

# THE MEASUREMENT OF POST-ACQUISITION PERFORMANCE: TOWARD A VALUE-BASED BENCHMARKING METHODOLOGY

by Mark L. Sirower,  
New York University, and  
Stephen F. O'Byrne,  
Shareholder Value Advisors Inc.\*

*So many mergers fail to deliver what they promise that there should be a presumption of failure. The burden of proof should be on showing that anything really good is likely to come out of one.*

—Warren Hellman, former head of Lehman Brothers (1994)

**A**cquisitions remain the most popular method of corporate growth of this generation's executive teams, with over \$4 trillion worth of such transactions in the past eight years. Indeed, new records for both the number and dollar volume of mergers and acquisitions are being set almost daily. But there is little evidence that such transactions have benefited the shareholders of the acquiring companies, on average. Study after study by financial economists suggests that the lion's share of the gains from mergers accrues to the target firm's shareholders—and that the acquiring company's shareholders should consider themselves lucky just to “break even.”

Although we now have measurements that tell us that most acquisitions fail to add value for the acquiring company's shareholders,<sup>1</sup> measuring the actual *operating* synergies that *do* result from acquisitions is still an unexplored area. It is the discrete nature of acquisitions—the sudden transformation of two stand-alone companies into a single entity—that creates an exciting living laboratory to explore performance measurement issues. Unlike many other capital investment decisions that are spread over

time such as R&D or advertising campaigns, acquisitions are management decisions whose impact on shareholder value is assessed immediately by markets around the world. For example, in the six-month battle for Paramount, Viacom shareholders saw the value of their holdings fall by more than half—most of it within a week of Viacom's initial announcement. More recently, upon announcement of its acquisition of Green Tree, Conesco lost more than \$1.3 billion—an amount roughly equal to the premium it paid to acquire Green Tree. On the other side of the coin, Procter & Gamble recently gained over \$2 billion of market value within one week of the company's announcement of its acquisition of Tambrands. As these examples serve to illustrate, shareholders of acquiring companies experience a wide distribution of wealth changes when acquisitions are announced.

Our aim in this paper is to develop and illustrate a methodology for forecasting and evaluating post-acquisition *operating* performance that will be of interest to both corporate practitioners and researchers. Instead of simply comparing post-acquisition with pre-acquisition measures of operating perfor-

\*A version of this article was presented in the “New Frontiers in Mergers and Acquisitions Research” Symposium, 1997 Academy of Management Meetings, Boston, MA.

1. For a summary of such research, see M. L. Sirower, *The Synergy Trap: How Companies Lose the Acquisition Game* (New York: Free Press, 1997).

mance, as most academic studies (and many corporate reporting schemes) do, our method uses the pre-acquisition *market* values of both companies and the acquisition premium to determine the future levels of annual operating performance that are necessary to justify the investment. Also in contrast to prior approaches, our operating performance measures are expressed in terms of annual expected increases in EVA, or economic value added. As such, these measures provide a useful economic basis both for acquisition planning and for post-acquisition performance evaluation and incentive compensation for managers.

One by-product of our benchmarking methodology is that it enables researchers and practitioners to make a careful assessment of the validity of stock market reactions to the announcements of these major discretionary corporate investment decisions. Most studies of the stock market response to acquisitions during the 1980s and early 1990s report a roughly 65/35 split between negative and positive reactions to the acquiring companies. And studies of the most recent large M&A transactions from 1994-1997 are yielding virtually the same results.<sup>2</sup> But many observers—not to mention many corporate “strategists”—have questioned whether these shareholder returns are meaningful predictors of long-run performance. For example, Michael Porter has argued that short-term market reactions are likely to have little long-term significance, while asserting that “no self-respecting executive would judge a corporate strategy this way.”<sup>3</sup>

Given the potentially dramatic effects on the wealth of shareholders, practitioners and researchers need to find a way to assess the validity of these market value changes—to determine whether the investors correctly anticipate the long-run effect of acquisitions on shareholder value. We examined the market’s response to 41 large acquisitions between 1979 and 1990, and found a strikingly high correlation between the acquiring company’s short-term stock returns and a present value measure of its first five years of post-acquisition operating performance based on our benchmark. By underscoring the importance of stock-market reactions to acquisition announcements, our results strengthen the case for using our value-based methodology.

## A BRIEF INTRODUCTION TO THE PERFORMANCE MEASUREMENT PROBLEM

When executive teams play the acquisition game, they pay an up-front price that virtually always includes a substantial premium. To the extent the premium is justified, it must be based on the acquirer’s expectations of making improvements in the target firm’s future performance and exploiting other synergies between the two firms. Only when performance gains above stand-alone expectations are large enough (in present value terms) to recapture the premium can an acquisition begin to create value for the shareholders of the acquiring company.

Little research has focused on an appropriate method for determining what the actual synergies are from a given acquisition. But there is one major challenge in developing such a method: namely, finding an appropriate benchmark against which to compare post-acquisition operating performance to determine the real performance gains.

Acquisitions possess unique features that are important in framing the benchmarking problem. First, acquisitions are a capital investment decision that the shareholders of the acquirer can essentially make on their own—just by buying the shares of other companies—without paying either premiums or integration expenses. Second, unlike virtually any other capital investment decision, an acquisition requires paying all the money up front, including the acquisition premium, before any improvements can begin. Finally, paying the acquisition premium creates an additional business problem—achieving performance gains above those already reflected in the share prices of the two stand-alone firms.

In cases where no performance improvements are expected to result from the acquisition, one can forecast the performance of the post-acquisition firm simply by summing the performance expectations for the two “stand-alone” companies. Acquisition premiums are promises of performance gains above those already expected by the market. And so, the base-case benchmarking issues are (1) what is the appropriate measure of performance; and (2) given this measure, how do we assess stand-alone expectations at the time of the acquisition? Once we have developed a method for quantifying stand-alone

2. For a review, see M. Sirower and S. Francis, “Acquisition Strategies and Shareholder Performance: A Study of Major Transactions of the 1990’s,” New York University working paper.

3. M. E. Porter, “From Competitive Advantage to Corporate Strategy,” *Harvard Business Review* (May/June 1987), p. 45.

**Most studies of the stock market response to acquisitions during the 1980s and early 1990s report a roughly 65/35 split between negative and positive reactions to the acquiring companies. But many observers have questioned whether these shareholder returns are meaningful predictors of long-run performance.**

expectations, we can easily add the additional performance requirements (i.e., the required synergies) created by the payment of an acquisition premium. An effective benchmarking methodology, as we will show, enables management and outside observers to monitor the economic results of a given acquisition strategy. The expected results will be embedded in the stock market reaction to the announcement of the acquisition.

To date, financial researchers have typically used *either* stock returns or accounting returns independently to assess the performance gains resulting from an acquisition. Most studies of the stock returns of acquiring companies have focused either on short-term (anywhere from two days to six months surrounding the announcement) or on long-term (one- to five-year) price movements. The findings of such studies (including accounting-based studies) are remarkably consistent in that virtually all seem to show negative average returns to acquirers. Moreover, studies of long-term shareholder returns found *declining* returns to acquirers over time.<sup>4</sup>

In recent years, some studies have attempted to assess the validity of short-term stock market reactions to acquisitions by *linking* those reactions to long-term stock returns. For example, one study took 168 large (over \$100 million) acquisitions from the period 1979 to 1990 and divided them into two portfolios, those with positive and negative stock market reactions, and then tracked the stock market performance of these two portfolios over a four-year period following the acquisitions.<sup>5</sup> The “negative” portfolio remained significantly negative and the “positive” portfolio remained significantly positive for the four years following the acquisition. Moreover, a similarly designed study of the 100 largest deals announced during the period 1994-1997 found essentially the same results.<sup>6</sup> These findings suggest that the market’s immediate response to the announcement of an acquisition provides an “unbiased” forecast—that is, neither too pessimistic nor

too optimistic, on average—of the long-run effect of the acquisition on the acquiring firm’s value.

While the method of these studies is useful for determining shareholder wealth effects, it does not provide a benchmark of stand-alone *operating* performance that can be used for pre-acquisition planning or post-acquisition performance evaluation. To be sure, there is now an extensive literature that uses accounting returns to measure post-acquisition performance.<sup>7</sup> Such studies typically take some conventional profitability measure—such as return on sales, return on assets, or return on equity—and then compare post-acquisition to pre-acquisition performance on that basis. The major assumption of this approach is that past performance is the benchmark for future performance.

There are two serious problems with the typical method of accounting-based studies of post-acquisition performance. First, different studies examine different accounting measures of performance (such as ROS or ROA), making it difficult to compare results. Thus, it is not clear which accounting-based measure should be used. And compounding this measurement problem are “distortions” of economic performance introduced by several accounting conventions, such as purchase accounting’s amortization of goodwill, which in turn lead to potentially different interpretations of performance.<sup>8</sup>

Second, and even more important, is *the benchmark itself*. The truly critical shortcoming of using past accounting performance as a benchmark is that it ignores an important aspect of the economics of acquisitions: *the promise implicitly made by the buying company’s management to its own shareholders in its willingness to pay a premium to target shareholders*. Clearly post-acquisition operating performance must be improved; but the question is, by how much to justify the acquisition premium? Past performance is largely irrelevant in answering this question. Acquirers do not purchase past performance; they combine two entities each with pre-existing performance expectations after paying a

4. In summarizing this body of stock-market research on M & A, Richard Ruback states, “Reluctantly, I think we have to accept this result—significant negative returns over the two years following a merger—as a fact.” (See R. Ruback, “Comment,” in ed. Alan Auerbach, *Corporate Takeovers: Causes and Consequences* (Chicago: University of Chicago Press, 1988), p. 262.

5. See Sirower (1997). See also S. N. Kaplan and M.S. Weisbach, “The Success of Acquisitions: Evidence from Divestitures,” *Journal of Finance* 47 (1992), pp. 107-138.

6. Sirower and Francis (1998).

7. See D. J. Ravenscraft and F.M. Scherer, “The Profitability of Mergers,” *International Journal of Industrial Organization* 7 (1989), pp. 101-116; E. S.

Herman and L. Lowenstein, “The Efficiency Effect of Hostile Takeovers,” in eds. J.C. Coffee, Jr., L. Lowenstein, and S. Rose-Ackerman, *Knights, Raiders, and Targets* (New York: Oxford University Press, 1988), 211-240; P. Healy, K. Palepu, and R. Ruback, “Do Mergers Improve Corporate Performance?,” *Journal of Financial Economics* 31 (1992), 135-175; and D. C. Mueller, “Mergers: Theory and Evidence,” in, ed., G. Mussati, *Mergers, Markets and Public Policy* (Netherlands: Kluwer Academic Publishers, 1995), pp. 9-43.

8. See G. Meeks and J. G. Meeks, “Profitability Measures as an Indicator of Post-Merger Efficiency,” *Journal of Industrial Economics* 29 (1981):335-344; and R. Jacobson, “The Validity of ROI as a Measure of Business Performance,” *American Economic Review* 77 (1987), pp. 470-478..

premium to the shareholders of the selling firm. In so doing, they allocate capital to an investment that has an opportunity cost. Ignoring this cost of capital is equivalent to ignoring the return to the acquiring company's shareholders that is necessary just to preserve value.

Because stock prices reflect *expectations* of future performance—and this is the critical point of our analysis—an appropriate post-acquisition performance benchmark must consider the information already built into in pre-acquisition market values. This is the base case.

### **A NEW BENCHMARKING METHODOLOGY: REQUIRED IMPROVEMENTS IN ECONOMIC VALUE ADDED**

Since the shareholders of a firm contemplating an acquisition can buy the shares of both the acquiring and acquired companies on their own, an acquisition should be made only when performance can be achieved that would not have occurred had the firms remained independent. Thus, an appropriate definition of post-acquisition performance gains, or synergies, are the improvements in performance over and above what is already expected—that is, those improvements already embedded in the security prices of the two independent firms. If the benchmark fails to take account of performance improvements already priced in pre-acquisition market values, expected improvements observed after the acquisition might mistakenly be judged the *result* of the acquisition.

From a performance evaluation perspective, when an acquirer makes an acquisition the past essentially becomes irrelevant. A company with a stellar past can and will lose market value if it fails to meet the market's expectations. Wal-Mart, for example, lost approximately 33% of its equity value in 1993 and 1994. The company did not experience a 33% decline in any measure of operating performance over that period; in fact, sales increased by 49% and reported earnings increased by 45% over that two-year period. The market, however, was expecting considerably better performance and reduced the value of the shares accordingly.<sup>9</sup>

This case illustrates the problem in using past performance to benchmark the future. And in markets where prices are rising rapidly (such as the time of this writing), past performance becomes even less meaningful. What is important are the expectations of performance reflected in current prices. And, when evaluating the success of an acquisition for the acquiring firm's shareholders, it is essential to quantify those expectations. It is the market's expectations that lay the foundation for a performance benchmark.

The main challenge in developing a post-acquisition benchmark, then, is to determine what level of performance the market was expecting before the transaction is announced. And, in order to make that determination, we need a valuation model that links current market values to observable performance variables. More specifically, we want a method that explicitly separates the *known* components of market value from the *expectational* components.

### **The Post-Acquisition Performance Model**

The clue to separating these components was actually provided over 35 years ago in Miller and Modigliani's pathbreaking 1961 paper, "Dividend Policy, Growth, and the Valuation of Shares."<sup>10</sup> As M & M demonstrated in that paper, the total market value of the firm is the present value of future free cash flow (FCF) discounted at the weighted average cost of capital. So let's begin with M & M's well-known FCF formula:<sup>11</sup>

$$MV_0 = \sum_{t=0}^{\infty} \frac{X_t - I_t}{(1+c)^{t+1}} \quad (1)$$

where  $MV_0$  = the total market (debt plus equity) value of the firm at the beginning of year 0,  $X_t$  = net operating profit after taxes (or NOPAT) at the end of year  $t$ ,  $I_t$  = new investment at the end of year  $t$ , and  $c$  is the cost of capital.<sup>12</sup> The numerator of equation (1) represents the FCF for year  $t$ . In effect, the M & M formula says that the market value of the firm is the present value of expected free cash flows over an indefinitely long time horizon.

Unfortunately, FCF does not provide a reliable means of evaluating annual operating performance.

9. S. F. O'Byrne, "EVA and Market Value," *Journal of Applied Corporate Finance*, 9 (1996), pp. 116-125.

10. Merton Miller and Franco Modigliani, "Dividend Policy, Growth, and the Valuation of Shares," *Journal of Business*, Vol. 34 No. 4 (1961).

11. Miller and Modigliani (1961), p. 412, equation 11.

12. FCF is defined as  $NOPAT - I$ , where NOPAT is net operating profit after tax and  $I$  is investment. The taxes subtracted in the NOPAT calculation are the taxes that would be payable if there were no tax benefit to debt (since the tax benefit of debt is reflected in the cost of capital).  $I$  is the increase (or decrease) in capital, or net assets, for the year.

**The truly critical shortcoming of using past accounting performance as a benchmark is that it ignores an important aspect of the economics of acquisitions: *the promise implicitly made by the buying company's management to its own shareholders in its willingness to a pay a premium to target shareholders.***

The main shortcoming of FCF as a measure of *periodic* operating performance is that it subtracts the entire cost of an investment in the year in which it occurs rather than spreading the cost of the investment over the life of the asset that has been acquired. For example, “high-growth” companies can be adding large amounts of value while recording ever larger negative FCF, as did Wal-Mart in the late '80s; it was investing far more than its internal operating cash flow in highly profitable investment opportunities.

This shortcoming of FCF can be avoided by using the concept of Economic Value Added, or EVA. EVA is defined as net operating profit after taxes, or NOPAT, minus a capital charge equal to  $c \times \text{Capital}$ , where  $c$  is the weighted average cost of capital and Capital is the total invested capital at the beginning of the year.<sup>13</sup> Unlike FCF, EVA effectively capitalizes instead of expensing much corporate investment, and then holds management accountable for that capital by assigning the capital charge just described.

The present value of the cost of a new investment is the same for EVA and FCF. The present value of the depreciation expense and capital charge for EVA is exactly equal to the initial investment cost for FCF. We can show that the present value of future FCF is equal to the present value of future EVA *plus* beginning capital (we need to add back beginning capital to recover the EVA charge on beginning capital—a charge that does not affect FCF). This form of the EVA equation can be summarized as follows:

$$\text{Market Value} = \text{Invested Capital} + \text{Present Value of Future EVA}$$

The EVA concept is also especially useful for performance evaluation because it allows us to dissect a company's market value into its *known* and *expectational* components. We can do this by breaking the present value of all future EVA into two pieces: (1) the present value of the company's *current* EVA; and (2) the present value of the

expected EVA *improvements* above the current level. It was M & M who also laid the groundwork for this insight in the following formula (which follows directly from the FCF equation (1)):<sup>14</sup>

$$MV_0 = X_0/c + \sum_{t=0}^{\infty} I_t (r_t - c)/(c(1+c)^{t+1}) \quad (2)$$

where  $X_0$  is the (uniform perpetual) earnings on the current asset base,  $I_t$  is the new investment at the end of year  $t$ ,  $r_t$  is the constant rate of return on  $I_t$ , and  $c$  is the cost of capital.

Incorporating the EVA concept into equation (2), we can derive the following fundamental EVA equation that breaks total market value into its known and expectational components:<sup>15</sup>

$$MV_0 = \text{Cap}_0 + \text{EVA}_0/c + ((1+c)/c) * \sum_{t=1}^{\infty} \Delta\text{EVA}_t/(1+c)^t \quad (3)$$

where  $MV_0$  is market value at the end of year 0,  $\text{Cap}_0$  is book capital at the end of year 0,  $\text{EVA}_0$  is EVA for year 0, and  $c$  is the weighted average cost of capital (so  $\text{EVA}_0 = \text{NOPAT}_0 - c \times \text{capital}_{-1}$ ), and  $\Delta\text{EVA}_t$  is investors' expectation, at the end of year 0, of EVA improvement in year  $t$ .

The sum of the first two terms, capital ( $\text{Cap}_0$ ) and capitalized current EVA ( $\text{EVA}_0/c$ ), can be called “current operations value.” The third term, the capitalized present value of the expected annual EVA improvements, can be called “future growth value,” or FGV. The distinction between current operations value and future growth value is critical to understanding the relationship between EVA, which is a measure of return on book capital, and shareholder return, which is based solely on market value.

Investors expect a cost-of-capital return on the *total* market value of the company. This means that they expect a cost-of-capital return on current operations value *and* a cost-of-capital return on future growth value. If a company just maintains its EVA—that is, has no EVA improvement—its NOPAT will provide a cost-of-capital return on current operations value, *but no return at all on future growth*

13. We use net assets, or total assets minus non-interest bearing current liabilities, as our measure of capital (rather than total assets) because we do not add back to operating profit the implicit financing expense in accounts payable and accrued expenses (and thus do not take a capital charge on that amount).

14. M & M (1961: 416, equation 12)

15. The original M&M equation 12 is:  $X_0/p + \sum_{t=0}^{\infty} I_t (p^*(t) - p)/(p(1+p)^{t+1})$ , where  $X_0$  is the (uniform perpetual) earnings on the current asset base,  $I_t$  is the investment at the end of year  $t$ ,  $p^*(t)$  is the constant rate of return on  $I_t$  and  $p$  is the cost of capital. O'Byrne (1996) transposes this equation into the language of EVA

using notation in which market value<sub>t</sub> is the market value at the *end* of year  $t$ ,  $X_0$  is  $\text{NOPAT}_0$ ,  $I_t (p^*(t) - p)$  is the EVA improvement in year  $t+1$  ( $\Delta\text{EVA}_{t+1}$ ), and  $p$  is the cost of capital  $c$ . Thus, the M&M equation becomes:  $\text{Market value}_{-1} = \text{NOPAT}_0/c + \sum_{t=1}^{\infty} (\Delta\text{EVA}_t)/(c * (1+c)^t)$ . If we add and subtract  $\text{NOPAT}_{-1}/c$  and  $(\text{Capital}_{-1} - \text{Capital}_{-2})$  to the right side of this equation, we can show that this is equivalent to:  $\text{Market value}_{-1} = \text{Capital}_{-1} + \text{EVA}_{-1}/c + \Delta\text{EVA}_0/c + \sum_{t=1}^{\infty} (\Delta\text{EVA}_t)/(c * (1+c)^t)$ , which becomes:  $\text{Market value}_{-1} = \text{Capital}_{-1} + \text{EVA}_{-1}/c + (1+c)/c * \sum_{t=0}^{\infty} (\Delta\text{EVA}_t)/(1+c)^{t+1}$ .

value.<sup>16</sup> Since constant EVA provides a cost-of-capital return only on current operations value, we must have EVA *improvement* to earn a cost-of-capital return on future growth value and, hence, a cost-of-capital return on total market value. This is the foundation of our performance benchmark.

The EVA improvement required to provide a cost-of-capital return on future growth value, what we call *expected EVA improvement*, must satisfy the following:

$$\Delta EVA_1 + \Delta EVA_1/c + \Delta FGV_1 = c \times FGV_0^{17}$$

Thus, the return on FGV must be provided by EVA improvement and the change, if any, in FGV. One common approach to estimating  $\Delta FGV$  is to make the assumption that competition will eliminate the opportunity to earn superior returns on new capital over a “competitive advantage period.” This implies that  $FGV_0$  will amortize to zero over the competitive advantage period and, hence, that  $\Delta FGV$  is negative. This assumption, while convenient, is difficult to support empirically since few companies have zero or negative future growth values. Moreover, in rising stock markets, FGV may actually be increasing and, hence,  $\Delta FGV$  is positive. For simplicity (since a thorough discussion of  $\Delta FGV$  models would substantially extend this article), we assume that  $\Delta FGV = 0$  (i.e., that FGV remains constant). The assumption that  $\Delta FGV = 0$  implies that  $\Delta EVA_1 + \Delta EVA_1/c = c \times FGV_0$ .

Each dollar of EVA improvement provides value in two ways: it adds a dollar to current free cash flow and it adds its perpetuity value, or  $1/c$ , to current operations value. This makes the total contribution of each dollar of EVA improvement equal to  $1 + (1/c)$ ; hence, each \$1 of  $\Delta EVA$  provides  $(1+c)/c$  of value. To provide a total value of  $c \times FGV_0$ , we need enough  $\Delta EVA$  to satisfy the following equation:

$$\begin{aligned} \Delta EVA_1 \times (1 + c)/c &= c \times FGV_0, \text{ or} \\ \Delta EVA_1 &= [(c \times c)/(1 + c)] \times FGV_0 \end{aligned}$$

In other words, the company does not have to earn the entire FGV return in cash each period. Rather, as we illustrate in the example that follows, it needs an amount that, when capitalized, is equal to the present value of that cash return.<sup>18</sup>

## APPLICATION OF THE METHODOLOGY

In March of 1989, The Black & Decker Company announced an all-cash bid for the equity of Emhart Corporation for \$2.5 billion, a price that represented a 33% premium over Emhart’s pre-announcement value. The acquisition would more than double the size of the company. Nolan Archibald, Black & Decker’s CEO, justified the acquisition by asserting a “strategic fit” between Emhart’s plumbing and locks businesses and B & D’s home improvement customer base.

Table 1 illustrates the use of our methodology with Black & Decker’s 1989 acquisition of Emhart, beginning with Emhart’s pre-acquisition market value (without the premium).

Five days before the announcement of the acquisition, Emhart had a total market (book debt plus market equity) capitalization of \$2.732 billion. At the same time, its invested capital was calculated to be \$1.780 billion.<sup>19</sup> Based on the long-term Treasury yield of 8.45%, a market risk premium of 6%, and Emhart’s beta of 1.6, we also estimated the company’s weighted average cost of capital to be 14.44%. And, given the prior year’s beginning capital of \$1.434 billion, Emhart’s current NOPAT of \$186 million gave the company an EVA of –\$21 million.<sup>20</sup>

As shown in Table 1, capitalizing Emhart’s current EVA of negative \$21 million at 14.44% and adding invested capital gives Emhart a current operations value of \$1.635 billion. Subtracting the

16. This is an extremely important point, so let’s work through the calculations to see why it is true.  $EVA_1 = NOPAT_1 - (c \times Capital_0)$ , so  $NOPAT_1 = EVA_1 + c \times Capital_0$ . If  $EVA_1 = EVA_0$ , then  $NOPAT_1 = EVA_0 + c \times Capital_0$ . But  $EVA_0 + c \times Capital_0 = c \times (EVA_0/c + Capital_0) = c \times$  current operations at the end of year 0. Thus, NOPAT, with constant EVA, provides a cost-of-capital return on current operations value, but leaves nothing left over to provide a return on future growth value.

17. The proof for this is as follows:

From  $MV_0 = Cap_0 + EVA_0/c + FGV_0$ ,  $MV_1 = Cap_1 + EVA_1/c + FGV_1$ , and  $FCF_1 = NOPAT_1 - \Delta Cap_1 = EVA_1 + c \times Cap_0 - \Delta Cap_1$ , we can show that  $MV_1 + FCF_1 - MV_0 = c \times MV_0$  implies that:

$Cap_1 + EVA_1/c + FGV_1 + EVA_1 + c \times Cap_0 - \Delta Cap_1 - [Cap_0 + EVA_0/c + FGV_0] = c \times [Cap_0 + EVA_0/c + FGV_0]$ .

Hence:

$Cap_1 + EVA_1/c + FGV_1 + EVA_1 - \Delta Cap_1 - Cap_0 - EVA_0/c - FGV_0 = EVA_0 + c \times FGV_0$   
 $EVA_1/c + FGV_1 + EVA_1 - EVA_0/c - FGV_0 = EVA_0 + c \times FGV_0$   
Hence:  $c \times FGV_0 = \Delta EVA_1 + \Delta EVA_1/c + \Delta FGV_1$ .

18. We are solving for the annuity payment for an annuity beginning at the end of period 1 that, when capitalized, has a value equal to a cost-of-capital return on future growth value at time 0 received at the end of period 1. To illustrate, suppose we have a constant FGV of \$1000 and a cost of capital of 10%. We could require a constant cash return of \$100 each period or, equivalently, a series of improvements of  $\$100/((1+.1)/.1)$ , or \$9.09 each period in perpetuity.

19. We calculate capital as total assets minus non-interest-bearing current liabilities plus cumulative amortization (to account for all goodwill on the books) minus other long-term non-interest-bearing liabilities and deferred taxes.

20. We calculate NOPAT as the sum of net income, minority interest income, preferred dividends, after-tax interest, and amortization.

**The main shortcoming of FCF as a measure of *periodic* operating performance is that it subtracts the entire cost of an investment in the year in which it occurs. Unlike FCF, EVA effectively capitalizes instead of expensing much corporate investment, and then holds management accountable for that capital by assigning a capital charge.**

**TABLE 1\***

	Emhart (1989)	Current Operations Value	Future Growth Value
Market value (at \$30.63) <sup>a</sup> =	\$2,732		
Capital +	\$1,780		
Capitalized Current EVA (-\$21/.1444 <sup>b</sup> ) +	-\$145	\$1,635	
PV of Expected EVA Improvement	\$1,097		\$1,097

\*All numbers in millions of dollars except share price and cost of capital.

a. Market value is calculated as the market value of equity plus the book value of preferred stock, minority interest and interest bearing debt.

b. Cost of capital is the weighted average cost of capital using interest expense to calculate the cost of debt; cost of equity is found using the CAPM where beta is from a market model regression performed for an estimation period of day -280 to day -40 before the announcement of the acquisition for both bidder and target firms.

current operations value from its total market capitalization of \$2.732 billion gives us a Future Growth Value (FGV) for Emhart of \$1.097 billion.

As we discussed earlier, Emhart's FGV is equal to the present value of expected EVA improvements. Investors require a cost-of-capital return on the FGV as well as the current operations value component of total market value. Thus, investors' expected return on market value is  $\$2.732 \text{ billion} \times 14.44\% = \$395 \text{ million}$ , of which  $\$1.097 \text{ billion} \times 14.44\% = \$158 \text{ million}$  represents the expected return on Emhart's future growth value.

If we assume that each \$1 of EVA improvement is capitalized at its perpetuity value, then each \$1 of EVA improvement contributes  $\$1 + (\$1/.1444)$ , or \$7.93 of value. To provide a return of \$158 million on Emhart's future growth value (and assuming  $\Delta FGV = 0$ ), the company would need to achieve \$19.9 million ( $\$158/\$7.93$ ) of EVA improvement.

### The Effect of Paying a Premium

When Black & Decker acquired Emhart for \$40.72, it paid an acquisition premium of \$10.09 per share, or \$626 million. This effectively raised Emhart's future growth value from \$1.097 billion to \$1.723 billion. The acquisition premium of \$626 million is a direct addition to the FGV of Emhart because, until any performance gains occur, Emhart's current operations value is unchanged.

This, in turn, raised the required return on Emhart's future growth value from \$158 million to \$249 million and its expected EVA improvement from \$19.9 million to \$31.4 million. In the Emhart example, if we assume constant FGV, \$31.4 million is the amount of the company's *annual* expected EVA improvement necessary to provide a cost-of-capital return on FGV of \$1.723 billion.

We have made the simplifying assumption that Emhart's future growth value does not change over time. A very useful feature of this approach is that as long as the company provides a return on FGV, FGV will remain permanent market goodwill. That is, the FGV will not decay, so the required return on future growth value will remain constant.<sup>21</sup>

Our assumption that the market capitalizes \$1 of EVA improvement at its perpetuity value is also a simplification. For example, if the market instead capitalized \$1 of EVA improvement for Emhart at  $2 \times$  its perpetuity value, each \$1 would then contribute  $\$1 + 2 \times (\$1/c) = \$14.85$  of value. This would imply that Emhart's expected EVA improvement at \$30.63 per share was  $\$158/\$14.85 = \$10.6 \text{ million}$  and  $\$249/\$14.85 = \$16.8 \text{ million}$  at \$40.72 per share, as compared to expected improvements of \$19.9 million and \$31.4 million, respectively, where the perpetuity multiple is one.

Some recent research suggests that the market typically values the EVA improvements of positive EVA companies at more than their perpetuity value and the EVA improvements of negative EVA compa-

21. In a more elaborate analysis where an industry is becoming increasingly competitive, we could let future growth value decay. The company would have to make up for this and the decay would convert to current operations value (requiring a current cash return rather than a return to be capitalized at our

perpetuity multiple) for forecasting purposes. Alternatively, in rising markets (like we have today) future growth value would be increasing resulting in a lower required expected EVA improvement.

TABLE 2

	Old Black & Decker (1989)	Current Operations Value	Future Growth Value
Market value (at \$23.63) =	\$1,875		
Capital +	\$1,217		
Capitalized Current EVA ( $-\$59/.1783$ ) +	$-\$331$	\$886	
PV of Expected EVA Improvement	\$989		\$989

TABLE 3

	New Black & Decker (1989)	Current Operations Value	Future Growth Value
Market value (at \$23.63) =	\$5,233		
Capital +	\$4,575		
Capitalized Current EVA ( $-\$370/.1545$ ) +	$-\$2,395$	\$2,180	
PV of Expected EVA Improvement	\$3,053		\$3,053

nies at less than their perpetuity value.<sup>22</sup> For our purposes here, we assume that the market capitalizes \$1 of EVA improvement at its perpetuity value (multiple of one) for both positive and negative current EVA cases because we are combining firms that may not both have positive or negative current EVA. This minimizes any judgment that would need to be made and creates consistency across our analysis of the acquisition sample.

### Performance Expectations of the Acquirer

Having analyzed the performance expectations for Emhart both as a stand-alone company and with the acquisition premium, the next step in the analysis is to add the stand-alone performance expectations of the acquiring company, Black & Decker. Shown in Table 2 above are the market capitalization, current operations value, and future growth value of B & D five days before the announcement of the Emhart acquisition.

As Table 2 shows, prior to the acquisition, Black & Decker had a market capitalization roughly two thirds of that of Emhart. Like Emhart, B & D also was earning an operating rate of return that was less than its cost of capital, resulting in a current negative EVA.

In Table 3, we now combine the analysis in Tables 1 and 2 to create the pro-forma base year. The

pro-forma Black & Decker is the pro-forma sum of the two companies, giving effect to the changes in the capital base as a result of the capital committed to make the Emhart acquisition. The pro-forma base-case EVA can then be used to evaluate actual post-acquisition EVA improvements. For the acquirer to earn a cost-of-capital return on its pre-acquisition market value plus its total investment in the target, it must achieve the expected EVA improvement reflected in the pro-forma combined entity.

As shown in Table 3, five days before the announcement of the transaction, the new (pro-forma) Black & Decker had a total market capitalization of \$5.233 billion (Black & Decker stand-alone plus the total market capitalization of Emhart including the acquisition premium), total invested capital of \$4.575 billion, and a combined weighted average cost of capital of 15.45%. The capital of the pro-forma B & D exceeds the capital of the two stand-alone companies by \$1.578 billion, an amount equal to the difference between the market and book values of Emhart plus the acquisition premium.

Investors' expected return on this total market value is  $\$5.233 \times 15.45\% = \$808$  million, of which  $\$3.053 \text{ billion} \times 15.45\% = \$472$  million is the expected return on Black & Decker's future growth value.

If we assume that each \$1 of expected EVA improvement is capitalized at its perpetuity value,

22. See O'Byrne (1996). Positive EVA companies receive a premium value because a company that earns more than the cost of capital can increase its EVA simply by growing its business without any increase in its margins or rate of return. In a positive EVA situation, \$1 of EVA improvement is usually a precursor of additional EVA improvement, and hence, is valued by investors at more than its perpetuity value. For companies with negative EVA, however, the reduction in market value is usually significantly less than the perpetuity value of the negative

EVA. This makes sense if investors assume that the negative EVA will not persist in perpetuity; either management will change its strategy or outside intervention will force a change in strategy. For this reason, we would expect negative EVA to lead to a reduction in market value that is less than the perpetuity value of the negative EVA. This also implies that EVA improvements off a negative base produce increases in market value that are less than the perpetuity value of the EVA improvement.

**For the bidder to earn a cost-of-capital return on its pre-acquisition market value plus its total investment in the target, it must achieve the expected EVA improvement reflected in the pro-forma combined entity.**

then each \$1 of EVA improvement contributes  $\$1 + (\$1/.1545) = \$7.5$  of value. To provide \$472 million of value, Black & Decker needs  $\$472/\$7.5$ , or \$63 million, of EVA improvement to justify the combined stand-alone values of the two companies *plus* the \$626 million premium paid to acquire Emhart. Under our assumption of constant FGV, we will expect \$63 million of EVA improvement annually.

### **Evaluating Post-Acquisition Operating Performance**

As stated above, the pro-forma base-case EVA provides the basis for evaluating actual post-acquisition EVA improvements. For the acquirer to earn a cost-of-capital return on its pre-acquisition market value, it must achieve the expected EVA improvement reflected in the pro-forma combined entity.

To eliminate distortions from the choice of purchase vs. pooling accounting, we must make different pro-forma adjustments for acquisitions with purchase and pooling accounting. For purchase accounting, the capital of the pro-forma entity is the sum of the acquirer's book capital and the purchase price of the target (since the purchase price is included in the acquirer's capital for subsequent years).<sup>23</sup> For pooling accounting, the capital of the pro-forma entity is the sum of the acquirer's book capital and the target's book capital (since the target's book capital is included in the acquirer's capital for subsequent years). Pooling firms are easily identified as firms using only stock as the method of payment and where book capital in the year following the acquisition is a sum of the pre-acquisition book capital of the two companies.

The NOPAT of the pro-forma entity is the sum of the acquirer's and the target's NOPAT in the pro-forma base year (one year prior to the completion date of the acquisition).<sup>24</sup> The cost of capital of the pro-forma entity is the weighted (by market capitalization) average of the acquirer and target costs of capital.<sup>25</sup>

We can now compare the actual EVA improvements against expected EVA improvements for a five-year period following the acquisition. We subtract expected EVA improvement from actual EVA improvement in each of the five years and calculate the present value of the differences. Finally, from equation 3 earlier, we capitalize this present value by multiplying it by  $(1+c)/c$ . This number represents the capitalized value of excess performance relative to our performance benchmark and can be used to examine the accuracy of stock market reactions for the bidder around the announcement of the acquisition.

The accuracy of the market reactions to an acquisition will depend on how well investors forecast two variables: (1) the difference between the actual and expected EVA improvements of the acquirer over the post-acquisition period; and (2) the difference between the actual and expected future growth value of the acquirer at the end of the five-year measurement period. If the actual future growth value remains equal to our expected FGV (as we assume), then the abnormal returns for the acquirer are just equal to the present value of the capitalized  $(1+c/c)$  excess EVA improvements. If actual FGV exceeds expected FGV at the end of our five-year forecast period, then the actual acquirer return will be higher than the capitalized excess EVA improvements by the present value of the excess FGV.<sup>26</sup>

Table 4 shows the calculation of actual performance relative to the performance benchmark and the capitalized present value of excess EVA improvements.

For the 10 days surrounding the announcement of the Emhart acquisition, the abnormal return (the calculation of which is described in the next section) in dollars for Black & Decker was  $-\$270$  million. That is, based on its expectations of future operating performance, the market was effectively forecasting that B & D overpaid by \$270 million. In fact, our calculations reported in Table 4 show that the capitalized present value of excess EVA improve-

23. We are essentially converting FGV to pro-forma capital to recompute what EVA would have been if the target firm's FGV (including the premium) had been part of invested capital. Otherwise we would have a drop in EVA, suggesting that we would need a cash return of  $c \times \text{FGV}$  in NOPAT in the acquisition. Because we are examining *improvements*, the issue is creating a level playing field for pre- and post-acquisition accounting.

24. In deals using purchase accounting, pro-forma NOPAT for the acquisition year, i.e., the year following the base year, includes an adjustment for the target's NOPAT prior to the acquisition. We calculate the adjustment by taking the prior year's NOPAT, dividing it by 12, and adding the appropriate number of months to the acquisition date.

25. The expected EVA improvement reflected in the pro-forma combined entity is approximately, but not exactly, equal to the sum of the expected EVA improvement reflected in the acquirer's pre-acquisition market value and the expected EVA improvement reflected in the acquisition price. The relationship is not exact because the current operations value of the pro-forma combined entity is not exactly equal to the sum of the independent current operations values.

26. See S. F. O'Byrne, "EVA and Market Value," *Journal of Financial Practice and Education* (Summer 1997).

TABLE 4

Black & Decker	Pro forma	Year 1	Year 2	Year 3	Year 4	Year 5
Beginning Capital	4,482	4,575	4,778	4,261	3,865	3,638
NOPAT	323	261	370	322	-116	250
Cost of Capital	15.45%					
EVA	-370	-446	-368	-337	-742	-347
EVA Improvement		-76	78	31	-405	395
Expected EVA Improvement		63	63	63	63	63
Excess EVA Improvement		-139	15	-32	-468	332
PV of Excess EVA Improvement		-120	11	-21	-263	162
Cumulative PV of Excess $\Delta$ EVA	-231					
Capitalized Cumulative PV	-1,733					
11-Day Acquirer Market Reaction	-270					
PV of Five-Year Excess Shareholder Return	-693					

ments was about negative \$1.7 billion. In this case, the market's initial reaction got the direction right, but understated the magnitude. And, over the longer term, the shares of Black & Decker continued to underperform, reflecting a shortfall in operating performance that was far larger than the one foreseen in the market's initially negative reaction.

Although Emhart had some businesses that seemed to fit with those of B & D, it had other businesses, such as the manufacture of golf-club shafts and glass-making equipment, where potential synergies were even less likely. It was only recently that CEO Archibald announced that some of these unrelated businesses were for sale, but the market clearly saw problems from the beginning.

### Summing Up the Benchmarking Method

We can summarize the major steps in our benchmarking methodology as follows:

Step 1: Construct the pro-forma base case (the capital of the pro-forma entity will depend on accounting method as discussed above).

Step 2: Calculate the expectational component of market value—the future growth value—for both the acquirer and target (including the acquisition premium).

Step 3: Calculate the cost-of-capital return on FGV and the EVA improvement that has a perpetuity value equal to this cost-of-capital return. *This is the performance benchmark.*

Step 4: Calculate actual EVA improvements.

Step 5: Compute excess EVA improvements.

Step 6: Capitalize the present value of excess EVA improvements.

Step 7: Compare to dollar abnormal performance of the acquiring firm.

### EMPIRICAL METHODS AND RESULTS

To test the stock market's ability to forecast future economic returns to acquisitions, we examined the stock market's response to announcements of large acquisitions in relation to five years of post-acquisition operating performance. The data sources used to develop the acquisition sample were the Merger and Acquisition Journal database, the Securities Data Corporation database, the CRSP (Center for Research in Security Prices) tapes and the *Wall Street Journal Index*. The preliminary sample for this study was taken from a sample that included all acquisitions of NYSE or AMEX targets that were made by NYSE or AMEX acquirers during the period 1979-1990.<sup>27</sup> COMPUSTAT is the data source for the NOPAT and book capital numbers we used for calculating our EVA performance metric.

Acquiring firms could not have announced or completed another major acquisition during a five-year period (starting with the year the acquisition was completed) and target firms were required to be at least 35% of the size of the acquirer in terms of equity market value. Thus, these acquisitions represent a truly major change/addition to the corporate strategy of the acquirer (unlike smaller

27. Sirower (1997).

**Based on its expectations of future operating performance, the market was effectively forecasting that B & D overpaid by \$270 million. In fact, our calculations show that the capitalized present value of excess EVA improvements was about negative \$1.7 billion.**

**TABLE 5 ■ DESCRIPTIVE STATISTICS**

Variable	N	Mean	Std Dev	Minimum	Maximum
Target Equity Value—5 days pre-announcement	41	1656.25	2194.31	34.04	8907.69
Acquirer Equity Value—5 days pre-announcement	41	2471.91	3713.32	33.81	14747.03
Relative Size—Target/Acquirer Equity Capital	41	0.76	0.41	0.36	2.42
Dollar Premium	41	508.91	748.65	-0.52	2977.63
Percent Premium	41	29.76	16.67	-0.21	66.25
Percent Shareholder Return—Market Reaction	41	-3.56	8.58	-19.57	14.69
Dollar Shareholder Return—Market Reaction	41	-136.04	286.08	-1411.29	165.78
Dollar Shareholder Return—5yr Excess	41	-904.59	2247.12	-9472.24	4234.14
Dollar Shareholder Return—PV of 5yr Excess	41	-395.52	1017.08	-4192.13	2218.68
Capitalized PV of Excess EVA Improvement	41	-1173.40	2355.30	-8490.13	4387.71

acquisitions, which may simply appear as “noise” when calculating both expected and actual EVA improvements). Acquiring firms could not have previously owned more than 5% of the target and the acquisition must have been accomplished in one transaction. Thus all acquisitions in the sample were the result of major discretionary management decisions that represented discrete changes/additions to current corporate strategy. The final sample included 41 major strategic acquisitions.

We calculated two measures of shareholder return for the acquirer: (1) a short-term reaction to the announcement of the acquisition (from five days before to five days after the announcement); and (2) a five-year excess return based on the cost of equity.<sup>28</sup> In theory, these two shareholder return measures and the operating performance relative to our performance benchmark should be highly correlated. For the purpose of our analysis, we used the present value of the five-year excess shareholder return measure because our performance metrics and the market reaction are in present value terms.

Table 5 reports the means and standard deviations of details of our sample along with shareholder returns and EVA performance measures. The average size of acquirers was over \$2.4 billion and the average target is over \$1.6 billion. The average sizes of the targets relative to their acquirers in the sample (target market cap/acquirer market cap) was more

than 75%; thus, these were truly major decisions for the acquirers. The average acquisition premium paid was about 30%, ranging from almost zero to over 66%. In dollar terms, the average acquisition premium was over \$500 million, so target shareholders did very well.

How did the shares of acquiring firms perform around announcement of these acquisitions? The average abnormal percentage return for the sample around announcement was -3.6 percent, or an average loss of over \$130 million in dollar terms. There was considerable variation in these returns, however, with initial market reactions ranging from -19.6% to +14.7%. Consistent with past studies, we found a 66/34 split between negative and positive reactions to acquirers’ announcements.<sup>29</sup>

In Table 6 we report the three key performance measures for each of the 41 acquisitions in our sample. In 26 of the 41 cases, the direction of market reaction (positive or negative) was consistent with our EVA performance metric. The results were even better for the five-year shareholder return, where the direction of our EVA performance measure was consistent with 30 of the 41 cases. For 32 of the 41 cases, our EVA performance measure showed a negative return. And, in 22 of those 32 cases, the initial market reaction was negative; and in 26 of those 32 cases, the longer-term shareholder returns were consistent with our operating performance measures.

28. For the short-term measure, an Ordinary Least Squares (OLS) market model was estimated for each company in the sample using 200 daily return observations from day -240 to day -40. Using the parameter estimates of the market model, abnormal returns are estimated for every security for the time period day -5 to day +5 (and then multiplied by market value on day -6 for results in dollars) as follows:  $A_{i,t} = R_{i,t} - \alpha_i - \beta_i R_{m,t}$ , where  $\alpha_i$  and  $\beta_i$  are OLS values from the estimation period,  $R_{m,t}$  is the return on the CRSP equally weighted market index for day (month)  $t$  and  $R_{i,t}$  is the actual return for security  $i$  on day  $t$ .  $A_{i,t}$  is the abnormal return. We

also calculated a simple market adjusted return ( $A_{i,t} = R_{i,t} - R_{m,t}$ ) and found it to be highly correlated with the OLS abnormal return. Our five year excess return measure is the actual compounded return on equity (price appreciation plus dividends) less the expected compounded return based on the cost of equity capital of the combined firm.

29. See, for example, N. P. Varaiya and K. R. Ferris, “Overpaying in Corporate Takeovers: The Winner’s Curse,” *Financial Analysts’ Journal* (May/June 1987), pp. 64-73.

TABLE 6

ACQUIRER	TARGET	Year Announced	Relative Size Equity Values	Market Reaction	PV 5YR Excess Share Return	Captlzd. PV Excess EVA
Allied Inc	Signal Cos	85	1.10	-430	-1198	-1470
Allied Chemical Inc	Eltra Corp	79	0.36	51	110	-1267
American General Corp	NLT Corp	82	0.75	-175	560	276
American Standard Co Inc	Trane Co	83	0.39	-49	266	-214
American Stores Co	Lucky Stores Inc	88	0.62	94	-218	-1063
Ampco-Pittsburgh Corp	Buffalo Forge Co	81	0.36	-2	-62	-188
Baker-Hughes Inc	Hughes Tool Co	86	0.59	24	246	4388
Baxter International Inc	American Hospital Supply	85	1.16	35	-129	-2390
Black & Decker Corp	Emhart Corp	89	1.07	-270	-693	-1733
Bristol-Myers Squibb	Squibb Corp	89	0.54	-1411	-4192	-8490
Burroughs Corp	Sperry Corp	86	1.05	-13	-2650	-4439
Champion International Corp	St Regis Corp	84	1.01	-195	-610	1100
Chevron Corp	Gulf Corp	84	0.67	-634	-1796	-4505
Coastal Corp	American Natural Resources	85	2.42	100	799	-232
Conagra Inc	Peavey Co	82	0.37	-23	325	108
Du Pont (E I) De Nemours	Conoco Inc	81	0.56	-409	-762	-6313
Fairchild Industries Inc	VSI Corp	80	0.73	-18	-18	-265
Fluor Corp	St Joe Minerals Corp	81	0.50	-461	-2714	-4069
Georgia-Pacific Corp	Great Northern Nekoosa Corp	89	0.40	-538	-965	-4440
Hanna (M. A.) Co	Day International Inc	87	1.00	31	-1	951
Johnson Controls Inc	Hoover Universal Inc	85	0.55	-38	41	-228
Kroger Co	Dillon Cos	82	0.45	-187	-213	-454
Lennar Corp	Development Corp of America	86	0.52	14	-36	-221
Lukens Inc	General Steel Inds	81	0.81	1	-25	-69
Mattel Inc	Western Publishing Inc	79	0.54	-11	-69	-2041
May Department Stores Co	Associated Dry Goods Corp	86	0.54	-226	-642	-2235
Maytag Corp	Magic Chef Inc	86	0.53	-15	-684	-1126
Mobil Corp	Superior Oil Co	84	0.43	-664	-230	-2516
Monsanto Co	Searle (G.D.) Co	85	0.61	166	2219	885
National Education Corp	Advanced Systems Inc	87	0.44	6	-197	-436
PanEnergy Corp	Texas Eastern Corp	89	1.18	-166	-556	3064
Salant Corp	Manhattan Industries Inc	88	1.92	2	-10	-58
Southdown Inc	Moore McCormack Resources	88	0.76	10	-158	-592
Springs Industries	Lowenstein (M.) Corp	85	0.87	25	131	-46
Sunshine Mining & Refining	Woods Petroleum Corp	85	0.96	-4	-199	-851
Texaco Inc	Getty Oil Co	84	0.62	85	-694	903
Textron Inc	Avco Corp	84	0.72	-75	-159	-1986
Todd Shipyards Corp	Aro Corp	85	0.51	-8	-142	135
Travelers Group Inc	Primerica Corp	88	1.17	-83	27	-1247
U.S. Airways Group Inc	Piedmont Aviation Inc	87	0.83	-14	-811	-4467
Williams Cos Inc	Northwest Energy	83	0.47	-103	-106	-267

More important than these results are the correlations between our two shareholder return measures and our EVA based performance measures (reported in Table 7). Three major findings stand out.

First, consistent with past studies, the initial returns are highly correlated with long-term stock returns (in present value terms); the correlation coefficient is .73 (where 1.0 means perfectly correlated). An interpre-

**Our study provides a strong validation of our performance metric in relation to both initial market reactions and long-term shareholder performance. With a correlation of .68, more than 46% of the variance of initial stock market returns was explained by our EVA improvement measure. And the results for the long-term shareholder return measure are equally impressive.**

**TABLE 7**  
CORRELATION TABLE OF  
MAJOR VARIABLES

	ACQRET55	RAWPREM	PVX5YEQ	CPVXEVAI
ACQRET55	1.00			
RAWPREM	-0.56	1.00		
PVX5YEQ	0.73	-0.59	1.00	
CPVXEVAI	0.68	-0.51	0.70	1.00

NOTES:

All correlations are significant at  $p < .0001$ .

ACQRET55 is Acquirer market reaction, 5 days before to 5 days following announcement.

RAWPREM is dollar premium paid for the target.

PVX5YEQ is present value of excess 5yr shareholder return.

CPVXEVAI is capitalized present value of excess EVA improvement.

tation of this result is that .73<sup>2</sup>, or more than 53%, of the variance of five-year excess shareholder returns to acquirers can be explained by the initial market reaction to the announcement.

Second, the acquisition premium is highly *negatively* correlated with both measures of shareholder returns. If prices paid for acquisitions really represented potential value, on average, then the premium paid should be uncorrelated with stock returns. When executives pay any premium, they are promising their shareholders a cost-of-capital return on this investment. Clearly, the market is suspicious of these payments right from the beginning, and shareholders of the acquirers, on average, pay the price in both the short term and the long term.

Third, and perhaps most important (given the focus of this study), is the strong validation of our performance metric in relation to both initial market reactions and long-term shareholder performance. With a correlation of .68, more than 46% of the variance of initial stock market returns was explained by our EVA improvement measure. And the results for the long-term shareholder return measure were equally impressive. We found a correlation of .70 between the present value of the five-year excess shareholder return and the capitalized future value of our EVA-based measure of operating performance.<sup>30</sup>

These are very important findings. Stock market reactions to acquisitions carry important meaning that can be observed by boards of directors before the effective date of these acquisitions. In many acquisitions, damage control will begin right from

the closing of the deal. With respect to the magnitude of the market reaction relative to capitalized excess EVA improvements, our findings support the strength of our performance benchmarking methodology.

Future research and in-practice applications of our performance benchmark can be tailored to account for issues such as changes in future growth value, the perpetuity multiple for EVA improvements in positive versus negative base EVA companies, definitions of NOPAT and invested capital, and the actual cost of capital.

### IMPLICATIONS FOR ACQUISITION PLANNING AND POST-ACQUISITION COMPENSATION ARRANGEMENTS

There can be many reasons that an acquisition strategy fails to earn its cost of capital. An acquirer may have no real strategy to begin with and thus pay an unjustified acquisition premium right from the beginning. Or there may be a complete failure in executing a fundamentally sound strategy. One major risk in acquisitions is the failure to close the gap that may exist between the strategic objectives and organizational design of the new organization and those of the old.<sup>31</sup> Issues such as new information systems and channels, management succession, new decision rights, and incentive systems must be planned carefully in light of where competitive performance gains are expected to result.

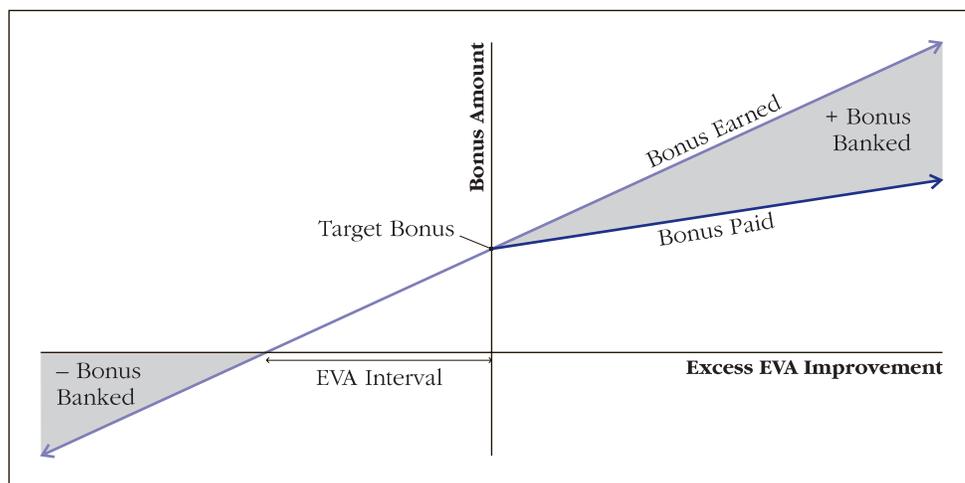
An important contribution of our benchmarking methodology is to show what the new organization must accomplish if it truly acts in the interests of its

30. We also performed a regression analysis where we treated the stock market performance measures as the dependent variable and the independent variables were the EVA improvement measures. As we expected, the intercept was not significantly different from zero, the regression coefficients were highly significant, and the (R<sup>2</sup>s) were approximately equal to the square of the correlation in Table 7. We performed

"White" tests for each regression and could not reject the hypothesis of homoskedasticity. See H. White, "A Heteroskedasticity-consistent Covariance Matrix Estimator and a Direct Test for Heteroskedasticity," *Econometrica* 48 (1980), pp. 817-838.

31. See B. Reeves and M. Sirower, "Managing Risk in M & A Strategies: A Guide for Senior Executives," *Price Waterhouse Review*, forthcoming.

**FIGURE 1**  
MODERN EVA BONUS  
PLAN



shareholders. It is the expected improvements in EVA that form the basis of a coherent compensation strategy to drive post-acquisition incentives. Without such a compensation strategy with clear performance objectives and rewards, effective pre- and post-acquisition planning will be extremely difficult.

Managers can be given a strong incentive to meet and exceed expected EVA improvement through a compensation plan that pays them (1) a competitive target bonus for achieving the expected EVA improvement plus (2) a fixed share of any excess EVA improvement (which may be negative). For an illustration of the concept, see Figure 1.

The bonus plan is based on three key concepts:

- **Target bonus:** a competitive bonus opportunity based on labor market compensation practices;
- **Expected EVA improvement:** the EVA improvement required for the acquirer's shareholders to earn a cost-of-capital return on the market value of their investment;
- **EVA interval:** the amount of the EVA shortfall that makes the bonus earned zero.

The EVA interval is the "leverage" factor that determines the manager's share of excess EVA improvement. The manager's share is equal to his/her target bonus divided by the EVA interval. The total bonus earned each year is the sum of the target bonus plus the fixed share of the excess EVA improvement. The bonus earned is credited to a "bonus bank," and the bonus bank balance, rather

than the current year bonus earned, determines the bonus paid. Typically, the payout rule for the bonus bank is 100% of the bonus bank balance (if positive), up to the amount of the target bonus, plus one third of the excess bonus bank balance.<sup>32</sup>

To illustrate the mechanics of the bonus, assume that a Black & Decker executive has a target bonus of \$200,000, an expected EVA improvement of \$63 million, and an EVA interval of \$120 million (which makes the executive's share of excess EVA improvement 0.17%). The bonus earned in the first year is  $\$200,000 + (.0017 \times -\$139,000,000) = -\$36,300$ , which leaves the (unhappy!) executive with a negative bonus bank of \$36,300. The bonus earned in the second year is  $\$200,000 + (.0017 \times \$15,000,000) = \$225,500$ . When the second-year bonus is credited to the bonus bank, the bonus bank balance is  $-\$36,300 + \$225,500 = \$189,200$ , and the bonus paid is positive. The bonus earned and paid for the third year is positive, but the huge negative EVA improvement ( $-\$468,000,000$ ) for the fourth year sends the executive (just like the shareholders) into a deep hole.

## CONCLUSION

Our research presents an effective methodology for benchmarking acquisition performance gains because it forces a consideration of (1) the future economic profits that are already priced into pre-acquisition market values and (2) the additional

32. For a detailed discussion of executive compensation and EVA, see S. F. O'Byrne, "Executive Compensation," *Handbook of Modern Finance*, 1997 edition (Warren Gorham & Lamont).

**Managers can be given a strong incentive to meet and exceed expected EVA improvement through a compensation plan that pays them (1) a competitive target bonus for achieving the expected EVA improvement plus (2) a fixed share of any excess EVA improvement (which may be negative).**

economic profits that senior management of the acquirer promises its shareholders with its payment of an acquisition premium. It is the explicit link between market values, an operating performance benchmark and actual shareholder returns that makes this research an important contribution for researchers and practitioners. Executives must understand the severity of the management challenge our benchmark represents before entering the acquisition game and paying an acquisition premium. If this picture is not well understood, as it often is not, strategic and implementation planning for synergy either pre- or post-acquisition can lead to disastrous consequences for the shareholders of acquiring firms. In fact, many deals may simply be dead on arrival.

From a research perspective, our performance benchmark can be calculated easily, and can be adapted for different accounting treatments. (Furthermore, it is grounded in the Nobel Prize-winning research on valuation theory by Miller and Modigliani.) Past studies that examined profitability changes after acquisitions were limited to documenting whether

an arbitrary measure of performance increased or decreased following an acquisition. Not only are we able to develop a benchmark that is directly related to the performance requirements embedded in the capital acquirers allocate when making an acquisition decision, but we are also able to assess the accuracy of stock market reactions to the announcement of acquisitions.

Because doubt is often expressed by both researchers and managers about the meaning of stock price reactions, the ability to show the connection between shareholder performance (positive and negative) and actual operating performance changes from an acquisition is an extremely important result. If executives teams do not fully appreciate the performance requirements embedded in their strategic investment decisions, their shareholders will pay a severe penalty in both the short and long term. The implications of this methodology are not limited to acquisitions. The concept of expected EVA improvements is important for both planning and evaluating any strategic decision that involves the allocation of capital.

■ MARK L. SIROWER

is a professor at New York University's Stern School of Business where he teaches business strategy and mergers and acquisitions. He is also author of *The Synergy Trap: How Companies Lose the Acquisition Game* (New York: Free Press, 1997).

■ STEPHEN F. O'BYRNE

is Managing Director and co-founder of Shareholder Value Advisors Inc.