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The Economic Efficacy of Banking Mergers: 2006-2008

by
Rachel Vitale & Judy Laux

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Department of Economics and Business
Colorado College
Colorado Springs, Colorado 80903-3298
www.coloradocollege.edu/dept/EC

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Rachel Vitale, Colorado College
rvitale@coloradocollege.edu

Judith A. Laux, Colorado College
jlaux@coloradocollege.edu

Abstract

The most recent financial crisis has spurred a number of mergers and acquisitions in the financial industry, specifically banks. This study examines the hypothesis that mergers and acquisitions did not produce better performing institutions and industries during the 2006 to 2008 period. Data were compiled for six accounting-based ratios for 105 firms directly involved in mergers or acquisitions during this period. An empirical comparison of both firm-to-firm and firm-to-industry performance shows that firms did not benefit from the mergers for the majority of ratios tested. On the whole, these results reveal the inefficiencies of mergers and acquisitions, supporting the hypothesis of this study.

Introduction

Beginning with the 2007 financial crisis, several of America's financial sector firms engaged in mergers and acquisitions, continuing a trend from the mid-1980s and forming the recent merger wave. As a result of the crisis, many banking institutions collapsed, and in some cases, merging provided a means of survival; in other cases, only government intervention ensured that survival. Between December 31, 2006, and December 31, 2010, the total number of U.S. banks fell by 1002 institutions or 12 percent [Wheelock, 2011, 419].

The current study examines a number of these mergers to investigate whether they have ultimately benefitted the performance of the industry. Mergers and acquisitions represent heavily debated and controversial strategies for companies to achieve growth. Whether mergers happen as some sort of restructuring plan for growth and efficiency, as defensive strategies, or because of a managerial desire for empire building, the topic has been extensively researched. The primary reasons behind the academic research include the high number of unsuccessful mergers (even when the appropriate due diligence is done) and managers' seemingly persistent use of mergers and acquisitions given this failure rate. The literature offers two approaches to measuring merger success—examining company stock prices before and after an event to reveal abnormal returns[1] and employing accounting measures to determine financial well being. We employ the latter approach, investigating changes in select accounting measures pre- and post-merger for both sign (positive or negative) and statistical significance.

The following section presents a summary of the merger evaluation literature, focusing on studies that use accounting-based approaches. Then we present our empirical study, which uses six ratios for pre- and post-merger comparison to determine the effectiveness of these mergers in the aftermath of the latest financial crisis. After presenting our findings, we discuss the limitations and avenues for potential future study.

A Brief Review of the Literature

Authors widely cite a 1992 study by Healy et al. that analyzes the post-acquisition performance of the 50 largest U.S. mergers between 1979 and 1984. Using accounting data, specifically pretax operating cash flow returns on assets, scaled by the assets employed, the authors form a return measure that is comparable across time and across firms. They dismiss the use of stock price data, claiming it fails both to determine whether consolidations create real economic gains or to identify the sources of such gains; in addition, from the "stock price perspective, the anticipation of real economic gains is observationally equivalent to market mispricing

[1]Superb studies in this category include Franks et al. [1991], Agrawal et al. [1992], Mitchell and Stafford [2000], and Andrade et al. [2001]. Also, Bruner [2004] offers a fine recap of much of this literature.

[making it] difficult to conceive of a pure stock price study that could resolve the ambiguity in the interpretation of the evidence" [Healy et al., 1992, p. 137]. Moreover, since differences between pre- and post-merger performance may be due to economy or industry-wide shocks, the main benchmark for evaluating performance should be the industry-adjusted performance of the target and bidding firms. These measures are calculated by subtracting the industry mean data from the sample-firm data, an approach we replicate in the current study. The results in Healy et al. suggest that merged firms show significant improvements in asset productivity relative to their respective industries, leading to higher operating cash flows.

Cornett and Tehranian [1992] examine the post-merger performance of large bank mergers from 1982 through 1987 using a method similar to Healy et al. They collect the cash flow and accounting data for a number of firms for a period before and after the merger. One flaw of using this event study approach includes accounting differences between the different types of purchases (pooling or purchasing method). Aware of such differences, along with one-time costs at the time of the merger, Cornett and Tehranian exclude financial data for the year in which the merger occurs. Due to a minor modeling difference, their cash flow performance differs only slightly from that of Healy et al. Furthermore, they examine the relation between their performance measure and the stock market measures used in previous studies. They conclude that merged banks outperform the banking industry and that improved performance is attributable to the ability to attract loans and deposits, to employee productivity, and to profitable asset growth [p. 212]. Once again, we find support for the usefulness of accounting data in measuring merger effectiveness, and we select some of our measures based on these findings.

Piloff [1996] follows the same methodology as Cornett and Tehranian and uses both stock price and accounting-based performance measurement approaches. His sample consists of 48 mergers of publicly traded institutions that took place between 1982 and 1991, and the study analyzes the consistency between the accounting-based results and those based on the market. In addition, Piloff attempts to account for the difference in results by analyzing the extent of the influence of a number of pre-merger variables "related to the size, location and operating performance of merging institutions" [Piloff, 1996, p. 295]. The results suggest that these mergers did not generate positive performance, suggesting the need for further study of the utility of mergers.

The following section presents the data and methodology for our study that investigates, using select accounting ratios, whether the performance of the financial industry has been improved through recent mergers.

Data and Methodology

The complete list of mergers for the 2006 to 2008 period as generated from the Federal Bank of St. Louis includes 1353 mergers among commercial banks, savings banks and savings & loan associations. This study tackles only mergers among commercial banks, decreasing the initial base sample size to 1155.

The additional data used in this study are acquired through the Federal Financial Institution Examination Council (FFIEC) database. This publicly accessible database includes a complete and detailed list of financial reports on financial institutions. We obtain the data for several of the ratios from the Uniform Bank Performance Report (UBPR), which includes a bank's income statement and balance sheet. The Federal Reserve Bank assigns each financial institution a unique Research Statistics Supervision Discount number (RSSD). These numbers are listed with the merger data from the Federal Reserve Bank of St. Louis. Given the large amount of data for each year and due to time restrictions, we randomly chose 35 mergers from each year, resulting in a final sample size of 105 mergers for the 2006 through 2008 period.

This study uses the approach of Cornett and Tehranian [1992], focusing on six selected ratios from a list of twelve provided in their study—two measuring profitability (return on assets, return on equity), one growth (total asset growth rate), one efficiency (the assets per employee ratio), and two special to the banking industry (the net income to total earning assets ratio and the deposits to equity ratio). We hypothesize that these variables, measured at year end, will identify specific areas within the merged banks where improvements, if any, occur. Changes in the pre-and post-merger values are examined, and we test for statistical significance using the t-statistic:

$$t = \left(\frac{\sum_{i=1}^{N} (d_{post} - d_{pre})}{\frac{N}{\sigma / \sqrt{N}}} \right)$$

The pre-merger data are compiled for two years prior to the merger, and the post-merger data for two years following the merger, omitting the year of the merger, as in previous studies. Because four of the ratios are specific to financial institutions, the Mergentonline database employed provides only the ROA and ROE ratios. To generate industry averages for these two variables, we use the SIC number of the industry specific to this study (6022), together with the Russell 2000 index, producing an industry sample of 90 firms. The FFIEC database's Peer Group Average report offers the industry averages as single raw numbers calculated by taking the average of a substantial number of banks (approximately 8000). All six ratios are either calculated or extracted for the industry from the FFIEC. Given that two databases are used for the industry data, we checked for internal validity by comparing the average ROA and the ROE ratios, which produced almost exact values. For the four remaining ratios, the industry average is generated using the individual bank data.

To calculate the t-statistic requires the same number of observations for the firms and industry, so 35 firms are randomly chosen from the 90 to produce the industry sample used throughout the rest of the analysis. Again a test of comparison is done to indentify if reducing the sample size has major effects on the average values, and that is not the case. Finally, for the four remaining ratios (excluding ROA and ROE), we use the industry average for the individual bank values.

Our expectations are that we will see deteriorating (decreasing) ratios for the six measures. In all cases, improvement would be reflected in a positive change, and we hypothesize that mergers will not improve performance. Our results and analysis are described in the following section.

Results and Analysis

Firm to Firm Comparisons

Table 1 summarizes the percentage of firms for which the post-merger results are negative in the firm to firm comparison. Significance indicates the magnitude of the difference. Note that, in all cases except the assets to employee ratio (and the deposits to equity ratio for the 2008 mergers, only), a majority of firms display negative differences, supporting our hypothesis. The return measures (ROA and ROE), in particular, provide the strongest, most consistent evidence that merging fails to improve firm performance, showing both the expected sign and significance in all three years for the first measure and in two of the three years for the second. In all three years, the majority of merged firms reflect a decrease in their profitability ratios.

Table 1

Percentage of Firms with Negative Results, Post-Merger

(Firm to Firm Comparisons)

Merger Year	**ROA**	**ROE**	**Asset Growth**	**Assets to Employee**	**Net Interest to Total Assets**	**Deposits to Equity**
2006	74.29*	77.14	54.29	8.57*	62.86	62.86*
2007	100.00*	85.71*	57.14*	11.43*	60.00*	65.71
2008	57.14*	60.00*	51.42	20.00*	48.57	48.57

* Denotes significant differences at the 95% level

Asset growth shows mixed results, with slightly more than half of the firms displaying negative results, post-merger. The percentage of firms with a positive change in assets per employee post-merger is much greater than those reflecting a negative change, which leads one to believe that, since asset growth remains stable, the merged firms might have slimmed down the workforce as a result of overlap and redundancy. The

effect would be an increase in assets available per worker, which is what we see in the data, with statistical significance at the 95% level for all three years. This result refutes our hypothesis and provides evidence that, at least by this measure, merging results in more efficiency. This efficiency, however, does not manifest itself in higher return measures within the post-merger period tested.

The post-merger performance for net interest income to total assets is negative for the majority of the 2006 mergers, showing significant decline for the 2007 mergers but some (though not statistically significant) improvement for the 2008 mergers. The deposits to equity measure deteriorates significantly in a majority of 2006 mergers, and the 2007 mergers register insignificant declines, but in 2008, slightly more than half of the firms see an improvement in their deposits to equity post merger, though not at a significant level. On the whole, the direction of most measures suggests little post-merger improvement, with the exception of the assets to employee ratio. The following section presents the results for the firm to industry comparisons.

Firm to Industry Comparisons

The firm to industry results (displayed in Table 2) are mixed, making it difficult to establish any distinguishable patterns. The percentage of firms outperforming the industry in the first profitability measure, ROA, increases after the 2006 and 2008 mergers, but barely more than half the firms are outperforming the industry post-merger. All firms in the 2007 merger group actually fared better than the industry pre-merger, but only 57% did so post-merger. Finally, the post-merger difference in performance is never significant. The percentage of firms that improve their ROE ratio increases gradually during the years, but only the 2008 post-merged firms display a significant difference from the industry performance, and then improvement exists for only slightly more than half the firms. Thus, for the profitability ratios, we remain unconvinced that real improvement occurs.

Table 2

Percentage of Firms Outperforming the Industry

Pre- and Post-Merger

(Firm to Industry Comparisons)

Merger Year	**ROA**		**ROE**		**Asset Growth**	
	Pre	**Post**	**Pre**	**Post**	**Pre**	**Post**
2006	37.14	48.57	34.29*	37.14	48.57	54.29
2007	100.00*	57.14	20.00	48.57	42.86	31.42
2008	47.14*	54.29	28.57*	51.43*	28.57	68.57*
	Asset to Employee		**Net Interest to Total Assets**		**Deposits to Equity**	
	Pre	**Post**	**Pre**	**Post**	**Pre**	**Post**
2006	57.14*	60.00*	34.29	45.71	74.28*	45.71
2007	57.14*	51.42*	48.57	45.71	68.57	45.71
2008	31.43*	25.71*	34.29	62.86	51.52*	54.28*

* Denotes significant differences at the 95% level

Asset growth also demonstrates mixed results, with a significant and positive difference in 2008, when 68.7% of the firms perform better than the industry post-merger, compared to only 28.57% pre-merger. The asset to employee ratio is significantly different for all three years, but improvement in 2008 versus the industry decreases to only 25.71% of the post-merged sample. This leads us to believe that, while the firms that merged in 2008 possess more assets, the employee base had not shrunk by the post-merger period. Another explanation is that the repercussions of merging had not fully manifested themselves. Perhaps further analysis of future years is needed to detect the true impact of the merger, particularly in these asset-based ratios. Thus the efficiency measure offers less convincing evidence of improvement on the firm to industry comparison.

The net interest income to total earning assets ratio increases post-merger in all three years, but this improvement is never significant compared to the industry, and only in 2008 does improvement occur for more than a majority. Finally, the deposits to equity ratio decreases for a number of firms in the 2006 and 2007 mergers and registers only a small (yet significant) increase in slightly over half of the 2008 mergers. In sum, the data hardly suggest customers stampeding to borrow (producing net interest income) or to make deposits (strengthening the capital adequacy measure).

Like the firm to firm comparisons before them, the firm to industry comparisons suggest merging did not have an overall positive effect on the banks in our sample. In the following section, we discuss some of the limitations of the current study and offer concluding remarks.

Conclusion

This study has presented the hypothesis that the merger wave of the latest financial crisis was not beneficial to the performance of the banking industry. The foundation of this hypothesis lies in the past outcomes of mergers and acquisitions as well as debatable motives for merging during this period of time. An empirical test of merger performance, both between firms pre- and post-merger and in comparison to the banking industry, revealed a decline in profitability, little improvement in asset growth, and limited improvement in banking-specific measures related to return and capital adequacy. Only the assets to employee ratio (a measure of efficiency) showed a significant, positive difference for the merged firms in all three years on the firm to firm comparison, but even it lacked persuasive power in the industry comparison. On the whole, the observed results support the hypothesis and expose merger and acquisition inefficiency. One should keep in mind that these findings are based on one approach to performance measurement—the use of accounting-based information. This method has numerous disadvantages, discussed in detail in the previous sections. Additionally, the period examined is fairly recent, and the full effects of mergers that happened during this period might not be in full evidence; thus this study might fall short of capturing the complete extent of merger consequences for firms. Finally, our sample size is limited, and future studies might expand it. In general, however, these findings support the hypothesis that mergers were not beneficial to the banking industry during the 2006 through 2008 period.

Author Information

Rachel Vitale is a 2012 Physics and Mathematical Economics graduate from Colorado College whose senior thesis in mathematical economics provided the basis for this work.

Judy Laux is a Gerald L. Schlessman Professor of Economics and Business at Colorado College, teaching and researching in the areas of accounting and finance. She would like to thank the Chapman Foundation for grant support for this project.

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