

2007-2009 Bear Market and Corporate Takeovers

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Abstract

Mergers and acquisitions (M&A) are among the most popular research topics in finance. The synergistic benefits of and the market reaction to mergers have been studied extensively. However, the impact of financial/economic crises on M&A activities has not been studied sufficiently. In this empirical study, we make a contribution on this subject by studying the financial characteristics of acquisition targets in the U.S. before, during, and after the October 9, 2007-March 9, 2009 bear market. The MANOVA (multivariate analysis of variance) test statistics indicate that the overall financial characteristics of the acquired firms were not significantly different from the financial characteristics of the non-acquired control group firms during the bear market and immediately before and after the bear market. However, we find that the acquiring firms preferred targets with significantly higher total assets turnover ratios before the bear market, with significantly higher inventory turnover ratios during the bear market, and with significantly lower capital expenditure ratios after the bear market.

Keywords: 2007-2009 bear market, acquisition target, financial characteristics, MANOVA (multivariate analysis of variance)

JEL Classification: G30, G34

1. Introduction

Mergers and acquisitions (M&A) have been studied extensively in finance. Poor post-merger performance and bad market reaction to mergers are generally explained by reasons such as hubris (Roll, 1986), managerial entrenchment (Jensen 1986; Morck et al., 1988; Shleifer and Vishny, 1989), empire building (Rhoades, 1983; Black, 1989) and bad judgment (Morck et al., 1990). The focus of most M&A studies has been generally limited to specific countries (see, e.g., Rose, 1987; Trifts and Scanlon, 1987). The M&A literature has traditionally focused more on the acquirers than on the targets. Meric et al. (1991) and Aghigbe et al (2004) have studied the financial characteristics of and the gains to bank acquisition targets.

Value creation in mergers has received considerable attention. Value creation and destruction in mergers have been evaluated extensively in the context of diversification (Lang and Stulz, 1994; Berger and Ofek, 1995; Servaes, 1996). Datta et al (1992) study the factors that affect value creation in mergers and acquisitions. Becher (2004) and Beitel et al. (2004) have studied value creation in bank mergers. An extensive literature review of M&A studies can be found in Schweiger and Goulet (2000), Cartwright and Schoenberg (2006), and DeYoung et al. (2009).

The effect of economic/financial crisis periods on M&A activities has not been studied sufficiently in the extant literature. In this paper, we make a contribution on this subject by studying the financial characteristics of U.S. companies that have been takeover targets during the 2007-2009 bear market. This was the worst bear market in U.S. history since the Great Depression. U.S. stocks lost 55 percent of their market value from October 9, 2007 to March 9, 2009 and many U.S. companies became attractive acquisition targets to both domestic and foreign buyers during this period. For comparison, we also study the January 1, 2005-October 8, 2007 period immediately before and the March 10, 2009-December 31, 2011 period immediately after the bear market.

2. Methodology

Comparing the financial characteristics of different groups of firms with financial ratios has long been a popular research methodology in finance. Altman (1968), Edmister (1972), and Dambolena and Houry (1980) predict bankruptcy by comparing the financial ratios of bankrupt and healthy firms. Stevens (1973), Belkaoui (1978),

Rege (1984), Meric et al. (1991), and Uygur et al. (2012) use financial ratios to identify the financial characteristics of companies which become the target of corporate takeovers. Hutchinson et al. (1988) use financial ratios to identify the financial characteristics of companies, which achieve stock market quotation in the UK. Meric et al. (2000) compare the financial characteristics of Japanese *kieretsu*-affiliated and independent firms with financial ratios.

Several studies use financial ratios to compare the financial characteristics of firms in different countries. Kester (1986) and Wald (1999) compare the capital and ownership structures of firms in different countries. Meric and Meric (1989, 1994) compare the financial characteristics of U.S. and Japanese manufacturing firms. Meric et al. (2003) compare the financial characteristics of U.S. and Canadian manufacturing firms. Meric et al. (2002) compare the financial characteristics of U.S., E.U., and Japanese manufacturing firms.

MDA (Multiple Discriminant Analysis) and MANOVA (Multivariate Analysis of Variance) are the two multivariate statistical methods most commonly used in previous studies to compare the financial characteristics of different groups of firms (see, e.g., Stevens, 1973; Meric et al., 1991). In this paper, we use the MANOVA method (see: Johnson and Wichern, 2007) to compare the financial characteristics of U.S. firms that have been takeover targets with the financial characteristics of a control group of comparable size firms.

ANOVA (analysis of variance) is a special case of MANOVA that focuses on a single variable (see: Wilks, 1932; Bartlett, 1936). It is a statistical inference method to test for significant differences between means of two or more groups. The F statistic is given by

$$F = \frac{SSB}{SSW} \quad (1)$$

Where SSB is data variation between the means of different groups and SSW is data variation within each group.

MANOVA (multivariate analysis of variance) is a generalized form of ANOVA to multi-variant cases. In contrast to the univariate ANOVA, the total variation in MANOVA is not only contributed by the variation within and between groups, it may also be contributed by the interactions among different variables.

The multivariate test statistic Wilks' Lambda is given by

$$A_{Wilks} = \frac{|A_{SSW}|}{|A_{SSW} + A_{SSB}|} \quad (2)$$

where $|A|$ is the determinant of matrix A . Wilks' Lambda can also be transferred into an F statistic in hypothesis testing (see: Bartlett, 1938).

3. Data

Our data collection process consists of three steps. First, we identify the U.S. firms that were acquisition targets during the 2005–2011 period. Secondly, we group these target firms into three categories based on their merger announcement dates. Merger announcements between January 1, 2005 and October 8, 2007 are considered as “Before Crisis” mergers, those between October 9, 2007 and March 9, 2009 are considered as “During Crisis” mergers, and those between March 10, 2009 and December 31, 2011 are considered as “After Crisis” mergers. Lastly, we collect the data from the financial statements of the target U.S. companies.

The mergers and acquisitions data are collected from the Capital IQ database. We first identified the U.S. public firms that were acquisition targets during the 2005–2011 period. We then collected the annual data from the year-end financial statements of the firms from the Compustat database for the fiscal year one year prior to the year of the merger. In order to mitigate the excessive influence of the outliers, we winsorized our sample at the 1% and 99% levels.

As the final step of our data collection, we created a matched-sample control group for the target firms. We matched every target company with a same-size non-acquired public company from the same industry. After determining the matched sample of control group firms, we collected their annual financial statements data from the Compustat database.

Overall, our sample consists of 321 target firms and 321 control group firms. The break-down of the sample based on the merger announcement date is displayed in Table 1. The summary statistics of the targets firms and the control group firms are presented in Table 2. The financial ratios used in the comparisons as measures of the financial characteristics of the firms are presented in Table 3.

Table 1. Sample Information and Number of Observations

| | Before Crisis | During Crisis | After Crisis | Full Sample |
|-------------------------|---------------|---------------|--------------|-------------|
| Target Companies | 83 | 51 | 86 | 220 |
| Control Group Companies | 45 | 25 | 31 | 101 |
| All Companies | 128 | 76 | 117 | 321 |

Table 2. Summary Statistics for the Target and Control Group Companies

| Variables | Target Companies | | | Control Group Companies | | |
|-----------------------|------------------|--------|-----------|-------------------------|----------|-----------|
| | Mean | Median | Std. Dev. | Mean | Median | Std. Dev. |
| Total Assets | 1,652.11 | 360.31 | 4,552.23 | 5,355.90 | 1,151.85 | 18,162.13 |
| Current Assets | 621.04 | 179.74 | 1,847.09 | 1,494.22 | 371.09 | 4,811.61 |
| Net Fixed Assets | 1,031.07 | 134.23 | 3,034.85 | 3,861.68 | 555.55 | 13,477.80 |
| Sales | 1,425.75 | 355.33 | 3,578.92 | 4,305.08 | 553.52 | 14,111.47 |
| Net Income | 88.42 | 11.42 | 436.08 | 278.88 | 24.94 | 862.16 |
| Stock Price per Share | 19.46 | 13.14 | 18.79 | 24.25 | 18.87 | 23.90 |

Table 3. Financial Ratios Used in the Study as Measures of Firm Financial Characteristics

| Financial Ratio Name | Financial Ratio Definition |
|---|--|
| <i>Liquidity</i> | |
| Current Ratio (CUR) | Current Assets / Current Liabilities |
| Quick Ratio (QUR) | (Current Assets - Inventories) / Current Liabilities |
| Liquid Assets Ratio (LAR) | (Cash + Marketable Securities) / Total Assets |
| <i>Asset Management (Turnover) Ratios</i> | |
| Accounts Receivable Turnover (ART) | Sales / Accounts Receivable |
| Inventory Turnover (INT) | Sales / Inventory |
| Fixed Assets Turnover (FAT) | Sales / Net Fixed Assets |
| Total Assets Turnover (TAT) | Sales / Total Assets |
| <i>Financial Leverage</i> | |
| Total Debt Ratio (TDR) | Total Debt / Total Assets |
| <i>Profitability</i> | |
| Net Profit Margin (NPM) | Net Income / Sales |
| Operating Profit Margin (OPM) | Operating Income / Sales |
| Return on Assets (ROA) | Net Income / Total Assets |
| Earning Power Ratio (EPR) | Operating Income / Total Assets |
| Return on Equity (ROE) | Net Income / Common Equity |
| <i>Growth</i> | |
| Capital Expenditures Ratios (CER) | Capital Expenditures / Total Assets |
| <i>Market Value</i> | |
| Market-to-Book Ratio (MBK) | Market Value Per Share / Book Value Per Share |

4. Empirical Findings

4.1 Pre-Crisis Period

The MANOVA test statistics for the pre-crisis period are presented in Table 4. The multivariate F statistic is used to test the null hypothesis that the mean ratio/variable vector for the target firms is not significantly different from the mean ratio/variable vector for the control group. The multivariate F statistic in the table indicates that the null hypothesis should be accepted (i.e., the overall financial characteristics of the two groups of firms are not significantly different).

The univariate F statistics show that the financial characteristics of the two groups of firms are significantly different only in terms of total assets turnover at the ten-percent level. The test result indicates that the acquiring firms preferred targets with significantly higher total assets turnover ratios during the pre-crisis period.

4.2 Crisis Period

The MANOVA test statistics for the crisis period are presented in Table 5. The multivariate test statistic in the table indicates that the overall financial characteristics of the two groups of firms are not significantly different in the crisis period. However, the univariate test statistics show that the two groups of firms are significantly different in terms of the inventory turnover ratio at the ten-percent level. It appears that the acquiring firms preferred targets with higher inventory turnover rates (i.e., targets with a lower level of inventories relative to sales) during this period.

Table 4. MANOVA Statistics for the Pre-Crisis Period: Target Firms vs. Control Group Firms

| Financial Ratios | Means and Standard Deviations† | | Univariate Statistics | |
|---|--------------------------------|------------------|-----------------------|---------|
| | Acquisition Targets | Control Group | F Value | P Value |
| <i>Liquidity</i> | | | | |
| Current Ratio | 2.89 (2.37) | 3.28 (3.28) | 1.19 | 0.28 |
| Quick Ratio | 2.23 (2.17) | 2.41 (2.25) | 0.44 | 0.51 |
| Liquid Assets Ratio | 0.20 (0.19) | 0.21 (0.20) | 0.12 | 0.73 |
| <i>Asset Management (Turnover) Ratios</i> | | | | |
| Accounts Rec. Turnover | 12.88 (22.62) | 12.06 (25.20) | 0.08 | 0.78 |
| Inventory Turnover | 26.19 (50.45) | 22.48 (44.00) | 0.39 | 0.53 |
| Fixed Assets Turnover | 11.53 (18.36) | 9.69 (14.44) | 0.80 | 0.37 |
| Total Assets Turnover | 1.11 (0.62) | 0.98 (0.51) | 3.39* | 0.07 |
| <i>Financial Leverage</i> | | | | |
| Total Debt Ratio | 42.1% (19.9%) | 41.8% (20.7%) | 0.02 | 0.90 |
| <i>Profitability</i> | | | | |
| Net Profit Margin | 0.2% (39.7%) | -5.1% (52.1%) | 0.85 | 0.36 |
| Operating Profit Margin | 2.7% (38.7%) | -0.2% (54.2%) | 0.24 | 0.63 |
| Return on Assets | 3.5% (11.2%) | 3.7% (11.0%) | 1.34 | 0.25 |
| Earning Power Ratio | 6.2% (12.8%) | 5.4% (13.7%) | 0.24 | 0.63 |
| Return on Equity | 5.3% (28.3%) | 2.9% (25.4%) | 0.50 | 0.48 |
| <i>Growth</i> | | | | |
| Cap. Expenditure Ratio | 5.0% (5.0%) | 5.0% (5.1%) | 0.01 | 0.94 |
| <i>Market Value</i> | | | | |
| Market-to-Book Ratio | 2.77 (2.21) | 2.95 (2.85) | 0.30 | 0.58 |
| Multivariate Statistics: | | | 0.76 | 0.72 |

† The figures in parentheses are the standard deviations.

***, **, * indicate that the difference is significant at the 1-percent, 5-percent, and 10-percent levels, respectively.

Table 5. MANOVA Statistics for the Crisis Period: Target Firms vs. Control Group Firms

| Financial Ratios | Means and Standard Deviations† | | Univariate Statistics | |
|---|--------------------------------|------------------|-----------------------|---------|
| | Acquisition Targets | Control Group | F Value | P Value |
| <i>Liquidity</i> | | | | |
| Current Ratio | 2.95 (2.47) | 3.00 (2.23) | 0.02 | 0.90 |
| Quick Ratio | 2.33 (2.28) | 2.31 (2.06) | 0.00 | 0.97 |
| Liquid Assets Ratio | 0.20 (0.21) | 0.19 (0.19) | 0.02 | 0.90 |
| <i>Asset Management (Turnover) Ratios</i> | | | | |
| Accounts Rec. Turnover | 9.03 (9.12) | 10.33 (14.93) | 0.42 | 0.52 |
| Inventory Turnover | 28.71 (59.80) | 15.40 (20.93) | 3.36* | 0.07 |
| Fixed Assets Turnover | 10.90 (14.26) | 8.22 (13.62) | 1.41 | 0.24 |
| Total Assets Turnover | 1.01 (0.61) | 0.93 (0.46) | 0.91 | 0.34 |
| <i>Financial Leverage</i> | | | | |
| Total Debt Ratio | 43.6% (23.3%) | 44.0% (21.6%) | 0.01 | 0.92 |
| <i>Profitability</i> | | | | |
| Net Profit Margin | -1.9% (46.2%) | -3.8% (30.7%) | 1.02 | 0.31 |
| Operating Profit Margin | -0.5% (54.3%) | -3.8% (30.7%) | 1.11 | 0.29 |
| Return on Assets | 2.2% (13.5%) | -0.9% (19.9%) | 1.25 | 0.27 |
| Earning Power Ratio | 4.5% (14.5%) | 1.8% (19.0%) | 0.99 | 0.32 |
| Return on Equity | 4.8% (29.2%) | -4.8% (48.0%) | 2.24 | 0.14 |
| <i>Growth</i> | | | | |
| Cap. Expenditure Ratio | 4.3% (3.7%) | 4.9% (5.3%) | 0.70 | 0.41 |
| <i>Market Value</i> | | | | |
| Market-to-Book Ratio | 3.11 (2.68) | 3.37 (3.47) | 0.27 | 0.61 |
| Multivariate Statistics: | | | 0.75 | 0.73 |

† The figures in parentheses are the standard deviations.

***, **, * indicate that the difference is significant at the 1-percent, 5-percent, and 10-percent levels, respectively.

4.3 Post-Crisis Period

The MANOVA test statistics for the post-crisis period are presented in Table 6. The multivariate F statistic in the table indicates that, as in the previous two periods, the overall financial characteristics of the two groups of firms are not significantly different. However, the univariate F statistic shows that the capital expenditure ratio is significantly lower for the target firms than for the control group firms at the ten-percent level. It implies that the acquiring firms preferred targets with lower capital expenditure ratios during this period. These firms presumably had lower market valuations compared with growth firms with greater capital expenditure ratios making them less expensive targets.

Table 6. MANOVA Statistics for the Post-Crisis Period: Target Firms vs. Control Group Firms

| Financial Ratios | Means and Standard Deviations† | | Univariate Statistics | |
|---|--------------------------------|-------------------|-----------------------|---------|
| | Acquisition Targets | Control Group | F Value | P Value |
| <i>Liquidity</i> | | | | |
| Current Ratio | 2.81 (1.89) | 3.14 (2.57) | 1.27 | 0.26 |
| Quick Ratio | 2.21 (1.64) | 2.38 (2.02) | 0.52 | 0.47 |
| Liquid Assets Ratio | 0.22 (0.20) | 0.22 (0.21) | 0.03 | 0.86 |
| <i>Asset Management (Turnover) Ratios</i> | | | | |
| Accounts Rec. Turnover | 8.60 (9.58) | 9.17 (10.39) | 0.19 | 0.66 |
| Inventory Turnover | 26.42 (62.54) | 24.39 (50.71) | 0.07 | 0.79 |
| Fixed Assets Turnover | 10.81 (16.26) | 11.14 (17.55) | 0.02 | 0.88 |
| Total Assets Turnover | 0.93 (0.53) | 0.86 (0.46) | 0.98 | 0.32 |
| <i>Financial Leverage</i> | | | | |
| Total Debt Ratio | 45.1% (19.8%) | 43.7% (23.0%) | 0.25 | 0.62 |
| <i>Profitability</i> | | | | |
| Net Profit Margin | -8.2% (54.5%) | -7.4% (59.2%) | 0.01 | 0.92 |
| Operating Profit Margin | -1.1% (49.9%) | -1.5% (58.4%) | 0.00 | 0.96 |
| Return on Assets | -2.9% (14.3%) | -2.4% (18.3%) | 0.05 | 0.83 |
| Earning Power Ratio | 2.2% (10.9%) | 2.0% (15.9%) | 0.01 | 0.92 |
| Return on Equity | -6.8% (33.7%) | -12.5% (99.2%) | 0.35 | 0.56 |
| <i>Growth</i> | | | | |
| Cap. Expenditure Ratio | 3.8% (3.6%) | 4.8% (5.0%) | 3.24* | 0.07 |
| <i>Market Value</i> | | | | |
| Market-to-Book Ratio | 2.17 (1.75) | 2.24 (2.45) | 0.07 | 0.80 |
| Multivariate Statistics: | | | 0.75 | 0.73 |

† The figures in parentheses are the standard deviations.

***, **, * indicate that the difference is significant at the 1-percent, 5-percent, and 10-percent levels, respectively.

5. Summary and Conclusions

Mergers and acquisitions (M&A) are among the most popular research topics in finance. However, M&A activities during economic/financial crisis periods have been understudied. In this paper, we make a contribution on this subject by studying the financial characteristics of acquisition targets before, during, and after the October 9, 2007-March 9, 2009 bear market.

We find that acquiring firms preferred targets with higher total assets turnover ratios before the bear market, with higher inventory turnover ratios during the bear market, and with lower capital expenditure ratios after the bear market.

In the pre-crisis period, the total assets turnover ratio is significantly higher in the acquired target firms than in the non-acquired control group firms. It appears that acquiring firms saw greater profit and growth potential in targets that are able to achieve high total assets turnover rates during this relatively normal period before the bear market.

During the crisis period, the inventory turnover ratio is significantly lower in the acquired target firms than in the non-acquired control group firms. The acquiring firms appear to have avoided targets with a low inventory

turnover and excessive inventories during this period. The expectation on the part of the acquiring firms must have been that it would be extremely difficult to liquidate the inventories of the target in a bear market and recessionary economy.

In the post-crisis period, the capital expenditure ratio is significantly lower in the acquired target firms than in the non-acquired control group firms. A strong bull market followed the bear market for several months during the March-July, 2009 period. The market values of growth firms with high capital expenditure ratios increased sharply during this period. Our finding implies that the acquiring firms preferred targets with lower capital expenditure ratios (and with relatively lower market valuations) in the post-bear market period.

Our findings in this study can provide valuable insights to managers of potential acquiring and target firms with respect to what characteristics are considered to be important in acquisition targets during normal, crisis, and post-crisis periods. The information provided in this study may enable the managers of both acquiring and target firms to adopt the right strategies to earn the maximum benefit from mergers and acquisitions.

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