified into several categories. First, the studies of the medium of exchange, whether the transaction is paid for with cash, securities, or a mixture of both, suggest strong correlations between the method of payment and the premiums paid to stockholders. Second, prior studies also examine sustained wealth gains for the target's stockholders both in the days leading up to the acquisition as well as for a significant period of time post-acquisition. Third, diversification benefits, at both the product and geographical level, have shown to influence the perceived value of a target for the potential acquirer during mergers and acquisitions. Finally, in addition to these determinants that are relevant across most industries, the banking industry has a few specific financial and regulations- related determinants and the literature reviewed below will also examine this strand of research.

2.2. Medium of Exchange

The literature provides several theories relating the medium of exchange to the premium paid to stockholders of a target in an acquisition. Using a model of takeovers under asymmetric information, Eckbo et al (1990) identify which medium of exchange creates the most value for target shareholders. The main premise here is that acquisitions occur in an imperfect world of asymmetric information where all involved parties do not have access to the same information set at the same time. Their model shows that two-way information asymmetries between the bidder and target leads to an optimal mix of cash and stock as the payment method in the takeover transaction. The identified equilibrium in this model for the true post acquisition value of the bidder revealed to the target based upon the composition of the mixed offer found that this revealed value is increasing and convex in relation to the amount of cash used in the offer. Using this model and a study of 182 acquisitions, Eckbo et al found that the average announcement month abnormal returns for acquisitions for mixed offers, rather than all-cash or all-stock, are significantly positive and larger.

Ang and Cheng (2006) studied the market-driven acquisition theory to determine the role of the medium of exchange in merger premiums paid. The results found in this study prove that overvaluation increases the probability that a bidder will use stock as a medium of exchange over cash and these overvalued acquirers are better off than similarly overvalued non-acquirers. By proving this, Ang and Cheng confirm similar studies showing that cash bids are less overvalued than stock bids and cash targets are undervalued relative to stock targets. In a study specifically focused in the financial industry, Shawky et al (1996) found the medium of exchange and its correlation to the merger premium has a weak relationship compared to other determinants. However, Shawky et al state that transactions acquired with stock as opposed to a cash purchase generate higher premiums paid to the target.

2.3. Wealth Gains of Stockholders

Examining the gains of the both the bidder's and target's stock throughout the acquisition time frame reveals potential time frames during the acquisition process when abnormal returns are expected. Specifically, Asquith (1983) looks at pre-press date period, the press date, the period between the press date and outcome date, the outcome date, and the post-outcome period. The four subgroups that Asquith examines are the target of successful and unsuccessful mergers and the bidder of successful and unsuccessful acquisitions. This study found that an increasing probability of the merger occurring benefits the target's stockholders, while a decrease in probability harms both the bidder's and target's stockholders. In another study done by Asquith et al (1983), the bidder's wealth gains are examined in more detail. Asquith et al found in this study that the twenty-one days leading to the announcement date of the acquisition have significant stockholder gains which fails to support the capitalization hypothesis where gains are captured in the beginning of the acquisition program. The study also found that abnormal returns for the bidder are positively related to the relative size of the target. The study confirms the value-maximizing behavior shown by management of the bidder. In Ang and Cheng's (2006) study, the overvaluation of the bidder, when greater than the target's premium adjusted overvaluation, lead to higher sustained wealth throughout the acquisition timeline compared to similar overvalued non-acquiring firms. In a case study analysis of Westpac Banking Corporation, Buckley and Brown (2000) examine the wealth effect finding that positive abnormal returns over different event horizons for a value-weighted portfolio for both the target and bidder resulted in the market perceiving this acquisition as wealth enhancing. Lastly, Eccles et al (1998) found that low premium deals typically correlated with lower one-year market returns while high-premium deals resulted with higher one-year market returns when controlling for overall market movements.

2.4. Diversification

Diversification for both products that a company can offer and geographically can lead to higher premiums based on the possibility of risk reduction. In Diaz and Azofra's (2009) study of the European banking market, the analysis of how geographical and product diversification can influence premiums is discussed. For product diversification, non-banking institutions, such as investment and insurance companies, acquiring banking institutions and vice versa, may pay higher premiums. However, Diaz et al (2004) study found improved profits do not always exist with diversification and with this knowledge, bidders that industries differ from their targets will tend to pay lower premiums compared bidders within the same industry as their respective target. Premiums paid for geographical transactions of interstate verse intrastate have conflicting results based on research. Jackson and Gart (1999) state that intrastate transactions lead to larger premiums due to reduction of redundant labor and capital inputs. Shawky et al (1996) found that higher premiums are expected in interstate acquisitions supporting higher premiums paid for diversification across state lines.

2.5. Financial Determinants and Unique Characteristics of the Banking Industry

The banking industry's operations are distinct from all other industries. For instance, the banking industry accepts deposits from commercial and retail clients that are transferred to their balance sheet as liabilities. They then use this money to loan out to clients and the loans are then placed as assets on their balance sheets and are used to generate their revenue or interest income. The operations of the banking industry can cause risks for their depositors so the industry is subject to a strict regulatory environment to protect the general interests of the public and overall economy. Interest rates set by the United States Federal Reserve also impact the short-term borrowing, lending, and depository rates that banks operate in which ultimately impacts their net interest

margins, the difference between interest income and interest expense. Financial ratios of the banking industry largely influence the premiums that bidders are willing to pay. These ratios are standard throughout the industry to track the overall operations, capital requirements, and liquidity of banks.

Beatty et al (1987), using a sample of 146 banks, researched the number of domestic branches, total investment securities, total U.S. treasury securities, net loans, total assets, equity capital, net income, debt to equity ratio, weighted average maturity of U.S. treasury investments, ratio of reserve for loan losses to total loans, ratio of loan write-offs to total loans, return of equity, and Herfindahl index as variables included as potential bank merger premium determinants. Brewer (2000) adds return on assets, total loans to total assets, and book value of capital to total assets to the list of variables that can also impact the premium paid for the target, cumulative abnormal returns, and standardized cumulative abnormal returns finding that all these variables can be significant. Another study by Brewer et al (2000) finds that the regulatory environment significantly impacts bank merger activities in general and bank merger prices. Brewer defined the regulatory environment as a pre- to post- Riegle-Neal period where merger bid premiums increased 35% from pre- to post- Riegle-Neal periods. This study also looks at the board of directors on a banking institution finding that independent boards act to increase the wealth of the shareholders of target banks.

Cheng et al (1989) extend the findings of the role of financial characteristics of banks on merger premiums by focusing more on bidder-related characteristics and also including more proxies for the profitability and growth of the target from their financial statements. Their results suggest that some banks try to achieve higher earnings ratios and faster growth resulting in the large

premiums paid while also supporting that better managers, determined by better financial ratios, are willing to pay more for acquisitions.

In Diaz and Azofra's (2009) research, there is a strong emphasis on relative size, the market share of the target and how much of that market overlaps with the bidder, ownership, growth in assets, and cost to income; adding to the list of determinants that had not been discussed previously. Shawver (2005) determines cost savings as a result of the merger as an additional driver of merger premiums, and an estimate of the restructure duplication to the bidder, which was found to be negative and insignificant. This hypothetical synergy factor as a variable for merger premiums is studied in greater detail by Berkovitch and Narayanan (1999) where they found synergy as a primary motive and what leads to positive total gains for shareholders. The consensus in the literature (see Jackson and Gart 1999, Kowalik et al, 2015, and Shawky et al 1996, for instance) is that profitability measures and balance sheet components are both potential determinants of merger premiums. The mixed results generated in the literature could partly be due to the different time frames of regulatory environments and interest rates of the respective sample periods.

3. Hypotheses Development

Cumulative abnormal returns that are significantly positive in the financial industry are expected to be present for the target shareholders surrounding the announcement date. Acquirer shareholders may experience cumulative abnormal returns as well but the expected returns should either be negative or very minimal and insignificant. The medium of exchange will impact the price an acquirer is willing to pay for a potential target. Based upon the literature review, cash offers tend to generate lower premiums than non-cash offers (i.e. stock and a mixture of stock and cash). When an acquirer pays with non-cash, the uncertainties surrounding the future price of the stock of the acquirer will lead to a higher premium as opposed to cash where the value is more determinable. The

geographic diversification that was more relevant in the 1980s and 1990s when regulation would cause a barrier for interstate banking tended to generate larger premiums paid for interstate mergers as opposed to intrastate mergers, but this hypothesis may no longer be relevant due to the changing regulatory environment. Product diversification from a banking institution acquiring a non-banking institution or vice versa tends to be associated with more potential risk from moving outside of the acquirer's area of expertise to generate economies of scope thus leading to a lower premium paid while a banking institution acquiring another banking institution will produce economies of scale and thus a larger premium will be paid. Lastly, profitability and overall measures of financial condition from both the target and acquiring firm impacts the valuation assigned to the potential target.

The main hypotheses for this study can be stated as follows.

Merger premium hypothesis:

H₁0: There are no cumulative abnormal returns to shareholders of the acquirer.

H₁1: There are cumulative abnormal returns to shareholders of the acquirer.

H₂0: There are no cumulative abnormal returns to shareholders of the target.

H₂1: There are cumulative abnormal returns to shareholders of the target.

H₃0: The method of payment will not have an effect on merger premiums.

H₃1: The method of payment will have an effect on merger premiums.

H₄0: Geographic diversification will not have an effect on merger premiums.

H₄1: Geographic diversification will have an effect on merger premiums.

H₅0: Product diversification mergers will not have an effect on merger premiums.

H₅1: Product diversification mergers will have an effect on merger premiums.

H₆0: Targets and acquirers with stronger profitability and financial conditions relative to peers will not reap larger premiums.

H₆1: Targets and acquirers with stronger profitability and financial conditions relative to peers will reap larger premiums.

4. Data and Methodology

The data necessary to complete this study was obtained from Bloomberg under the Mergers and Acquisitions. Under this function, the criteria was originally set to include a time frame between January 1st, 2004 and December 31st, 2016 where the completed transaction date occurred within this time frame. In addition to the time frame, the following screens were applied: (1) the transaction had to be completed, (2) the deal data had to be available, (3) either the target, acquirer, or seller had to operate in the United States, and (4) either the target, acquirer, or seller had to operate as a bank. With these four criteria settings, the final sample size came down to 7,062.

4.1. Data & Methodology: Event Study

For the event study, the software package Eventus© provided the necessary data, where daily cumulative mean abnormal returns were obtained from the center for Research in Security prices (CRSP) resulting in 2,559 transactions. The following four groups categorized the analysis of each event study: returns to acquirer shareholders in deals where both acquirer and target are publicly traded, returns to target shareholders in deals where both acquirer and target are publicly traded, returns to target shareholders in all deals, irrespective of acquirer status (private or public), and returns to acquirer shareholders in all deals, irrespective of target status (private or public). The first event study examines the change in returns before the financial crisis, during the financial crisis, and then after the financial crisis as well as the entire time frame (2004 – 2016). Pre-crisis period in the event study is defined as the beginning of 2004 to the end of February in 2008, the month before the first large global investment bank, The Bear Stearns Companies, was sold to JPMorgan Chase & Co. because of the subprime mortgage crisis. The crisis period was then defined as March 2008 to the end of 2011 and the post-crisis period was defined as the beginning of 2012 to the end of 2016. The cumulative abnormal returns used in this study were benchmarked against

the CRSP value weighted index, however, the CRSP equally weighted market index, the Standard & Poor's 500 index, and the Fama-French daily factors were also analyzed and found similar results to the CRSP value weighted index. Acquisition announcement date defined the event date for the event study with an estimation period of [-250,-50]. The following testing periods resulted in similar cumulative abnormal returns: [-10,10], [-5,5], [-2,2], [-1,1], [-1,0], and [0,1].

4.2. Data & Methodology: Merger Premiums

With the 7,062 results obtained from Bloomberg, only 542 had the available Committee on Uniform Securities Identification Procedures numbers. Firm level data was obtained from Compustat; data unavailability at that stage reduced the sample for the merger premium regression analysis to 210 transactions. The methodology used to test all hypotheses is based on an unbalanced panel regression analysis using ordinary least squares. Regressions included variables Winsorized at a 10% level, although regressions using un-Winsorized variables and variables Winsorized at a 20% level was also tested. Logs were taken of certain variables in order to scale coefficients. All models included time fixed effects. After all models, the White test examined if heteroskedasticity existed. The regressions will reveal the overall determinants of merger premiums on the financial services industry for the entire sample period (2004 – 2016), as well if there is any change in determinants either pre-crisis (2004 – 2007) and post-crisis (2008 – 2016).

The model can be summarized as follows:

$$\begin{aligned} \text{Premium} = & \alpha + \beta_0 \text{RSIZE} + \beta_1 \text{PAYMENT} + \beta_2 \text{T_LTDEBT} + \beta_3 \text{T_NPL} + \beta_4 \text{T_NIM} + \\ & \beta_5 \text{T_ROE} + \beta_6 \text{T_ROA} + \beta_7 \text{T_EQUITY_ASSET} + \beta_8 \text{T_EFFICIENCY} + \\ & \beta_9 \text{A_NIM} + \beta_{10} \text{A_ROE} + \beta_{11} \text{A_ROA} + \beta_{12} \text{A_PROV_LOANS} + \\ & \beta_{13} \text{A_EFFICIENCY} + \beta_{14} \text{PROD_DIV} \end{aligned}$$

Note: RSIZE is the name for the relative size variable defined by Target Assets divided by Bidder Assets plus Target Assets.

5. Empirical Analysis and Results

5.1. Event Study

The first event study (Table 1) examined the four categories of targets and acquirers throughout the entire study sample and then looks to see if the cumulative abnormal returns change surrounding the three periods of the financial crisis; pre-crisis, crisis, and post-crisis. The first category (A) consisted of the returns to acquirer shareholders in deals where both acquirer and target are publicly traded where throughout the entire period, returns remained negative, but only significantly negative returns were found during the pre-crisis stage which may have influenced the entire period returns to remain significantly negative as well. During the crisis period, negative returns were smaller, but insignificant, compared to both pre-crisis and post-crisis categories. When examining the category (D) consisting of returns to acquirer shareholders in all deals, irrespective of target status (public or private), the returns are all positive in all sample periods except the pre-crisis period. In this category, significantly positive returns were only found during the crisis period and then throughout the entire sample period, but not for pre-crisis and post-crisis periods. Similar to category (A), the crisis period experienced the most favorable returns, compared to the pre-crisis and post-crisis periods. Examining the target category (B) of returns to target shareholders in deals where both acquirer and target are publicly traded, significantly positive returns are present in all four periods with largest significant returns before the crisis and the smallest significant returns in the post-crisis period. All returns were significant at the .1% except for the crisis period. The returns to target shareholders in all deals, irrespective of acquirer status (C) had similar results only smaller cumulative abnormal returns. Examining the differences between shareholders in deals where both entities are publicly traded, category (A) and (B), and shareholders in all deals, irrespective of the opposite entities status (public or private), category (C) and (D), provides evidence to support

asymmetric information where private entities influence the shareholders cumulative abnormal returns positively for acquirer shareholders acquiring a private target and negatively for target shareholders that are being acquired by a private institution.

Table 1: Event Study Results: Surrounding the Financial Crisis

The 2 day (-1, 0) Cumulative Mean Abnormal Returns are presented below. *, **, ***, and **** represent significance at the 10%, 5%, 1%, and .1% respectively, based on the Standardized Cross-sectional Test statistic, (StdCSectZ, Boehmer, Musumeci and Poulsen, 1991); followed by the number of firms with positive to negative returns below.

Key

A Returns to **acquirer** shareholders in deals where both acquirer and target are publicly traded

B Returns to **target** shareholders in deals where both acquirer and target are publicly traded

C Returns to **target** shareholders in all deals, irrespective of acquirer status (private or public)

D Returns to **acquirer** shareholders in all deals, irrespective of target status (private or public)

Entire Period	Pre-Crisis	Crisis	Post-Crisis
A -0.38%	-0.56%	-0.11%	-0.48%
-4.377****	-4.226****	-0.152	-2.25
216:306	105:174	31:30	80:102
B 13.75%	14.13%	13.91%	13.04%
12.826****	10.594****	3.088**	7.12****
230:66	130:29	27:17	73:20
C 12.82%	13.75%	12.20%	12.03%
13.797****	11.508****	4.158****	7.229****
296:95	149:35	55:27	85:28
D 0.22%	-0.04%	0.80%	0.13%
0.516*	-2.252	2.689****	1.298
1295:1264	535:597	360:292	400:382

The next event study examines the method of payment, whether cash or non-cash, for the four categories of targets and acquirers (Table 2a). The returns to acquirer shareholders in deals where both acquirer and target are publicly traded (A) for cash payments are negative but not significant while non-cash payments experienced significant negative returns. Returns to acquirer shareholders in all deals, irrespective of target status (D) for cash payments are positive and significant while non-cash payments are still significant but only slightly negative. The returns to target shareholders in deals where both acquirer and target are publicly traded (B) for cash payments

and non-cash payments are both significantly positive, however, non-cash payments have slightly smaller returns than cash payments. The returns to target shareholders in all deals, irrespective of acquirer status (C) are both significantly positive for cash and non-cash payments, but smaller returns are seen for cash payments. Excluding for the influence of asymmetric information, category (A) and (B), where both entities are publicly traded, suggest cash payments are more favorable to acquirer's and target's shareholders while non-cash payments significantly reduce returns to both acquirer's and target's shareholders. This analysis supports that because non-cash payments inherit general risk, shareholders of both entities receive lower returns than using the less risky and well-defined payment of cash.

Table 2a: Event Study Results: Method of Payment

The 2 day (-1, 0) Cumulative Mean Abnormal Returns are presented below. *, **, ***, and **** represent significance at the 10%, 5%, 1%, and .1% respectively, based on the Standardized Cross-sectional Test statistic, (StdCSectZ, Boehmer, Musumeci and Poulsen, 1991); followed by the number of firms with positive to negative returns below.

Key

A Returns to **acquirer** shareholders in deals where both acquirer and target are publicly traded

B Returns to **target** shareholders in deals where both acquirer and target are publicly traded

C Returns to **target** shareholders in all deals, irrespective of acquirer status (private or public)

D Returns to **acquirer** shareholders in all deals, irrespective of target status (private or public)

	Cash	Non-Cash
A	-0.33%	-0.41%
	-1.789	-4.07****
	37:48	176:255
B	14.06%	13.95%
	4.381***	12.16****
	30:13	199:50
C	12.06%	13.57%
	6.833****	12.02****
	90:38	205:53
D	0.44%	-0.05%
	2.717****	-1.682*
	623:533	338:402

The last event study examines the cumulative abnormal returns relating to product diversification whether the transaction involves two identical financial institutions merging or a two financial institutions merging that operate in separate industries, defined through their respective Standard Industrial Classification (Table 2b). The returns to acquirer shareholders in deals where both acquirer and target are publicly traded (A) are only significant for bank vs non-bank mergers but both bank vs bank and bank vs non-bank have negative returns. Returns to acquirer shareholders in all deals, irrespective of target status (D) generate non-significant returns and is only slightly positive in bank vs non-bank. The returns to target shareholders in deals where both acquirer and target are publicly traded (B) generate significant positive returns, but bank vs bank generates higher returns for the target shareholders. The returns to target shareholders in all deals, irrespective of acquirer status (C) are still significantly positive. Excluding for the influence of asymmetric information, category (A) and (B), where both entities are publicly traded, non-product diversification through two banking institutions merging, explain that economies of scope are more favorable to both acquirer's and target's shareholders over economics of scope, which is represented through product diversification, or a banking institution merging with a non-banking institution, where lower returns were experienced by both acquirer's and target's shareholders.

Table 2b: Event Study Results: Banks Acquiring Banks vs. Non-Banks

The 2 day (-1, 0) Cumulative Mean Abnormal Returns are presented below. *, **, ***, and **** represent significance at the 10%, 5%, 1%, and .1% respectively, based on the Standardized Cross-sectional Test statistic, (StdCSectZ, Boehmer, Musumeci and Poulsen, 1991); followed by the number of firms with positive to negative returns below.

Key

- A** Returns to **acquirer** shareholders in deals where both acquirer and target are publicly traded
B Returns to **target** shareholders in deals where both acquirer and target are publicly traded
C Returns to **target** shareholders in all deals, irrespective of acquirer status (private or public)
D Returns to **acquirer** shareholders in all deals, irrespective of target status (private or public)

	Bank vs. Non-Bank	Bank vs. Bank
A	-0.49%	-0.41%
	-4.38****	-1.74
	102:188	53:71
B	12.79%	14.69%
	10.619****	7.088****
	157:47	71:17
C	13.66%	14.58%
	11.752****	7.264****
	195:58	74:18
D	0.04%	0.00%
	-1.422	-1.106
	375:411	97:124

5.2. Merger Premiums

The three panel regressions this study examines includes regressions for the entire sample period (2004 – 2016), regressions for pre-crisis (2004 – 2007), and regressions for post-crisis (2008 – 2016) to see if determinants change over the course of the financial crisis. The three types of independent variables can be categorized as deal specific, profitability measures, and financial condition measures.

5.2.1. Deal Specific Variables

The three deal specific variables examined include method of payment, product diversification, and geographical diversification. The method of payment in mergers resulted in significant results for noncash transactions generating larger premiums than cash transactions for the

entire sample period as well as the pre-crisis period but during the post-crisis period, the method of payment lost significance. When an acquirer uses non-cash as their method of payment, the inherent risks associated with non-cash results in the target to demand a higher premium paid than if the acquirer were to use cash. The product diversification variable, defined as two entities operating in separate industries vs. two entities operating in the same industry, found that two banks merging will result in larger premiums over a bank and a non-banking institution merging. This was also true for the entire sample period and the pre-crisis period but again during the post-crisis period, the product diversification variable lost its significance. Non-product diversification, resulting from two similar entities merging, leading to larger premiums, suggests that acquirers will pay higher premiums for economies of scale over economies of scope. Geographic diversity, which was excluded in the final models but tested as in a univariate regression, found that this determinant is no longer a significant influence in merger premiums to the extent that it was during prior periods, such as the 1980s, and how literature concludes that it is still significant in the European banking market.

5.2.2. Profitability Measures

The profitability measures for targets includes target net interest margins, target return on equity, target return on assets, and target efficiency ratios. Target net interest margins were significant through the entire sample period and the pre-crisis period but not for the post-crisis period. The net interest margin, or the difference between interest income generated and interest paid to their lenders relative to their interest-earning assets, reveals that the target's ability to generate higher profitability from their interest rates will result in larger premiums paid to acquire that target. Target return on equity and target return on assets were significant through the entire sample period, pre-crisis period, and post-crisis period. The return on equity and return on assets, the most common measure of profitability in the banking industry, explains that higher profitable banks result in larger

premiums. The target efficiency ratio, or the operating expenses over total revenue, measures how efficient the operations of a bank are in generating profits. More profitable banks have smaller efficiency ratios due to expense discipline. The target efficiency ratio, which was significant throughout the entire sample period, pre-crisis period and post-crisis period, concludes that higher profitability of targets generate higher merger premiums.

The profitability measures for acquirer includes acquirer net interest margins, acquirer return on equity, acquirer return on assets, and acquirer efficiency ratio. The acquirer net interest margin was significant during the entire sample period and pre-crisis period but not for the post-crisis period, similar to the target net interest margin. The acquirer's ability to generate profitability from interest rates reveals that acquirer's profitability influences merger premiums. The acquirer return on equity and acquirer return on assets were significant during the entire sample period and post-crisis period but not significant during the pre-crisis time period. Acquirers were more motivated to acquire targets with higher profitability during the pre-crisis time period in order to increase their overall profitability measures. During the post-crisis time period, the acquirers own profitability measures in their motivation behind mergers was not as predominant. The acquirer efficiency ratio was significant more during pre-crisis than post-crisis which also confirms the motivation of acquirers to pay higher premiums in the pre-crisis time period to increase profitability measures. Unprofitable acquirers in the post-crisis period did not have the ability to pay higher premiums to increase their profitability measures so only profitable acquirers were able afford paying larger premiums to acquire profitable banks.

5.2.3. Financial Conditions

The financial condition measures for targets include target long-term debt, target non-performing loans, and target equity to assets ratio. The target long-term debt measures the amount of

leverage a target institution operates with which increases the target's enterprise value. The regression reveals that the lower leverage a banking institutions operates with, the higher premium an acquirer is willing to pay due the acquirer not having to assume the target's debt. The target long-term debt was significant in determining merger premiums for the entire sample period and pre-crisis period but not for the post-crisis period. The equity to asset ratio determines the amount of total funding the target has which largely incorporates the target's deposits. The higher the equity to asset ratio of a target bank reveals the lower amount of funding while the lower ratio reveals a higher amount of funding. Similar to the target long-term debt, the target equity to asset ratio was significant in determining merger premiums in the entire sample period and pre-crisis period but not during the post-crisis period. The target non-performing loans examines the strength of the target's loan receivables. The lower amount of non-performing loans would reveal the target's ability to underwrite successful loans and operate with stronger financial conditions. The target non-performing loans was marginally significant during the entire sample period but not during either pre-crisis or post-crisis time frames.

The financial condition measure for the acquirer was the provision for loan loss to loans ratio. This measures the write-offs that the acquirer had compared to their overall loan receivables. A lower provision for loan loss to loans ratio would assume that the acquirer is not writing off a large percent of their loan portfolio and is operating with an overall stronger financial condition. The acquirer provision for loan loss to loans ratio was not significant during the entire sample and pre-crisis period but became significant during the post-crisis period revealing that the acquirer's financial condition was only an influence after the financial crisis where the overall financial condition of banks suffered.

Table 3a presents the panel regression results for Entire sample period (2004 - 2016) with deal premiums as the dependent variable and several independent variables. Relative size was the control variable.

Dependent variable: premium															
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Constant	2.495*** (21.55)	2.745*** (17.48)	2.537*** (21.61)	1.777*** (6.62)	1.905*** (13.84)	2.093*** (14.95)	2.925*** (17.34)	3.492*** (10.15)	1.782*** (4.98)	2.140*** (9.82)	2.183*** (10.27)	2.600*** (18.54)	3.339*** (8.67)	2.343*** (18.71)	1.886* (1.78)
Relative Size	-0.645* (-1.95)	-0.524 (-1.59)	-0.501 (-1.48)	-0.657** (-2.03)	-0.608** (-2.03)	-0.663** (-2.11)	-0.690** (-2.14)	-0.685** (-2.12)	-0.576* (-1.66)	-0.439 (-1.24)	-0.551 (-1.58)	-0.562 (-1.59)	-0.451 (-1.28)	-0.709** (-2.18)	-0.141 (-0.41)
Cash vs. Non-Cash	-0.288** (-2.21)	-0.300** (-2.32)	-0.321** (-2.45)	-0.248* (-1.93)	-0.189 (-1.59)	-0.199 (-1.58)	-0.242* (-1.89)	-0.226* (-1.75)	-0.256** (-2.00)	-0.308** (-2.40)	-0.272** (-2.13)	-0.261** (-2.02)	-0.285** (-2.23)	-0.233* (-1.80)	-0.192 (-1.55)
Target Long Term Debt		-0.0587** (-2.33)													-0.0772** (-2.43)
Target Non-Performing Loans			-0.0444* (-1.83)												0.00845 (0.31)
Target Net Interest Margin				0.205*** (2.95)											0.156* (1.88)
Target Return on Equity					5.174*** (6.62)										2.328 (1.09)
Target Return on Assets						42.92*** (4.64)									25.60 (0.94)
Target Equity to Assets Ratio							-4.932*** (-3.43)								-4.419** (-2.04)
Target Efficiency Ratio								-1.554*** (-3.07)							0.676 (0.82)
Acquirer Net Interest Margin									0.184** (2.06)						0.0614 (0.61)
Acquirer Return on Equity										2.443* (1.84)					4.440** (2.41)
Acquirer Return on Assets											24.86* (1.66)				-31.37 (-1.41)
Acquirer Provision for Loan Loss to Loans Ratio												-32.44 (-1.52)			-15.11 (-0.74)
Acquirer Efficiency Ratio													-1.537** (-2.34)		-1.082 (-1.43)
Product Diversification														0.241*** (2.89)	-0.00919 (-0.09)
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
n	210	210	210	210	210	210	210	210	187	187	187	186	186	210	186
Adjusted R ²	0.472	0.484	0.478	0.492	0.567	0.522	0.499	0.494	0.503	0.501	0.499	0.497	0.506	0.491	0.603

Notes: *, **, and *** represent significance at 10%, 5%, and 1% respectively; and t-statistic values are in parentheses below estimated coefficients.

Table 3b presents the panel regression results for Pre-Crisis sample period (2004-2007) with deal premiums as the dependent variable and several independent variables. Relative size was the control variable.

Dependent variable: premium															
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Constant	2.626*** (18.67)	2.900*** (13.86)	2.666*** (18.74)	1.803*** (4.96)	1.917*** (10.45)	2.182*** (11.69)	3.189*** (13.57)	3.457*** (7.26)	1.290** (2.60)	2.348*** (6.54)	2.438*** (7.98)	2.667*** (12.37)	3.757*** (7.04)	2.436*** (14.84)	0.823 (0.46)
Relative Size	-1.163** (-2.35)	-1.033** (-2.09)	-0.944* (-1.84)	-1.084** (-2.24)	-1.075** (-2.46)	-1.170** (-2.49)	-1.143** (-2.40)	-1.143** (-2.34)	-1.265** (-2.32)	-1.046* (-1.78)	-1.144** (-2.00)	-1.198** (-2.04)	-0.972* (-1.73)	-1.187** (-2.44)	-0.788 (-1.29)
Cash vs. Non-Cash	-0.618*** (-3.15)	-0.599*** (-3.08)	-0.643*** (-3.29)	-0.555*** (-2.88)	-0.365** (-2.03)	-0.518*** (-2.75)	-0.435** (-2.19)	-0.552*** (-2.80)	-0.614*** (-3.27)	-0.656*** (-3.26)	-0.611*** (-3.10)	-0.611*** (-3.06)	-0.678*** (-3.51)	-0.515** (-2.60)	-0.461** (-2.06)
Target Long Term Debt		-0.0650* (-1.75)													-0.0313 (-0.51)
Target Non-Performing Loans			-0.0519 (-1.51)												0.0258 (0.54)
Target Net Interest Margin				0.230** (2.45)											0.224 (1.66)
Target Return on Equity					5.975*** (5.27)										5.242 (0.94)
Target Return on Assets						47.30*** (3.41)									-6.786 (-0.10)
Target Equity to Assets Ratio							-6.812*** (-2.93)								-2.179 (-0.39)
Target Efficiency Ratio								-1.312* (-1.83)							1.377 (0.97)
Acquirer Net Interest Margin									0.357*** (2.82)						0.296* (1.75)
Acquirer Return on Equity										1.996 (0.85)					3.762 (1.22)
Acquirer Return on Assets											15.60 (0.71)				-65.91** (-2.07)
Acquirer Provision for Loan Loss to Loans Ratio												-9.462 (-0.25)			-21.72 (-0.57)
Acquirer Efficiency Ratio													-2.023** (-2.20)		-1.576 (-1.17)
Product Diversification															0.281** (2.15)
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
n	102	102	102	102	102	102	102	102	102	79	79	79	79	79	102
Adjusted R ²	0.090	0.109	0.102	0.135	0.288	0.180	0.156	0.111	0.174	0.093	0.090	0.085	0.141	0.123	0.285

Notes: *, **, and *** represent significance at 10%, 5%, and 1% respectively; and t-statistic values are in parentheses below estimated coefficients.

Table 3c presents the panel regression results for Post-Crisis sample period (2008-2016) with deal premiums as the dependent variable and several independent variables. Relative size was the control variable.

Dependent variable: premium															
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Constant	1.645***	1.775***	1.685***	1.194***	1.473***	1.470***	1.888***	2.957***	1.559***	1.281***	1.296***	1.803***	2.639***	1.517***	2.167
	(10.23)	(9.14)	(9.90)	(3.04)	(9.20)	(9.03)	(7.51)	(5.34)	(3.42)	(5.41)	(5.02)	(10.15)	(3.97)	(8.49)	(1.44)
Relative Size	-0.181	-0.0889	-0.126	-0.244	-0.152	-0.207	-0.217	-0.299	-0.179	-0.0549	-0.191	-0.0215	-0.108	-0.249	0.151
	(-0.43)	(-0.21)	(-0.29)	(-0.58)	(-0.38)	(-0.51)	(-0.51)	(-0.72)	(-0.42)	(-0.13)	(-0.46)	(-0.05)	(-0.25)	(-0.59)	(0.35)
Cash vs. Non-Cash	0.0538	0.0237	0.0301	0.0703	0.0283	0.132	0.0322	0.106	0.0602	0.0460	0.0626	0.0630	0.0973	0.0667	0.0595
	(0.32)	(0.14)	(0.18)	(0.42)	(0.18)	(0.82)	(0.19)	(0.65)	(0.35)	(0.28)	(0.38)	(0.38)	(0.58)	(0.40)	(0.34)
Target Long Term Debt		-0.0398													-0.0897**
		(-1.19)													(-2.24)
Target Non-Performing Loans			-0.0245												0.00360
			(-0.73)												(0.10)
Target Net Interest Margin				0.130											0.106
				(1.26)											(0.89)
Target Return on Equity					3.771***										0.00155
					(3.48)										(0.00)
Target Return on Assets						37.98***									48.73
						(3.23)									(1.49)
Target Equity to Assets Ratio							-2.258								-4.031
							(-1.25)								(-1.59)
Target Efficiency Ratio								-1.729**							0.372
								(-2.47)							(0.34)
Acquirer Net Interest Margin									0.0247						-0.0512
									(0.20)						(-0.39)
Acquirer Return on Equity										3.153**					4.857*
										(2.06)					(1.69)
Acquirer Return on Assets											34.48*				-21.94
											(1.72)				(-0.58)
Acquirer Provision for Loan Loss to Loans Ratio												-51.31**			-3.992
												(-2.05)			(-0.15)
Acquirer Efficiency Ratio													-1.471		-1.226
													(-1.53)		(-1.15)
Product Diversification															0.165
															(1.59)
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
n	108	108	108	108	108	108	108	108	108	108	108	107	107	108	107
Adjusted R ²	0.088	0.092	0.084	0.094	0.182	0.169	0.094	0.134	0.079	0.118	0.106	0.117	0.100	0.103	0.215

Notes: *, **, and *** represent significance at 10%, 5%, and 1% respectively; and t-statistic values are in parentheses below estimated coefficients.

6. Summary and Conclusions

Based on the empirical evidence and analysis, I reject the null hypotheses for H1, H2, H3, H5 and H6 and fail to reject the null hypothesis of H4. The limitations of this paper include only incorporating deals that were completed leading to a survivorship bias and not having the available data to determine growth rates of assets and loans for each firm as a determinant in merger premiums. Also, this paper only examines 100% ownership transactions. Wealth effects and merger premiums continue to be motivated by economies of scale and scope. Target shareholders continued to post significant gains throughout the crisis period though the number of deals declined dramatically. Bidding firm shareholders went from posting significant but low negative returns to insignificant returns with the number of deals declining dramatically too. Non-cash transactions and non-product diversification was significant leading up to the financial crisis but was not a significant influence post-crisis. Merger premiums have consistently been influenced by profitability measures of both the target and bidder. Financial condition measures in determining merger premiums significantly changed from pre-crisis to post-crisis for both the target and acquirer as well. Overall, the financial services industry, although significantly impacted from the financial crisis, has made a rebound.

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Appendix

Table 1a. Initial Number of Deals*, by Year, for the Event Study

Year	Number of Deals	Distribution
2004	366	10.85%
2005	306	9.07%
2006	361	10.70%
2007	321	9.52%
2008	231	6.85%
2009	240	7.12%
2010	249	7.38%
2011	234	6.94%
2012	236	7.00%
2013	183	5.43%
2014	205	6.08%
2015	240	7.12%
2016	201	5.96%
Total	3373	100.00%

*Note: The eventual event study was run on a subset of these deals due to insufficient daily returns data during the estimation period (sample sizes can be obtained by summing the number of firms with positive and negative returns under each run)

Table 1b. Initial Number of Deals*, by Year, for Regressions

Year	Number of Deals	Distribution
2004	575	8.14%
2005	558	7.90%
2006	644	9.12%
2007	668	9.46%
2008	526	7.45%
2009	557	7.89%
2010	644	9.12%
2011	598	8.47%
2012	498	7.05%
2013	411	5.82%
2014	443	6.27%
2015	498	7.05%
2016	442	6.26%
Total	7062	100.00%

*Note: The eventual event study was run on a subset of these deals due to insufficient data

Table 2a: Summary Statistics: Determinants of Premiums

Variable	Obs	Deal Specific		Min	Max
		Mean	Std. Dev.		
Cash vs. Non-Cash	229	0.1135	0.3179	0	1
Geographic Diversification	210	0.5381	0.4997	0	1
Premium	229	1.8502	0.7782	0.7822	3.1681
Product Diversification	210	0.6429	0.4803	0	1
Relative Size	210	0.1819	0.1269	0.0274	0.4022

Table 2b: Summary Statistics: Target Firm Characteristics

Variable	Obs	Target		Min	Max
		Mean	Std. Dev.		
Efficiency Ratio	229	0.6551	0.1048	0.5133	0.8522
Equity to Asset Ratio	229	0.0978	0.0290	0.0607	0.1562
Investments	229	556.3457	805.9621	35.7810	2609.6020
Loan to Assets Ratio	229	0.6592	0.0995	0.4858	0.7993
Long-Term Debt to Equity Ratio	229	0.7875	0.6525	0.0265	2.0429
Net Income	229	23.8679	41.8926	-1.8790	137.7580
Net Interest Income	229	79.3772	102.1115	9.4100	331.5320
Net Interest Margin	229	3.5022	0.5836	2.5600	4.5000
Non-Performing Loans	229	23.9335	34.1610	0.1510	107.3690
Provision for Loan Loss	229	4.8312	7.5494	0	23.7270
Provision for Loan Loss to Loans	229	0.0038	0.0046	0	0.0145
Reserve for Loan Loss	229	19.9890	26.0150	1.5130	85.6640
Reserve for Loan Loss to Loans	229	0.0134	0.0053	0.0061	0.0240
Return on Assets	229	0.0067	0.0054	-0.0042	0.0139
Return on Equity	229	0.0724	0.0619	-0.0518	0.1602
Total Assets	229	2699.4630	3661.0230	319.0270	11798.7800
Total Equity	229	268.3610	375.0126	29.3630	1228.0920
Total Expense	229	156.8133	249.7450	13.4600	821.9070
Total Liability	229	2419.4010	3288.6800	271.1930	10619.4700
Total Loans	229	1692.1400	2257.4650	204.1280	7331.2280
Total Long-Term Debt	229	178.1549	261.0652	2.7800	814.3850
Total Operating Expense	229	127.3414	201.2609	10.8990	664.5960
Total Revenue	229	174.7121	253.5517	16.8620	829.0000

Table 2c: Summary Statistics: Acquiring Firm Characteristics

Variable	Obs	Acquirer			
		Mean	Std. Dev.	Min	Max
Efficiency Ratio	186	0.5804	0.0785	0.4600	0.7025
Equity to Asset Ratio	187	0.1037	0.0236	0.0707	0.1468
Investments	187	3167.9330	4065.3520	159.8060	12993.5400
Loan to Assets Ratio	187	0.6432	0.0794	0.5029	0.7506
Long-Term Debt to Equity Ratio	187	0.6754	0.5342	0.1023	1.6537
Net Income	187	289.7286	513.1194	6.6990	1634.0150
Net Interest Income	187	687.2667	1057.4820	33.8260	3320.3030
Net Interest Margin	187	3.6991	0.4846	2.9500	4.5600
Non-Performing Loans	187	136.7432	206.1356	3.3570	644.0000
Provision for Loan Loss	187	31.5166	55.3807	0	178.6570
Provision for Loan Loss to Loans	186	0.0028	0.0025	0	0.0079
Reserve for Loan Loss	187	140.1064	231.0656	5.2430	770.0000
Reserve for Loan Loss to Loans	186	0.0130	0.0036	0.0081	0.0203
Return on Assets	187	0.0099	0.0032	0.0052	0.0156
Return on Equity	187	0.1023	0.0402	0.0405	0.1679
Total Assets	210	24602.2700	37675.9200	1140.1660	113933.5000
Total Equity	187	2131.1400	3148.5320	113.9750	9731.1660
Total Expense	187	1122.6400	1987.1890	44.6210	6316.2680
Total Liability	187	20147.9900	32030.1800	953.3360	101801.0000
Total Loans	187	15195.6300	24549.8200	659.3900	78153.5200
Total Long-Term Debt	187	1986.9690	3470.2640	31.6440	10218.2800
Total Operating Expense	187	882.6152	1563.3620	36.3180	4978.3300
Total Revenue	187	1639.5820	2977.3150	57.6170	9593.8230

Table 3: Spearman Pairwise Correlations between Merger Premiums and the list of variables in Column 1.

	Entire	Pre-Crisis	Post-Crisis
Relative Size	-0.1787 (0.0095)	-0.1046 (0.2954)	-0.0398 (0.6824)
Cash vs. Non-Cash	-0.0498 (0.4531)	-0.2110 (0.0255)	-0.0109 (0.9073)
Target Long Term Debt	-0.0063 (0.9244)	-0.1461 (0.1242)	-0.1559 (0.0933)
Target Non-Performing Loans	-0.3956 (0.0000)	-0.1763 (0.0629)	-0.2914 (0.0014)
Target Net Interest Margin	0.2579 (0.0001)	0.2493 (0.0080)	0.3049 (0.0008)
Target Return on Equity	0.6316 (0.0000)	0.5532 (0.0000)	0.4660 (0.0000)
Target Return on Assets	0.5340 (0.0000)	0.3356 (0.0003)	0.4579 (0.0000)
Target Equity to Assets Ratio	-0.1784 (0.0068)	-0.2934 (0.0017)	0.1144 (0.2192)
Target Efficiency Ratio	-0.1904 (0.0038)	-0.2968 (0.0015)	-0.3472 (0.0001)
Acquirer Net Interest Margin	0.1420 (0.0525)	0.2912 (0.0092)	0.0720 (0.4591)
Acquirer Return on Equity	0.5027 (0.0000)	-0.0152 (0.8945)	0.1688 (0.0807)
Acquirer Return on Assets	0.4224 (0.0000)	0.0648 (0.5704)	0.2447 (0.0107)
Acquirer Provision for Loan Loss to Loans Ratio	-0.1949 (0.0077)	-0.1475 (0.1945)	-0.2949 (0.0020)
Acquirer Efficiency Ratio	-0.1334 (0.0694)	-0.1991 (0.0786)	-0.2759 (0.0040)
Product Diversification	0.1516 (0.0280)	0.2256 (0.0226)	0.1157 (0.2331)

Notes: p values are in parentheses below estimated coefficients.