

The Measurement of Post-Acquisition Performance Using EVA

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This study reexamines post-acquisition performance of acquiring firms using EVA. Investigation of the largest 75 acquisitions occurring during 1989 to 1993 reveals that acquiring firms experience significantly deteriorating raw EVA after the completion of acquisitions. When industry-adjusted EVA is examined, however, the difference is almost indiscernible. These results indicate that the sharp decline in raw EVA is mostly accounted for by industry effects. If EVA is calculated assuming that no premium was paid to target firms, i.e., the premium is excluded from the acquiring firm's capital in the post-acquisition period, industry-adjusted EVA shows an insignificant improvement. These results suggest that acquiring firms tend to experience slightly improved performance relative to their industry counterparts after completion of the acquisition. But the improved operating performance is wiped out by capital costs of the large premiums paid to the target firm, creating no real economic gains to the acquiring firm's shareholders.

Introduction

Despite overwhelming evidence of share price gains to target shareholders, most acquiring firms fail to realize positive gains. A number of studies find that shareholders of acquiring firms earn, on average, zero abnormal return at the time of announcement, though there is enormous variation in these return (Fuller, Netter, and Stegemoller, 2002). A recent strand of business press reports that a majority of acquiring firms in the 1990s experienced a sharp decline in stock price at a merger announcement. Although acquiring firms are not winners, however, all studies agree that acquisitions on average increase the combined equity value of the target and acquiring firms, suggesting that acquisitions create shareholder value. The positive overall wealth gains are attributed to the financial market's anticipation of post-acquisition improved performance.

The evidence of improvement in the post-acquisition firm's performance is not conclusive. There are two general approaches employed in the existing literature to measure the long-term performance. The first group of studies examine acquiring firms' stock returns over the three to five years following the acquisition completion.

In an efficient stock market in which share price gains at the time of announcements represent any expected post-acquisition performance improvement, post-acquisition share price performance should not be different from the benchmark return. Early studies find a long-term negative move in acquiring firm stock prices (Magenheim and Mueller, 1988; Loderer and Martin, 1992; Agrawal, Jaffe, and Mandelker, 1992). Mitchell and Stafford (2000) and Franks, Harris, and Titman (1991), however, attribute negative post-acquisition performance to estimation bias. There are a number of methodological concerns with long-term event studies. [See Andrade, Mitchell, and Stafford (2001) for a summary of the concerns.] Addressing the statistical reliability of long-term event studies, Mitchell and Stafford (2000) calculate three-year statistically significant abnormal returns of -5 percent for equal-weight portfolio and statistically insignificant -1.4 percent for value-weight portfolio. In addition, a few recent studies report significant cross-sectional variations depending on the type of acquisition (merger versus tender offer), the method of payment (cash versus stock), and the book-to-market equity ratio of acquiring firms (“value” firms versus “growth” firm). Acquiring firms earn higher abnormal returns in tender offers than mergers (Loughran and Vijh, 1997) and cash acquisitions than stock acquisitions (Loughran and Vijh, 1997; Rau and Vermaelen, 1998; Mitchell and Stafford, 2000). Acquiring firms identified as low book-to-market (growth firms) earn higher abnormal returns than firms identified as high book-to-market (value firms) (Rau and Vermaelen, 1998; Mitchell and Stafford, 2000).

The second approach directly assesses the acquiring firm’s operating performance using financial and accounting data. The advantage of this approach is to measure the actual economic benefit of acquisition on the firm’s performance. If acquisitions do truly create shareholder value, the firm’s operating performance should eventually reflect the economic gains. Studies using accounting data offer mixed results. According to Fowler and Schmidt (1988) and Ravenscraft and Scherer (1987), acquiring firms’ accounting rate of returns and profitability after acquisitions either deteriorate or show little improvement. Healy, Palepu, and Ruback (1992, 1997), however, report that the industry-adjusted cash flow returns after takeover vary depending upon whether the premium paid to target firms is taken into account in the analysis. If the cash flow returns are calculated assuming no premium was paid to target companies (i.e., the premium is excluded in the asset base), the median is 2.8 percent, indicating that takeovers improve profitability. If this adjustment is not made, the return becomes insignificant. Healy, Palepu, and Ruback interpret these findings as evidence that acquisitions were zero net present value investments for acquiring firms. Cornett and Tehranian (1992) find that a sample of 30 mergers in the banking industry are associated with improved operating performance.

A New Performance Measure

Accounting rate of returns and profitability measures, however, are criticized for their deficiencies in guiding shareholder wealth maximization. Ignoring the cost of capital, these measures lack a formal mechanism for determining whether achieving such goals creates value for shareholders. Although a firm earns a positive net income and high accounting rate of return, it may reduce shareholder wealth because earnings fall short of the required rate of returns that shareholders could earn by investing in other securities of comparable risk. In addition, the accounting measures may possibly be manipulated. It is well-known that companies can use creative accounting techniques that may imply that their published accounts may not be a true and fair reflection of the companies' financial position, as in the well-publicized Enron case.

These problems are particularly severe in measuring surviving acquiring firms' operating performance. Post-Acquisition accounting income can be distorted by the choice of financing, the accounting method (i.e., purchase versus pooling), and other accounting treatments. In general, cash payment financed by debt and purchase accounting lower post-acquisition accounting earnings.

As an alternative measure that can overcome these deficiencies, economic value added (EVA), which is closely related to the net present value concept, has received growing attention in recent years in both business and academics. EVA is an estimate of a business's true economic profit for the year, and it differs sharply from accounting profit. EVA is essentially the residual income that remains after all costs have been recognized, including the opportunity cost of the equity capital employed. Accounting net income is overstated in an economic sense because the cost of equity capital is not deducted when net income is calculated. EVA overcomes this flaw in conventional accounting to measure a firm's true operating performance.

As the value of a company depends on the extent to which future cash flows exceed the cost of capital, theoretically EVA is the performance measure directly linked to the creation of shareholder wealth. EVA takes into account riskiness of investment which is factored into the cost of equity capital. Stewart (1994) argues that the use of EVA as the financial performance measure links all decision making with a common focus: how to maximize shareholder wealth.

The Purpose of This Study

This study reexamines pre- and post-acquisition performance of target and acquiring firms using EVA. The purpose of this study is three-fold. First, the impact of acquisition on the acquiring firm's financial performance is assessed by comparing pre- and post-acquisition EVA relative to the industry average. Industry-adjusted EVA is measured in each of five years prior to the acquisition and, where available, up to as much as five years after the acquisition. Many earlier studies find considerable variation in the acquiring firms' performance (regardless of whether measured

in stock returns or accounting returns) across the transaction characteristics that include (1) types of acquisition (mergers or tender offers), (2) method of payment (cash or stock), and (3) business similarity between the acquiring firm and the target firm. Therefore, the second goal of this study is to examine cross-sectional variation in EVA performance according to the transaction characteristics. Third, this study investigates whether the size of premiums paid to target firms is related to the subsequent EVA during the post-acquisition period. Premiums are important not only because they are likely to represent acquiring firms' expected synergies but because they affect ultimate acquisition performance, as Healy, Palepu, and Ruback (1992) state. The higher the premium paid, the lower the ultimate return to the acquiring firm from a given acquisition is expected.

Sample and Data

Sample firms are selected by searching the CRSP tapes for all NYSE, AMEX, and Nasdaq delistings caused by acquisition during the period 1989-1994. The *Wall Street Journal*, related articles in *Nexus-Lexus*, and the *Capital Adjustment Register* are used to confirm the delistings and identify the acquiring firm's name and other characteristics. All target firms whose asset size is less than \$100 million are excluded. Target firm size is measured by market value of equity plus long-term debt and short-term debt, less cash and marketable securities at the last fiscal year prior to the acquisition. Healy, Palepu, and Ruback (1997) argue that advantages of using a sample of large acquisitions over a random sample include (1) the dollar value of the selected takeovers accounted for a significant portion of the dollar value of all takeovers; (2) if acquiring companies did gain economically from takeovers, the gains would most likely be detected if the target firm were large; (3) it was unlikely that the sample acquirers would undertake equally large acquisitions prior or subsequent to the takeover, reducing any confusion in interpreting results.

Additional criteria include (1) both acquiring and target firms are included in Compustat; (2) acquiring firms did not engage in another major acquisition during a five-year period;¹ (3) the acquiring firm is a non-financial and non-regulated U.S. company. Application of these data requirements results in a final sample of 75 acquisitions.

Each firm's annual EVA is estimated using the method suggested by Yook (2000). For industry average EVA, the Stern Stewart Performance 1000 database is used. The Stern Stewart Performance 1000 presents a financial analysis of 1000 large companies as well as 56 industry groups: Data on EVA, market value, total capital invested, net operating profit after taxes (NOPAT), and cost of capital are included in the database.

¹Major acquisitions are defined as ones with target firms whose asset size is greater than \$100 million.

The event date is taken as the date of the first announcement in the *Wall Street Journal*. The method of payment is obtained from the *Capital Adjustments Register*. The mode of acquisition (merger or tender offer) is identified following guidelines suggested by Loughran and Vijh (1997).² Business similarity between the acquiring and target firms is classified as high or low by evaluating each firm's businesses reported in their annual reports and *Moody's Industrial Manuals*.

Sample Characteristics

The average value of target firms is \$827 million. The smallest value is \$103 million and the largest one is \$9.6 billion. The premium paid to target firms based on the target firm's stock price 30 days before the public announcement of the deal ranges from -\$40 million to \$4.8 billion. The average premium is \$135 million, which is almost 20% of the target value. The average value of bidding firms is \$4.5 billion, ranging from \$1.2 billion to \$12.3 billion.

The sample consists of 56 mergers and 19 tender offers; 42 acquisitions involved cash payment, 27 involved stock payment, and 6 involved mixed offers of cash, stock, and other securities. Regarding business similarity, 52 acquisitions are classified as having high similarity and 23 as low similarity. The acquiring firms come from 34 industries, while the target firms come from 30 industries.

The variables may not be independent. The business similarity and the form of payment are partly endogenous to the mode of acquisition. Sixty percent of the mergers are stock transactions, 26 percent are financed by cash, and the remaining 14 percent are financed by combinations of cash, stock, and other securities. Consistent with other studies, tender offers are predominantly cash financed. The Pearson correlation coefficients among the three variables, i.e., mode of acquisition, method of payment, and business similarity, were calculated. The method of payment and the mode of acquisition are highly correlated, with an average correlation coefficient of 0.47, whereas the other variables are not significantly correlated. The sample in this study does not support an existing notion that mergers are a common mode in overlapping businesses whereas tender offers are more often for firms in unrelated businesses.

Estimation of Industry-adjusted EVA

Industry-adjusted EVA is measured by comparing both acquiring and target firms with other firms that operate in the same industry. Factors that may influence

²An acquisition is classified as a merger if some of the following characteristics were present at the time of acquisition: the tone was friendly, the target's managers were favorable, and the board of directors and the shareholders voted and approved the deal. An acquisition is classified as a tender offer if some of the following characteristics were present: the tone was aggressive, there was no shareholder meeting or approval, the word tender was used, a percentage of shares sought was mentioned (Loughran and Vijh, 1997).

post-acquisition performance other than the acquisition itself include industry and business cycle. To control these effects, each individual firm's industry-adjusted EVA was estimated as follows:

$$\text{Industry-adjusted EVA}_{i,t} = \text{EVA}_{i,t} - (\text{Industry EVA}_t \div \text{Industry Capital}_{t-1}) * \text{Capital}_{i,t-1}$$

where $\text{EVA}_{i,t}$ is a firm i 's EVA in year t ; $\text{Capital}_{i,t-1}$ is a firm i 's capital at the end of year $t-1$; Industry EVA_t is the industry average EVA in year t and $\text{Industry Capital}_{t-1}$ is the industry average capital at the end of year $t-1$. Industry average EVA and Capital were collected from the Stern Stewart Performance 1000 database.

$(\text{Industry EVA}_t \div \text{Industry Capital}_{t-1})$ indicates the average EVA created per dollar of capital in the particular industry during the year t . Therefore, $(\text{Industry EVA}_t \div \text{Industry Capital}_{t-1}) * \text{Capital}_{i,t-1}$ represents the industry's average EVA for the same size firm.

Empirical Results

Panels A and B in Table 1 present the level of EVA for the period spanning by five years before (years -5 to -1) through the five years after (years 1 to 5) completion of the acquisition. The final line in each panel is the aggregate median for the associated five-year period.³ EVA is measured in two ways, raw EVA (EVA before accounting for industry effects) and industry-adjusted EVA. To obtain the pro forma pre-acquisition performance of the combined firms, the bidding and target firms' pre-acquisition EVAs are combined. Post-Acquisition EVA is that of the surviving acquiring firm. Inspection of the results presented in Panel B indicates that raw EVA apparently declines substantially after completion of the acquisition. The aggregate median EVA during the five years before the acquisition is -\$3 million, but it drops to -\$16 million in year 1, -\$19 million in year 2, -\$31 million in year 3, -\$21 million in year 4, and -\$33 million in year 5. The aggregate median EVA in the post-acquisition five years is -\$27 million. These results exhibit a considerable deterioration in operating performance for each of the five years examined.⁴

When the industry-adjusted EVA is examined, however, the downward pattern is substantially weakened. The aggregate median EVA during the five years preceding the acquisition is \$6 million. It does not change much for the first two years after the acquisition, \$8 million in year 1 and \$5 million in year 2. After year 2, it shows a

³To calculate the aggregate pre-acquisition median EVAs, this study first computes the median EVA for each firm for years -5 to -1, following Healy, Palepu, and Ruback (1992). The aggregate EVA is the median of these values. The aggregate post-acquisition EVAs are calculated the same way.

⁴Sample size in each year changes due to data availability in Compustat. All sample firms were included in Compustat at the time of acquisition. Because some firms were recently added to Compustat before the acquisition and some firms were deleted after the acquisition from Compustat, however, the number of firms declines as we move away from the year 0.

little volatility, -\$10 million in year 3, \$12 million in year 4, and -\$10 million in year 5. The five-year aggregate EVA is \$3 million.

Because the sample size is small, the Wilcoxon rank sum test is applied to determine whether the differences between the aggregate median EVA during the five years preceding the acquisition and each of the five years following the acquisition are statistically significant. Panel C in Table 1 shows the results. When raw EVA is used, the difference is significant for the first three years with the significance level of 0.05 for years 1 and 2, and 0.10 for year 3, but it is not significant in years 4 and 5. The difference between the aggregate median EVA for the pre-acquisition five-year period and the corresponding EVA during the post-acquisition five-year period is significant at the 0.10 level. These results suggest that overall operating performance significantly deteriorates after acquisition.

Table 1—Raw and Industry-Adjusted Median EVA for the Acquiring Firms

All EVAs are in million dollars. Industry-adjusted EVA is computed as $EVA_{i,t} - (Industry\ EVA_t \div Industry\ Capital_{i,t}) * Capital_{i,t}$ where $EVA_{i,t}$ is a firm i 's EVA in year t ; $Capital_{i,t}$ is a firm i 's capital at the end of year $t-1$; $Industry\ EVA_t$ is the industry average EVA in year t and $Industry\ Capital_{t-1}$ is the industry average capital at the end of year $t-1$. Pre-acquisition EVAs are sums of the acquiring and target firms. Panel C presents the difference between the aggregate five-year median EVA before the acquisition and each of five-year median EVAs after the acquisition. The Wilcoxon rank sum test is applied to determine whether the difference is significant

Year Relative to Completion	N	Raw EVA	Industry-adjusted EVA
Panel A: Pre-Acquisition Performance			
-5	26	-7	-1
-4	45	5	7
-3	63	-4	1
-2	72	-2	12
-1	75	-7	10
Median from -5 to -1	75	-3	6
Panel B: Post-Acquisition Performance			
1	75	-16	8
2	74	-19	5
3	68	-31	-10
4	53	-21	12
5	32	-33	-10
Median from 1 to 5	75	-27	3
Panel C: Difference Between Pre-Acquisition EVA and Post-Acquisition EVA			
From (-5, -1) to 1	75	-11**	1
From (-5, -1) to 2	73	-9**	0
From (-5, -1) to 3	67	-25*	-13*
From (-5, -1) to 4	52	-10	-6
From (-5, -1) to 5	32	-10	-18
From (-5, -1) to (1, 5)	75	-15*	-3

** and * denote significance at the 0.05 and 0.10 levels, respectively, based on a two-tailed test

When industry-adjusted EVA is examined, however, the difference is significant only in year 3 at the 0.10 significance level. Any significant difference in the median industry-adjusted EVA is not detected in other years. In sum, the acquiring firm experiences considerably deteriorating operating performance after acquisition, but the poor performance is generally not different from their industry counterparts. These findings imply that the sharp decline in raw EVA in the post-acquisition period is mostly accounted for by industry effects. This implication might support the view that industries experiencing relatively poor operating performance are likely to be the object of takeover activity. Finding that acquisitions strongly cluster by industry, Mitchell and Mulherin (1996) argue that acquisitions might occur as a reaction to unexpected shocks to industry structure. A change in economic conditions associated with regulatory or technological shocks might necessitate restructuring activities. Acquisition can restore efficiency through consolidation in industries that are plagued by low investment opportunities, excess capacity, deteriorating cash flows, and increasing capital costs.

EVA can be calculated differently, by excluding the premiums paid to the target firm from the acquiring firm's capital in the post-acquisition period. If the premium is included in the total capital, the post-acquisition EVA does not accurately reflect any improvement in operating performance. As acquiring firms typically pay large premiums, EVA is likely to be underestimated due to the additional capital costs incurred by the premiums paid to the target firm. By excluding the premiums, we can isolate the effect of acquisition and measure whether operating performance is improved after the acquisition compared to the pre-acquisition period.

Table 2 presents raw EVA and industry-adjusted EVA that are calculated by excluding the premiums paid to the target firms from the acquiring firm's capital in the post-acquisition period. Panel A is the same as Panel A in Table 1. Post-Acquisition EVAs reported in Panel B show that raw EVAs subsequent to the acquisition decline, but the magnitude is approximately \$10 million less than Table 1 where the premium is not deducted from total capital. Difference in aggregate EVA between pre-acquisition and post-acquisition periods is -\$7 million, which is not statistically significant.

In contrast, industry-adjusted EVAs show a weak improvement. The aggregate median post-acquisition EVA is \$4 million more than the pre-acquisition EVA. These results suggest that acquiring firms tend to experience slightly improved performance relative to their industry counterparts after completion of the acquisition, although it is not statistically significant. But the improved operating performance is wiped out by capital costs of the large premiums paid to the target firm, creating no real economic gains to the acquiring firm's shareholders.

Table 2—Raw and Industry-Adjusted Median EVA for the Acquiring Firms when the Premium Paid to the Target Firm is Excluded from the Acquiring Firm's Capital in the Post-Acquisition Period

All EVAs are in million dollars. Industry-adjusted EVA is computed as $EVA_{i,t} - (Industry\ EVA_t \div Industry\ Capital_{i,t}) * Capital_{i,t}$ where $EVA_{i,t}$ is a firm i 's EVA in year t ; $Capital_{i,t}$ is a firm i 's capital at the end of year $t-1$; $Industry\ EVA_t$ is the industry average EVA in year t and $Industry\ Capital_{i,t}$ is the industry average capital at the end of year $t-1$. Pre-acquisition EVAs are sums of the acquiring and target firms' EVAs. Panel C presents the difference between the aggregate five-year median EVA before the acquisition and each of five-year median EVAs after the acquisition. The Wilcoxon rank sum test is applied to determine whether the difference is significant

Year Relative to Completion	N	Raw EVA	Industry-Adjusted EVA
Panel A: Pre-Acquisition Performance			
-5	26	-7	-1
-4	45	5	7
-3	63	-4	1
-2	72	-2	12
-1	75	-7	10
Median from -5 to -1	75	-3	6
Panel B: Post-Acquisition Performance			
1	75	-8	11
2	74	-11	11
3	68	-22	-2
4	53	-17	17
5	32	-27	-1
Median from 1 to 5	75	-16	8
Panel C: Difference between Pre-Acquisition EVA and Post-Acquisition EVA			
From (-5, -1) to 1	75	-1	5
From (-5, -1) to 2	73	-8	4
From (-5, -1) to 3	67	-9	-5
From (-5, -1) to 4	52	-7	6
From (-5, -1) to 5	32	-7	-6
From (-5, -1) to (1, 5)	75	-7	4

Next this study examines whether post-acquisition performance differs across transaction characteristics that include (1) types of acquisition (mergers or tender offers), (2) method of payment (cash or stock), (3) business similarity between the acquiring firm and the target firm, and (4) premiums paid to the target firm.

Mergers versus Tender Offers

Mode of acquisition may be related to expected wealth gains resulting from operating synergies and the disciplining of target managers. Mergers are usually friendly negotiated deals that reach a mutually agreeable decision. Tender offers are made directly to target shareholders to tender their shares at specified prices. Tender offers are often hostile in the sense that bidding firms should overcome resistance from incumbent managers. In this context, as Loughran and Vijh (1997) note, tender offers may indicate greater confidence in the acquiring firm's ability to realize efficiency gains from the acquisition. In addition, acquiring firms may want to obtain

control of target firms' assets to replace inefficient management or to force incumbent management to take up efficient policies (Morck, Shleifer, and Vishny, 1988; Martin and McConnell, 1991). As this type of acquisition is likely to be resisted, tender offers may create more wealth than mergers because of the tender offer's role in disciplining target management. The spread between the target's current market value depressed by inefficient management and its intrinsic value represents the potential profit to the acquiring firm.

Table 3 presents five-year post-acquisition EVAs classified by mode of acquisition. Panel A displays post-acquisition raw EVA and industry-adjusted EVA. Panel B displays changes in EVA from the pre-acquisition period. All these EVAs are calculated after adjusting premiums paid to the target firm (i.e., excluding the premiums from the acquiring firm's capital). When raw EVA is examined, there is virtually no difference between mergers and tender offers. When industry-adjusted EVA is examined, as the theories predict, tender offers consistently earn larger EVAs than do mergers throughout the years. The aggregate median industry-adjusted EVAs in the post-acquisition five years is \$1 million for mergers and \$15 million for tender offers. The Z-value of the difference is 1.57, with a significance level of a little higher than 0.10. Although the difference between EVAs is statistically significant at the 0.10 level only in year 1, the pattern of consistently higher EVA for tender offers than mergers in all years leads us to conclude that tender offers create more wealth than do mergers.

When EVA is calculated without adjusting premiums paid to the target firm, however, the difference in EVA between mergers and tender offers disappears (not reported here). Considering tender offers pay larger premiums than do mergers (\$278 million versus \$84 million in this study's sample), the additional premium is justified by the higher improvement in operating performance. These findings indicate that both types of acquisitions result in the same post-acquisition performance if the premium difference is taken into account.

Payment Method

Method of payment may also be related to an acquiring firm's post-acquisition performance. Three arguments predict a better performance for cash financed acquisitions. First, the method of payment may convey managers' private information about their stock price. In a world where managers possess private information that shareholders do not, acquiring firms' bidders are expected to pay cash (stock), if they feel their assessment of the value of the acquisition is higher (lower) than what the market will assess when the acquisition is announced. Second, the free cash flow theory posits the benefits of debt in reducing agency problems, and in monitoring managers' efficiency. Third, Erickson and Wang (1999) argue that stock-offering bidding firms manage their earnings aggressively, utilizing discretionary accruals to inflate their stock prices prior to acquisitions. All these arguments predict a decline

Table 3—Post-Acquisition Raw and Industry-Adjusted Median EVA Classified by the Mode of Acquisition

All EVAs are in million dollars. Industry-adjusted EVA is computed as $EVA_{i,t} - (Industry\ EVA_t \div Industry\ Capital_{t-1}) * Capital_{i,t-1}$ where $EVA_{i,t}$ is a firm i 's EVA in year t ; $Capital_{i,t-1}$ is a firm i 's capital at the end of year $t-1$; $Industry\ EVA_t$ is the industry average EVA in year t and $Industry\ Capital_{t-1}$ is the industry average capital at the end of year $t-1$. Pre-acquisition EVAs are sums of the acquiring and target firms' EVAs. Panel C presents the difference between the aggregate five-year median EVA before the acquisition and each of five-year median EVAs after the acquisition. The Wilcoxon rank sum test is applied to determine whether the difference is significant

Panel A: Post-Acquisition EVA

Year Relative to Acquisition	Raw EVA			Industry-Adjusted EVA		
	Merger	Tender Offer	Difference Z value	Merger	Tender Offer	Difference Z value
1	-8	-20	-0.57	6	26	1.66*
2	-6	-13	-0.98	6	16	1.41
3	-16	-30	-0.56	-4	-1	0.69
4	-29	-9	0.20	-2	27	1.58
5	-20	-29	0.10	-18	-7	1.27
Median from 1 to 5	-9	-17	-0.49	1	15	1.57

Panel B: Difference between Pre-Acquisition EVA and Post-Acquisition EVA

Year Relative to Acquisition	Raw EVA			Industry-Adjusted EVA		
	Merger	Tender Offer	Difference Z value	Merger	Tender Offer	Difference Z value
From (-5, -1) to 1	-6	-2	0.50	4	15	1.68*
From (-5, -1) to 2	-3	-9	-0.31	0	12	1.51
From (-5, -1) to 3	-8	-25	-0.29	-18	-7	1.04
From (-5, -1) to 4	-18	0	0.90	-12	12	0.98
From (-5, -1) to 5	-2	-23	-0.55	-28	-19	0.99
From (-5, -1) to (1, 5)	-7	-12	-0.32	-4	5	1.37

* denotes significance at the 0.10 level based on a two-tailed test

in the operating performance of acquiring firms subsequent to their acquisitions. Therefore, EVA after acquisition will be lower for equity-financed transactions.

Studies of the relation between post-acquisition stock returns and the method of payment offer mixed results. Loughran and Vijh (1997), and Agrawal, Jafee, and Mandelker (1992) report that cash bidders outperform stock bidders. Healey, Palepu, and Ruback (1992) find no relation between changes in operating performance and the method of payment: the operating performance improves by similar magnitude subsequent to both cash and stock acquisitions.

Table 4 reports five-year post-acquisition EVAs classified by method of payment. Regardless of whether raw EVA or industry-adjusted EVA is examined, there is no difference between these two types of financing. Aggregate median raw EVAs are -\$15 million for stock acquisitions and -\$14 million for cash acquisitions. Industry-adjusted EVAs are \$2 million and \$9 million, respectively. In Panel B where changes in EVA from the pre-acquisition period are presented, cash acquisitions experience decreased EVA whereas stock acquisitions experience increased EVA. Overall, the evidence appears to provide no support for the hypothesis that cash-

financed acquisitions create more economic gains than do stock acquisitions for acquiring firms.

Table 4—Post-Acquisition Raw and Industry-Adjusted Median EVA Classified by the Method of Payment

All EVAs are in million dollars. Industry-adjusted EVA is computed as $EVA_{i,t} - (Industry\ EVA_t \div Industry\ Capital_{i,t}) * Capital_{i,t}$ where $EVA_{i,t}$ is a firm i 's EVA in year t ; $Capital_{i,t}$ is a firm i 's capital at the end of year $t-1$; $Industry\ EVA_t$ is the industry average EVA in year t and $Industry\ Capital_{i,t}$ is the industry average capital at the end of year $t-1$. Pre-acquisition EVAs are sums of the acquiring and target firms' EVAs. Panel C presents the difference between the aggregate five-year median EVA before the acquisition and each of five-year median EVAs after the acquisition. The Wilcoxon rank sum test is applied to determine whether the difference is significant

Panel A: Post-Acquisition EVA

Year Relative to Acquisition	Raw EVA			Industry-Adjusted EVA		
	Stock	Cash	Difference Z value	Stock	Cash	Difference Z value
1	-8	-10	0.30	6	14	0.76
2	-2	-14	-0.82	8	12	0.76
3	-19	-24	-0.03	-4	3	0.57
4	-29	-13	-0.64	11	17	-0.24
5	-14	-30	0.08	0	-31	0.53
Median from 1 to 5	-15	-14	-0.30	2	9	0.78

Panel B: Difference between Pre-Acquisition EVA and Post-Acquisition EVA

Year Relative to Acquisition	Raw EVA			Industry-Adjusted EVA		
	Stock	Cash	Difference Z value	Stock	Cash	Difference Z value
From (-5, -1) to 1	-9	-4	-0.08	5	10	0.04
From (-5, -1) to 2	4	-14	-1.42	5	7	-0.11
From (-5, -1) to 3	0	-26	-1.59	-10	-11	-0.47
From (-5, -1) to 4	-16	-3	-0.05	13	-5	0.70
From (-5, -1) to 5	0	-22	0.43	-7	-31	0.90
From (-5, -1) to (1, 5)	4	-15	-1.18	5	-2	-0.70

Business Similarity

The logic of operating synergy theory indicates that commonalities or complementarities between the acquiring and target firms are likely to offer more opportunities for synergistic gains. Accordingly, acquisitions between firms that exhibit some potential for relatedness are expected to have higher EVA. Healey, Palepu, and Ruback (1992) find operating improvements are strong for acquisitions involving firms in overlapping businesses.

Results presented in Table 5 provide weak support for this prediction. When raw EVA is examined, acquisitions with a high degree of business similarity experience higher EVA. The aggregate median raw EVA after acquisition for highly overlapping acquisitions is -\$9 million, whereas corresponding EVA for low overlapping acquisition is -\$24 million. The difference apparently increases as time passes: It is only \$2 million in year 1, but increases to \$3 million in year 2, \$14 million in year 3,

\$33 million in year 4, and \$58 million in year 5. The same pattern occurs in industry-adjusted EVA, although the magnitude is much weaker. The aggregate median industry-adjusted EVAs are -\$1 million and \$5 million for low overlapping and highly overlapping businesses, respectively. The difference is statistically significant only in year 5 when raw EVA is used.

Table 5—Post-Acquisition Raw and Industry-Adjusted Median EVA Classified by Business Similarity

All EVAs are in million dollars. Industry-adjusted EVA is computed as $EVA_{i,t} - (Industry\ EVA_t \div Industry\ Capital_{i,t}) * Capital_{i,t}$ where $EVA_{i,t}$ is a firm i 's EVA in year t ; $Capital_{i,t}$ is a firm i 's capital at the end of year $t-1$; $Industry\ EVA_t$ is the industry average EVA in year t and $Industry\ Capital_{t-1}$ is the industry average capital at the end of year $t-1$. Pre-acquisition EVAs are sums of the acquiring and target firms' EVAs. Panel C presents the difference between the aggregate five-year median EVA before the acquisition and each of five-year median EVAs after the acquisition. The Wilcoxon rank sum test is applied to determine whether the difference is significant

Panel A: Post-Acquisition EVA

Year Relative to Acquisition	Raw EVA			Industry-Adjusted EVA		
	Low	High	Difference Z value	Low	High	Difference Z value
1	-7	-9	0.07	6	14	0.11
2	-8	-11	0.29	12	6	1.29
3	-34	-20	-0.63	-17	3	-0.76
4	-33	0	-1.52	-10	26	-0.93
5	-59	-1	-1.69*	-41	0	-0.37
Median from 1 to 5	-24	-9	-1.48	-1	5	-0.22

Panel B: Difference between Pre-Acquisition EVA and Post-Acquisition EVA

Year Relative to Acquisition	Raw EVA			Industry-Adjusted EVA		
	Low	High	Difference Z value	Low	High	Difference Z value
From (-5, -1) to 1	-5	-13	0.46	13	1	0.26
From (-5, -1) to 2	-4	-4	0.23	14	-2	0.47
From (-5, -1) to 3	-8	-14	-0.24	-11	-10	0.61
From (-5, -1) to 4	-23	-5	-0.99	4	-4	-0.27
From (-5, -1) to 5	-56	5	-1.70*	-44	-14	-0.33
From (-5, -1) to (1, 5)	-17	-7	-0.61	4	-1	0.97

* denotes significance at the 0.10 level based on a two-tailed test

Overall, these results indicate that acquisitions involving firms in overlapping businesses experience operating improvements as time passes. This improvement disappears when industry effect taken into account. One possible explanation for this phenomenon is that if industries experiencing relatively poor operating performance are likely to be the object of takeover activity, restoration of efficiency and operating improvements through consolidation in industries benefit other firms in the same industry. Therefore, we fail to observe a distinct improvement in industry-adjusted EVA for acquiring firms.

Table 6—Post-Acquisition Raw and Industry-Adjusted Median EVA Classified by the Amount of Premium Paid to the Target

All EVAs are in million dollars. Industry-adjusted EVA is computed as $EVA_{i,t} - (Industry\ EVA_t \div Industry\ Capital_{t-1}) * Capital_{i,t-1}$ where $EVA_{i,t}$ is a firm i 's EVA in year t ; $Capital_{i,t-1}$ is a firm i 's capital at the end of year $t-1$; $Industry\ EVA_t$ is the industry average EVA in year t and $Industry\ Capital_{t-1}$ is the industry average capital at the end of year $t-1$. Pre-acquisition EVAs are sums of the acquiring and target firms' EVAs. Panel C presents the difference between the aggregate five-year median EVA before the acquisition and each of five-year median EVAs after the acquisition. The Wilcoxon rank sum test is applied to determine whether the difference is significant

Panel A: Post-Acquisition EVA

Year Relative to Acquisition	Raw EVA			Industry-Adjusted EVA		
	Low	High	Difference Z value	Low	High	Difference Z value
1	-22	-3	2.32**	10	14	0.81
2	-18	-5	1.04	3	14	1.15
3	-22	-17	0.53	-13	7	0.30
4	-33	-8	0.98	7	28	0.10
5	-47	-2	1.46	-36	0	0.27
Median from 1 to 5	-27	-2	1.60*	-3	7	1.13

Panel B: Difference between Pre-Acquisition EVA and Post-Acquisition EVA

Year Relative to Acquisition	Raw EVA			Industry-Adjusted EVA		
	Low	High	Difference Z value	Low	High	Difference Z value
From (-5, -1) to 1	-16	1	1.60*	2	11	1.10
From (-5, -1) to 2	-11	2	0.77	1	5	0.78
From (-5, -1) to 3	-4	-23	-0.32	-15	-5	0.48
From (-5, -1) to 4	-3	-17	-0.27	-7	5	0.20
From (-5, -1) to 5	-19	0	0.77	-32	-11	0.40
From (-5, -1) to (1, 5)	-16	5	0.66	-2	5	0.90

** and * denote significance at the 0.05 and 0.10 levels, respectively, based on a two-tailed test

Premiums Paid

Another interesting issue in acquisitions is whether the amount of premiums paid to the target firm by the acquiring firm is a good predictor of subsequent performance. If the buyer determines the premium based on the expected synergistic gains, the premium will be recovered in the improved post-acquisition performance of the acquiring firm. To investigate this hypothesis, the sample is divided into a low premium group and a high premium group, based on the ratio of premiums divided by the target firm's total assets. Low premium firms are those with a ratio equal to or below the median of the entire sample, while high premium firms are those with a ratio above the median of the entire sample. The median ratio is 0.17 in this sample.

Results reported in Table 6 offer mixed support for this view. Like business similarity, the difference is statistically significant only with raw EVA. The aggregate median raw EVA for high premium acquisitions is -\$27 million, whereas corresponding EVA for low premium acquisition is -\$2 million. The difference is significant at the 0.10 level. When industry-adjusted EVAs are examined, the pre-

mium group consistently shows a better performance, but the difference is not quite statistically significant. The aggregate median industry-adjusted EVAs are -\$3 million and \$7 million for the low premium group and the high premium group, respectively.

These EVAs are estimated excluding the premium paid to the target from the acquiring firm's capital. When EVA is calculated without adjusting premiums paid to the target firm, the high premium group earns on average larger EVA in all years than the low premium group, but the difference is not significant (not reported here).

Summary

This study reexamines post-acquisition performance of acquiring firms using EVA. Whereas examining long-term stock returns has been a popularly used approach, the use of accounting and financial data is appropriate to measure directly post-acquisition operating performance gains. Traditional accounting rate of returns and profitability measures are criticized for their deficiencies in measuring performance, particularly because they ignore capital costs and have the potential for manipulation of accounting data. A new performance measure, EVA, overcomes these flaws existing in conventional financial metrics as a true performance measure.

After examining 75 large acquisitions occurring during 1989 to 1993, this study finds that acquiring firms experience significantly deteriorating operating performance after the completion of acquisitions. When EVA before adjusting industry effect is examined, the five-year aggregate median EVA following the acquisition is -\$27 million, whereas the five-year aggregate median EVA before the acquisition is -\$3 million. When industry-adjusted EVA is examined, however, the difference becomes much smaller. The aggregate median EVAs are \$6 million for the pre-acquisition period and \$3 million for the post-acquisition period. These results indicate that the sharp decline in raw EVA is mostly accounted for by industry effects, which reinforces the view that industries experiencing relatively poor operating performance are likely to be the object of takeover activity.

A different picture unfolds if premiums paid to target firms are taken into account in the analysis. If EVA is calculated assuming that no premium was paid to target firms, i.e., the premium is excluded from the acquiring firm's capital in the post-acquisition period, industry-adjusted EVA shows a slight improvement. The post-acquisition aggregate median EVA for this sample increased \$5 million compared to the pre-acquisition period. These results suggest that acquiring firms tend to experience slightly improved performance relative to their industry counterparts after completion of the acquisition. But the improved operating performance is negated by the capital costs of the large premiums paid to the target firm, creating no real economic gains to the acquiring firm's shareholders. These findings indicate that acquisitions are zero net present value investments for acquiring firms.

In addition, this study examines whether post-acquisition performance differs across the transaction characteristics that include type of acquisition (mergers or tender offers), method of payment (cash or stock), business similarity between the acquiring firm and the target firm, and premiums paid to target firms. Among these four characteristics, the mergers/tender offers variable is statistically significant. When industry-adjusted EVA (calculated assuming that no premium is paid to target firms) is examined, as the theories predict, tender offers consistently earn larger EVAs than do mergers throughout the years. The difference in EVA between mergers and tender offers disappear, however, if EVA is calculated without adjusting the premiums. These findings indicate that larger premiums paid in tender offers can be justified by the higher improvement in operating performance later.

In contrast to the theories that predict more takeover gains for cash acquisitions than for stock acquisitions, for highly overlapping business than for low overlapping business, and for high premium acquisitions than for low premium acquisitions, the current study fails to find any difference between these types of acquisitions when using EVA as a measure of operating performance.

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