Evaluating Merger Performance on a Longitudinal Basis: An Empirical Investigation

Ram Subramanian
Grand Valley State University
Allendale, Michigan

Essam Mahmoud
American Graduate School of International Management
Glendale, Arizona

Mary S. Thibodeaux
University of North Texas
Denton,Texas

Bahman Ebrahimi
University of North Texas
Denton, Texas

Introduction

In the past, researchers from a myriad of disciplines have attempted a number of studies on merger performance and related issues. Even using a wide range of performance measures (e.g., stock returns, return on investment, risk, market share), the essence of their results was that mergers benefit the acquired firm and its stockholders, but do not result in any significant benefit to the acquiring firm or its stockholders ([14], [16]).

However, researchers from the field of strategic management have recently found evidence that contradicts the earlier findings of scholars who were predominantly from the finance discipline. The strategic management researchers ([21], [32]), using the same methodology as the finance scholars but with different time frames and slightly different assumptions, have concluded that mergers yield significant benefits to stockholders of both firms.

Thus, a question currently exists as to whether mergers benefit only one (the acquired) or both firms involved. *A priori*, from the recent merger wave [4] it would appear as though both firms benefit. The clarion call for researchers in the area of mergers and acquisitions research is for more micro studies (focusing on individual industries) rather than macro approaches (pooling firms from different industries into one single sample) that examine merger outcomes from a longitudinal perspective ([9], [29]). This is seen as a way of resolving the current controversy that exists regarding merger performance.

The purpose of this study was to measure merger performance on a longitudinal basis using a micro perspective. Specifically, this study looked at the performance of

a sample of mergers drawn from the food and kindred products industry, Standard Industrial Classification Code 20, for a period of five years before and five years after the mergers using two performance measures. The performance measures, namely market returns to stockholders and return on investment, have been used extensively in the literature ([17], [18], [21], [24], [36]) to study the performance of mergers, albeit on macro samples.

Because previous research provides conclusive support for increased returns following a merger to stockholders of acquired firms ([14], [16], [21]), this study uses the two measures mentioned earlier to determine returns only to the acquiring firms' stockholders. Also, because the effect of a merger can best be felt only in the long run [29], performance was measured for a period of five years after the merger and compared to performance five years prior to the merger. Such a longitudinal scope ensured that the anticipated synergies ([6], [7]) have had a chance to be effective.

Theoretical Framework

While Table 1 provides detailed descriptions of an illustrative list of studies on merger performance, this section discusses those studies that have a direct impact on the current work and help in the development of the research hypotheses.

Table 1: Illustrative Studies on Merger Performance

Author(s)	Methodology	Findings
Measure: Returns		
Halpern (1983)	Conceptual—Review of literature.	While empirical evidence points out that mergers bring significant returns to stockholders of acquired firms, not enough evidence exists to suggest the same for the acquiring firms' stockholders.
Jensen and Ruback (1983)	Conceptual—Review of literature.	Stockholders of acquired firms benefit, but not stockholders of acquiring firms.
Lubatkin (1983)	Conceptual—Review of literature.	Empirical studies point out that all significant benefits go to the acquired firm.

Table 1: Illustrative Studies *(Continued)*

		However, the strategic management literature suggests that the acquiring firms get tremendous benefits. These claims have not been supported by empirical evidence.
Lubatkin (1987)	Empirical— Archival data. Sample size 439 acquiring firms and 340 acquired firms. Event study approach using market-based performance measure.	Mergers do lead to permanent gains in stockholder value for both acquiring and acquired firms, but differences not significant across merger types.
Singh and Montgomery (1987)	Empirical— Archival data. 105 firms from the period 1975-1980. Used a market-based performance measure.	Acquired firms in related acquisitions performed better than acquired firms in unrelated acquisitions.
Measure: Risk		
Langeteig, Haugen, and Wichern (1980)	Empirical— Archival data. Sample of 149 firms from the period 1929-1969. Used a self-developed measure of risk.	Mergers increase the risk for the merged firm. Part of the risk is due to increased leverage, other parts not explained by study results.
Lubatkin and O'Neill (1987)	Empirical— Archival data. Sample of 297 firms from the period 1954-1973. Used Beta as a measure of risk.	Lowered risk is a valid rationale for mergers. All mergers increased the unsystematic risk for the merged firm, while related acquisitions lowered the systematic and total risks.

Table 1: Illustrative Studies *(Continued)*

Measure: Market Share		
Mueller (1985)	Empirical— Archival data. Sample of 332 firms from the period 1950-1972.	Mergers result in a loss of market share to the acquired firm.
Hopkins (1987)	Empirical— Archival data. Sample of 64 firms from Fortune 1000 for 1965.	Market share decreased for the acquired firm after the merger except in the case of marketing-related mergers where it went up.
Other Measures		
Montgomery and Wilson (1986)	Empirical— Archival data. Samples of 434 firms that were aquired during 1967-1969.	Used resale value to measure performance. Not enough evidence to suggest that unrelated acquisitions are bad.
Neely and Rochester (1987)	Empirical— Archival data from 37 S&Ls that merged matched with 37 that did not.	Merged savings and loans firms showed significant increases in profits and return on net worth.

In their extensive review of the literature on merger performance, Subramanian, Ebrahimi, and Thibodeaux [37] emphasized the existing controversy regarding merger benefits. Halpern [14] reviewed finance literature on merger performance using an event study approach. He concluded that there exists strong evidence to suggest that higher than normal returns accrue to stockholders of acquired firms following a merger. The findings of the reviewed literature by Halpern [14] were, however, inconclusive regarding the returns to the stockholders of acquiring firms. While Langeteig [18] and Michel, Shaked, and Yobaccio [26] found empirical evidence to suggest that the returns to the stockholders of acquiring firms actually declined after a merger, Mandelkar [24] found that the returns were similar to other investments of comparable risk.

Lubatkin [21] found evidence to suggest gains accruing to stockholders of both the acquired and the acquiring firms. Pettway and Yamada [32] found similar evidence in their study of mergers in Japan. Their conclusion is also supported by the empirical

research of Burgman [5], Chatterjee [7], Shelton [35], and Singh and Montgomery [36]. Thus, while the finance and strategic management disciplines agree on returns to stockholders of acquired firms, they are divided as to the returns to stockholders of acquiring firms. Table 2 summarizes the conclusions of prior research on merger performance.

Table 2: Summary of Conclusions From Prior Research on Merger Performance Using Market Return as Measure

(A) **Inconclusive** evidence regarding merger benefits

Researcher(s)	Methodology
Mandelker (1974)*	Empirical - event study
Langeteig (1978)	Empirical - event study
Michel, Shaked and Yobaccio (1983)	Empirical - event study
Halpern (1983)	Review of literature
Jensen and Ruback (1983)	Review of literature

(B) **Conclusive** evidence regarding merger benefits

Researcher(s)	Methodology
Lubatkin (1983)	Review of literature
Burgman (1984)	Empirical - event study
Pettway and Yamada (1986)	Empirical - event study
Chatterjee (1986)	Empirical - event study
Singh and Montgomery (1987)	Empirical - event study
Lubatkin (1987)	Empirical - event study
Shelton (1988)	Empirical - event study

*actually concluded that mergers provided returns comparable to investments of similar risk

Several explanations, such as different time frames (daily stock data versus monthly stock data) and the use of "clean" data (discarding firms engaged in multiple mergers from sample) by the finance researchers, have been offered to explain these conflicting results [23]. Additionally, recent researchers have emphasized the need to control for industry effects [10] and also to examine merger performance using a longitudinal instead of a cross-sectional time frame in order to fully capture its effect.

Methodology

The study method used for this research was statistical analysis of historical data obtained from published sources. While prior studies ([21], [36]) have used samples of firms drawn from a variety of industries, the analysis group for the current study was composed entirely of firms in the food and kindred products industry (SIC code 20).

This study considered all publicly reported mergers and acquisitions (for which data were available) for the period from 1968 through 1984. The United States Federal Trade Commission's (FTC) Large Merger Series contained in its Statistical Report on Mergers and Acquisitions [11] as well as "Merger Rosters" of various issues of Mergers and Acquisitions were used to identify target firms in the food and kindred products industry.

There are many gaps in the publicly reported mergers and acquisitions activity data. Therefore, some firms were eliminated from the population of firms that were engaged in merger and acquisition activity during the period from 1968 to 1984. Although this reduced the sample size, the number of mergers and acquisitions that occurred during this period remained large enough for statistical analysis.

Based on the guidelines suggested by the FTC [11], the sample of firms was classified into vertical, horizontal, product extension, market extension, and pure conglomerate merger types. A vertical merger occurs when a firm merges with or acquires a firm that supplies it with inputs or are customers for its outputs. A merger or acquisition involving competitors is called a horizontal merger. Merging with or acquiring a firm that makes related products involves a product extension merger. When a firm merges with or acquires another firm for the purpose of increasing its market coverage, it is involved in a market extension merger. Finally, merging with or acquiring a firm that is in a totally unrelated industry is an example of a pure conglomerate merger. This classification system has been used by other researchers [e.g., 21] to study merger performance.

The dependent variable examined in this research study was performance. For the variable performance, two measures were used: accounting return on assets and market return to stockholders.

The accounting return on assets (ROA) measure was calculated based on after-tax earnings (including extraordinary items) on year-end book value of total assets. The use of accounting-based performance measures have been criticized in the literature ([14], [23], [27]). Their use in this study is, however, justified on the ground that they measure an important aspect of performance, namely, the earnings stream that is at the disposal of the acquiring firm as a percentage of the assets employed to earn the return. As an ex-post facto measure, return on assets complements an ex-ante measure such as market return to give a complete picture of performance.

While there are several methods to measure market performance [38], this study used the relationship suggested by Kusewitt [17] in his work on factors associated with acquisitions performance. The justification for using this formula was that it is simple

to understand, easy to use, and is based on sound theoretical grounds. Moreover, it has been used to measure merger and acquisition performance in the past [e.g., 17].

Using Kusewitt's [17] formula, the individual year's market return was computed for each acquiring firm as follows:

$$R = \frac{(P_t + D_t)}{P_{t-1}} - 1 \quad \text{where,}$$

R = return on acquirer's stock for the year,
P_t = arithmetic mean of high and low market price per share of stock in calendar year t,
P_{t-1} = arithmetic mean of high and low market price per share of stock for the previous year, and
D_t = dividend per share in year t.

The market performance of a firm for a period of five years before and five years after a merger was obtained by taking the geometric mean of the individual years' returns. The geometric mean was used because it is a more conservative average than the arithmetic mean and is better suited to account for outliers [8].

Merger type was the independent variable used in the study. Based on the categorization scheme suggested by the FTC [11], the sample of firms was grouped into the five merger types mentioned previously. This independent variable assessed the impact of merger type on performance.

Using Moody's Industrial Manual and Value Line Investment Survey, data on each acquiring company's net income, year-end book value of assets, high and low stock prices, and dividends per share were obtained. Because both Moody's Industrial Manual and Value Line Investment Survey report data only on selected publicly held companies, several firms had to be eliminated from the list. Incomplete data also resulted in the elimination of another set of firms. Finally, 80 of a possible 138 firms for which data were complete were assembled for the study. Since meeting the data requirements was the criterion employed in choosing firms, the sample was not a random sample in the probabilistic sense and any resulting biases could not be avoided.

Results

The descriptive statistics for the analysis group are shown in Table 3. As indicated by the means and standard deviations, the range of performance in the analysis group is remarkably large, particularly when one considers that this is over a ten-year period. Some acquiring firms did extremely well with their acquisition program while others did very poorly. This is indicated very clearly, especially by the jump in the average market return from 9.54 percent before merger to 30.44 percent after merger. This performance variability is consistent with other research findings [e.g., 17]. The descriptive statistics broken down by the type of merger are shown in Table 4.

Table 3: Descriptive Statistics of Analysis Group (n = 80)

	Before	F	After
Return on Assets			
Mean	6.66		7.92
Standard Deviation	2.92		3.58
		4.41*	
Market Return			
Mean	9.54		30.44
Standard Deviation	25.82		24.47
		9.46*	

* significant at the $\alpha_{0.05}$ level

Table 4: Descriptive Statistics of Analysis Group By Merger Types (n = 80)

Merger Type[a]	1	2	3	4	5	F
Mean ROA Before	5.49	7.31	6.80	6.78	6.72	
SD Before	1.32	4.01	3.31	2.63	2.55	
						1.05[b]
Mean ROA After	6.91	7.65	7.34	12.33	8.06	
SD After	2.16	2.62	3.02	6.02	4.01	
Mean Mkt. Ret. Before	7.20	20.23	12.57	6.80	4.68	
SD Before	40.18	33.35	18.75	11.79	29.45	
						1.70[b]
Mean Mkt. Ret. After	39.87	34.83	32.19	27.25	23.34	
SD After	48.91	26.79	17.61	11.97	14.82	
n	16	12	22	10	20	

[a] 1 = horizontal, 2 = vertical, 3 = product extension, 4 = market extension, and 5 = pure conglomerate

[b] not significant at the $\alpha_{0.05}$ level

Vertical mergers reported the highest ROA before merger, and market extension mergers showed the highest ROA after merger. While vertical mergers showed the highest market return before merger, the mean market return after merger was the highest for horizontal mergers. The standard deviations for market return was much higher than those for ROA.

Two hypotheses were generated from a review of the literature. The first dealt with merger performance in general while the second sought to identify differences in performance among merger types. The prior literature is not conclusive as to the benefits accruing to the stockholders of the acquiring firm, nor to differences in merger performance across merger types [21].

Therefore,

$H_0 1$: In the food and kindred products industry, mergers do not result in any change in performance by acquiring firms following the merger.

$H_0 2$: In the food and kindred products industry, there is no difference in performance among merger types.

The following analysis of variance (ANOVA) model was constructed to test the hypotheses:

$Y_{ijk} = \mu + T_i + B_j + C_{k(i)} + \Sigma_{ijk}$ where,

Y = performance measure, i.e., market return or ROA,

T_i = merger type (1 = horizontal, 2 = vertical, 3 = market extension, 4 = product extension, and 5 = conglomerate),

B_j = time period where, 1 = before merger 2 = after merger,

$C_{k(i)}$ = company k within merger type i, and

Σ_{ijk} = error term.

The first hypothesis was rejected at the $\alpha_{0.05}$ level ($F = 9.46$, $PR>F = 0.0034$ for market return; $F = 4.41$, $PR>F = 0.0653$ for ROA) providing support for the contention that mergers did result in improved performance on both measures. However, neither performance measure yielded results to indicate that the difference among merger types was statistically significant. This is consistent with prior research findings by Lubatkin [21].

Discussion

This study attempted to analyze merger performance within an industry-specific domain. Using two performance measures, it offered significant statistical support for the hypothesis that mergers benefit the acquiring firm and its stockholders. This evidence, while being consistent with Lubatkin's [21] findings, contradicts earlier results from the finance discipline reported by Halpern [14] and Jensen and Ruback [16]. This could be attributed to two possible reasons.

First, researchers from the finance discipline used short time frames to measure merger performance–the most common time period used was 180 days before and 180 days after the merger [25]. Presumably, this short time period was used to reduce bias associated with extraneous events. Because market models have been shown to factor in the effects of time [13], it is argued by strategic management researchers [e.g., 23] that a five-year time period captures the strategic impact of a merger better than a shorter time frame. Thus, Lubatkin's [21] study, using a five-year time frame both before and after the merger, reported results that contradicted earlier findings of researchers from the finance discipline.

Second, none of the earlier researchers studying merger performance controlled for industry effects. In other words, their samples included firms from a myriad of industries with no countervailing checks-and-balances to account for this diversity that may have contaminated the results. Lubatkin [21] argues that market models adjust for industry variation. This, of course, assumes a perfectly efficient market. But, other researchers ([3], [10]) report that inefficiencies in the market create "noise," rendering it less than perfect. Limiting the sample to firms from only one industry is one of the ways of controlling for industry effect [10].

In this study, the average ROA for the focus group increased from 6.66 percent to 7.92 percent after the merger—an increase of 18.9 percent compounded for the five-year period. A look at the standard deviation (2.92 before and 3.58 after the merger) indicates that the range of performance in the analysis group was remarkably large. Some acquiring firms did extremely well with their acquisition programs, while others did very poorly. One possible cause of this fluctuation in performance within the analysis group is the fact that for a merger to be successful both pre-merger planning and post-merger integration are important. International Multifoods is a case in point. In the 1970s, the company's strategy was diversification away from flour milling by acquiring consumer foods companies. The strategy did not succeed because the company failed to anticipate the oncoming recession and was timid in the implementation of its plans.

The average market return for the focus group increased from 9.54 percent to 30.44 percent after the merger—an increase of more than 219 percent over the five-year period. Again, the large standard deviations (25.82 before and 24.47 after the merger) reflect the variance in performance among the target group. Market return is an ex-ante measure while ROA is an ex-post facto measure. In other words, while ROA measures the performance of the firm after the event, market return is an anticipatory measure. Stockholders push the market price up or down depending upon their perception of the effects of a merger on a firm. Therefore, market return reflects the net change in the wealth of stockholders during the period under study after factoring in the anticipated benefits that propelled the firm to merge or acquire in the first place, as well as the price paid to the acquired firm.

While the market return for firms such as Coca Cola and Quaker Oats increased more than 200 percent during the study period, stockholders either did not perceive Beatrice's mergers to be strategically viable or felt that the price paid was too steep.

This is reflected by the market price for Beatrice, which actually decreased in the period following its merger.

In some cases, a comparison of the two measures proved very interesting. In the early 1980s, Campbell Soup acquired several food companies including Snow King Frozen Foods and Mrs. Paul's Kitchens. While the stockholders perceived this move as beneficial to them (as reflected by the market return which more than tripled during this period), in effect the ROA actually decreased from 9.2 percent prior to these acquisitions to 8.2 percent after they were acquired. Therefore, while these acquisitions did not help the company's bottom line, they were perceived as strategically sound by the stockholders. In a majority of cases, however, the two performance measures moved in the same direction and, therefore, were consistent.

Like Lubatkin's [21] findings, this study also did not provide empirical support for the contention that one type of merger was better than the other. In other words, there were no significant differences among merger types at the $\alpha_{0.05}$ level. One possible explanation for this is that investors may evaluate mergers on characteristics other than market and product relatedness. Some of the characteristics identified by earlier researchers are the quantity of human capital acquired ([16],[31]), the structural characteristics of the acquired market [12], and the competitive position of the acquired business in each of their respective markets [33]. In addition, the lack of significant difference in ROA among merger types underscores the importance of post-merger integration on the acquiring firm's bottomline. More than the type of merger, it is the management of the merger that affects the acquiring firm's performance.

Two conclusions about the food and kindred products industry emerge from the study. The first is that mergers do benefit the stockholders of both the acquired as well the acquiring firms. The second conclusion is that there does not appear to be a difference in performance across the different types of mergers. The important implication of these two conclusions is that a merger is a viable strategic alternative for improving financial and market performance regardless of the type of merger used. But, to get the most out of a merger, post-merger integration is vital. The human aspect of mergers is an important factor that oftentimes determines the success of such endeavors. Mergers are trying times for employees of both the acquired and the acquiring firms. Fear of job loss or a loss of identity are very pressing concerns for employees of both firms following a merger announcement. Therefore, the financial and strategic success of a merger depends largely on post-merger integration.

Because the study used firms from one industry, its findings are not generalizable across other industry groups. It is also possible that by using other performance measures (such as ability to attract capital and technology, access to markets, etc.) the results could have been different.

There are several areas where further research on merger performance can be done. One, as suggested above, is to use performance measures other than ROA and market return. Such a study could survey the top managers of the acquiring firm to determine their objectives for the merger and empirically analyze if in fact their objectives were achieved. Also, using other methods for controlling for industry effects, such as

stratified samples and measuring all critical dimensions in order to isolate those that are being studied [10], is a research direction that would lead to more generalizable results.

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