Impact of EVA Adoption on Long-Term Shareholder Value: An Empirical Investigation

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Abstract

Our study examines Economic Value Added metric's link to long term shareholder value creation. We assume that EVA adoption directs a positive change in managerial behavior that in turn affects long-term value generation. Unlike most prior research that uses only one sample, we employ two samples. The first sample is based on 57 U.S. firms that Stern Stewart & Company has posted on its website. They report that these firms have achieved superior financial performance as a consequence of the adoption of EVA for the 1994-98 periods. The second sample is based on 178 U.S. firms' proxy statements for the 1994-1999 periods in which these firms have described EVA use as a part of their performance evaluation and compensation metric. Our study's results, using both long-term abnormal holding period returns and analyst forecast based on five-year growth of earnings per share show that EVA adoption has no significant impact on a firm's long-run performance when compared to a control sample matched on industry, size and past performance. Moreover, we find no evidence that EVA adoption induces greater shortsightedness as EVA adopters do not underperform, on average, the non-EVA firms.

Since the early 1990s the business press has presented an innovative and simple to understand and to apply value metric, Economic Value Added (trade-marked as "EVA") that could tie managerial motivation and performance to building shareholders' wealth. Since then, Fortune magazine has been publishing a 1000 performance ranking of the America's "best" or "real" wealth creators using EVA as a wealth predictor *(Fortune, December, 2004).* A recent article in Fortune magazine claims that "EVA-based analysis has proven extremely valuable in analyzing individual companies" (Colvin, G., Fortune, Feb. 21, 2008). The EVA developers, the consulting firm of Stern Stewart & Company, have refined the traditional residual income (RI) concept into a measure that tends to minimize the generally accepted accounting principles (GAAP) based distortions in economic earnings. They argue, "earnings, earnings per share, and earnings growth are misleading measures of corporate performance" (Stewart, 1991, p. 66).[2] They define EVA as the difference between the firm's net operating income after taxes (NOPAT) and the cost of *both* the debt and equity capital employed by the firm to generate NOPAT (Stern Stewart, 1993). The interest in EVA or EVA-types performance measures is not limited to the firms in the United States. Quite a few firms across the Atlantic in United Kingdom and in Germany and an increasing number in New Zealand and Australia are using EVA as an internal performance evaluation and incentive compensation tool.

According to Abate et al. (2004), EVA users are identified in three areas: corporate users, investment players, and value-based consultants. Some key corporate users include Coca-Cola, Eli Lilly, Home Depot, among many others. Examples of financial institutions include GAM and Oppenheimer Capital (on the buy-side) and Credit Suisse First Boston, Deutsche Bank Securities, Goldman, Sachs & Co. (on the sell-side). These investment players employ EVA

1. "Forget EPS, ROE, and ROI. The true measure of your company's performance is EVA." (Stern Stewart & Co., magazine advertisements). Copeland et al. (2000) use the term "Economic Profits" instead of Economic Value Added while assigning the same definition, i.e., a short-term financial indicator.

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approach in training their analysts in security valuation and portfolio management. On the consulting side, the EVA (economic profit) players include Boston Consulting Group, L.E.K. Consulting, Marakon Associates, Mckinsey & Co., and Stern Stewart & Co.

Our study examines EVA's link to long term shareholder value creation. We assume that EVA adoption directs changes in managerial behavior that in turn affects long-term value generation. Prior studies have demonstrated links between EVA measures and changes in behavior of managers for firms that adopt EVA. Biddle, Bowen, and Wallace (1999) investigate whether residual income (EVA)-based compensation plans affect managers' operating, investing, and financing decisions. Their results show that asset turnover experienced a significant increase of 14 percent, asset disposition increased 100 percent, new investment decreased 21, and share repurchase increased 112 percent, for residual income-based compensation plan adopter firms as compared to the control group in the post adoption period. Sheikholeslami (2001) based his study on the Wall Street Journal' Executive Pay Survey (April 10, 1997) data for 350 largest U.S. businesses and on Stern Stewart 1000 database and finds EVA to be linked to the compensation components (base salary, cash bonus, and long-term compensation) in a positive and significant way.

Riceman et al. (2002) investigate whether managers exhibit superior performance under EVA driven bonus scheme when compared to a control group. Their results show that, of the managers who are assessed using EVA bonus plans, only the ones who understand the EVA concept outperform managers who are compensated based on traditional accounting-based bonus plans.

Fatemi et al. (2003) examine the relationship between top management compensation and the two economic rates of return measures: EVA and Market Value Added (MVA is the present value of all expected future EVA). Specifically, the authors are interested in knowing whether compensation rewards managers for past performance or it encourages them to show higher future performance. They report strong association between executive compensation and MVA but a weak one with EVA. Fatemi et al. identify the most significant finding of their study as one that suggests that EVA and MVA based compensation contracts induce top managers to act in the long-term interest of shareholders even though doing so will impact short-term value creation.

Our study differs from past work on EVA in three distinct ways. First, unlike the prior research that primarily evaluates the relationship between firms' adoption of EVA and stock market performance strictly around the adoption date, our study provides evidence of EVA impact over longer term stock market performance. Second, our study focuses on how a firm's EVA adoption impacts financial analysts' consensus of growth of earnings per share for long-term forecast horizon. Finally, unlike most prior research that uses only one sample, we employ two samples to conduct empirical analysis. As with any application of shareholder methodology, the EVA researcher seeks some assurance that the management implements EVA metric properly and not just in "name only." Therefore, we base our first sample on 57 U.S. firms that Stern Stewart & Company has posted on its website and where they report that these firms have achieved superior financial performance as a consequence of the adoption of EVA (1994-98).

The second sample is composed of 178 U.S. firms who mention EVA in their proxy statements as a part of the performance evaluation and compensation metric over the 1994-1999 periods[3]. Only Klieman (1999), an academic work, addresses the long-term EVA performance issue using stock market measures. Klieman identifies a sample of 71 firms that reported the adoption of EVA in their annual reports and 10-K during the 1987-1996 periods. He matches these EVA firms with a control sample based on industry (four-digit SIC code) and on size (measured in sales) a year before the year of adoption. He then uses abnormal returns and cumulative abnormal returns metric to conduct stock market performance tests. His study results show that the EVA firms significantly outperform their peers - they earn, over their peers, an industry-adjusted stock market total return of 28.8% over a four year period subsequent to EVA adoption. He concludes that long-run stock market performance of EVA adopters is significantly better than those of EVA non-adopters when compared to the peer firms. We feel that we make significant improvement to the research design employed by Klieman (1999) by not only matching EVA firms with the control firms on industry and on size but also on prior financial performance. We believe that matching firms on prior financial performance strengthens the research design.

Cordeiro and Kent, Jr. (2001) employ security analyst earnings forecasts as alternative to accounting and stock market performance measures. They test the relationship between adoption of EVA programs and analyst forecast of earnings per share. They use Stern Stewart list of 63 firms that adopted EVA and match these firms with 676 control sample firms matched by size, leverage, and by industry for the 1997 adoption year. They separately estimate three cross-sectional multiple regression models employing ordinary least squares (OLS) and using as dependent variables security analyst earnings per share forecasts of current-year, one-year-ahead and next five-year growth as measures of firm performance. Cordeiro and Kent, Jr. failed to find a link between EVA adoption and security analyst forecast of earnings per share. Our use of analysts forecast metric is different from the work of Cordeiro and Kent, Jr. in two specific ways: 1) They use security analyst forecast as a level variable, whereas, we use it as a change variable, and 2) They examine the statistical association between analysts forecast of EPS and adopters versus non-adopters of EVA sample at a point in time, whereas, we develop a measure that is a change in earnings forecasts following the adoption of EVA over a five-year forecast horizon. In our study's empirical results, we find no significant difference in long term stock price performance between EVA adopters and the control sample of firms matched on industry, size and past performance. We also find no evidence that financial analysts significantly revise their forecasts for the five-year growth of earnings per share for firms adopting EVA.

The rest of the paper is organized as follows: In the next section, we present the conceptual framework of EVA. We, next, describe sample selection and research design of the study. Following that, we report the results and finally, provide summary and conclusion of the study.

I. CONCEPTUAL FRAMEWORK OF EVA

Simply put, EVA is based on the centuries old financial concept that the true or economic profit of a firm must be based on the difference between all revenues or gains and all expenses or

[3] Most of the prior descriptive and empirical research examines periods that end in 1993.

losses that should include all the cost of borrowing from banks and other lenders and all the cost (opportunity cost) of "borrowing" from the owners (equity capital). Why is this issue so important? According to Drucker (1995) "until a business returns a profit that is greater than its cost of capital, it does not create wealth; it destroys it."[4] Since, a firm is not required by accounting rule-makers to deduct the estimated cost of equity "borrowing" on its income statement or disclose it in any section of the annual report, investors and other users have to estimate it themselves in order to arrive at this number. More importantly, the firms in the past have not been explicitly recognizing and accounting for this cost in a significant number of their internal decision making functions such as strategic planning, motivating, and performance evaluation. Rather, a case can be made that managers tend to perceive equity capital as free.

The modern theory of corporate finance postulates that managers' job is 'to maximize shareholder value, in turn maximizing the value of the firm.' The value of a firm is a function of its ability to generate future free cash flows. Based on a widely accepted discounted cash flow model (DCF), the discounted value of the expected free cash flows equals the value of the firm. Similarly, based on the EVA model, the value of the firm can also be calculated as the amount of capital invested, plus a premium equal to the present value of the value generated each year (Copeland et al. 2000). The two models and their formulations borrowed from extant finance literature (see more in Young (1999); Copeland et al. 2000) are reproduced herein:

DCF Model vs. EVA Model:

FCF = NOPAT – Change in capital
EVA = NOPAT – (WACC x Capital)
Enterprise value (DCF) = PV of future FCF
Or, = Beginning book capital + PV of future EVA

EVA Model, in general, is described as follows:

EVA = NOPAT + AcctAdj – Capital charge (based on AcctAdj. Of capital)
= NOPAT – (Invested capital x WACC)
EVA can also be defined as:
EVA = Invested capital x Spread
= Invested capital x (ROIC-WACC)
Where
NOPAT = Net operating profits after taxes
AcctAdj = Accounting adjustments
WACC = Weighted average cost of capital (debt cost + equity cost)
ROIC = Return on invested capital
Invested Capital = adjusted book value of net capital at the beginning of the period.

[4] Earlier research, Anthony (1982, 1973), strongly advocated that in reporting to outsiders the earnings for a period, a firm should also deduct the cost of equity interest, so as it does, the cost of debt from operations. This view is not new. The nineteenth century classical economist Alfred Marshall (1890) discussed the concept of an economic or real profit that is calculated after deducting all interest cost on invested capital from net profits. In the 1920s, Alfred Sloan introduced a residual income measure in General Motors and in the 1930s Matsushita also used it (Young, 1999). David Solomon in a 1965 monograph also proposed the use of residual income as an internal measure to structure performance evaluation contracts (Biddle et al, 1999). One related stream of research linked residual income to the value of a firm [Edwards and Bell 1961; Ohlson, 1995]. In academic circles, this approach is widely known as Edwads-Bell-Ohlson (EBO) valuation model.

Both models arrive at exactly the same firm value. However, the difference in EVA model compared to the DCF model is that EVA model provides a measure of the value added (in dollars) in a single year. A firm adds value if EVA calculation provides a positive dollar number (without a corresponding decline in future EVA's). On the other hand, the company destroys value if the EVA calculation results in a negative dollar number. It is important to note that EVA measures the addition to wealth. Therefore, the timing of wealth creation in the current period could be somewhat arbitrary. This is precisely why we need to examine the creation of wealth over a longer time horizon since the wealth creation starts occurring when positive NPV projects are selected (Copeland et al. 2000). Moreover, a criticism of EVA based compensation is that it encourages shortsightedness in managers, especially on the divisional level, as it rewards higher current earnings. Future loses will not penalize managers who expect to be promoted or leave the firm.

Stern Stewart & Co. recommends making 164 accounting adjustments to GAAP-based accounting. Consultants argue for no more than ten to twelve adjustments, in fact, some recommend no more than six as more than adequate (Young, 1999). The most commonly proposed GAAP-based accounting adjustments reported in Young (1999) are:

1. Non-recurring gains and losses.
2. Research and development.
3. Deferred taxes.
4. Provisions for warranties and debts.
5. LIFO reserves.
6. Goodwill.
7. Depreciation.
8. Operating leases

Companies can improve future EVA by taking some of the following actions (Young, 1999):

a. Decrease capital to lower the overall capital employed; this will increase ROIC only if NOPAT does not decrease more than the decrease in capital.
b. Increase investment only if the return on new investment is greater than the WACC.
c. Increase NOPAT without increasing capital investments.
d. Reduce WACC cost of capital.

II. SAMPLE SELECTION AND RESEARCH DESIGN

We use two samples to conduct the empirical analysis of our study. The first sample is based on 57 U.S. firms that Stern Stewart & Company has listed on its website and where they report that these firms have achieved superior financial performance as a consequence of the adoption of EVA for the 1994-98 periods. The second sample is based on 178 U.S. firms' proxy statements for the 1994-1999 periods[5] in which these firms have described EVA use as a part of their performance evaluation and compensation metric. We believe that the sample period is not an issue as the motivations on managerial behavior induced by EVA adoption should not be time specific. As a measure of performance and a basis for compensation, EVA is designed to

[5] Most of the prior descriptive and empirical research examines periods that end in 1993.

produce a specific focus on value creation that may be considered universal and; therefore, should not be expected to change over time.

The initial second sample was collected from the National Automated Accounting Research Service (NAARS) data tape obtained from the American Institute of Certified Public Accountants (AICPA) and Mead Data Control using the key words "EVA" or "Economic Value Added". We extracted the text from the Proxy Statements in which either of the above key words was mentioned. There were a total of 196 firms, which specifically mentioned EVA (or Economic Value Added) in their 1994-1999 Proxy statements, indicating that EVA is likely being used for management evaluation and compensation purposes. The following process was used to arrive at the final sample: 1) Only the earliest date was retained for those firms that mentioned EVA (or Economic Value Added) in more than one year in order to avoid multiple counting error, and 2) The firms were dropped if the price or analysts forecast information was were not available on the CRSP or I/B/E/S database, respectively for the sample period. The application of this screen resulted in a final sample of 178 firms (hereafter, Proxy sample) which then is used in the study.

III. Long Term Abnormal Returns

We examine the long-term stock performance of an EVA adopting firm relative to that of a matched firm over a specified holding period. We match each EVA adopting firm with a benchmark firm matched for the adopting firm's industry affiliation, size, and prior stock price performance. In addition to the obvious reasons for using industry affiliation and firm size, we use the prior stock price performance as one of the matching criteria because DeBondt and Thaler (1985, 1987), Fama and French (1988), Cutler, Poterba and Summers (1991), Jegadeesh and Titman (1993), Chan, Jegadeesh and Lakonishok (1996) and Barber and Lyon (1997) report evidence that future returns can be predicted using past returns;[6] and therefore, failing to control for it may lead to incorrect measurement of the post-announcement long-term abnormal return.

We first establish a list of non-adopting firms having the same industry affiliation as the EVA adopting firm which we determine by the two-digit Standard Industry Classification code of the adopting firm as indicated in the CRSP database. We then restrict the list to those non-adopting firms having market values within 20 percent of that of the adopting firm. We measure the total market value of the equity of the firms as of one month before the EVA adoption date. From this list of non-adopting firms, we select that firm whose prior stock price performance most closely matches that of the EVA adopting firm. Prior stock price performance is measured over one year before the EVA adoption date using the CRSP database.

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[6] Debondt and Thaler (1985, 1987) find that portfolios of long-term past losers outperform long-term past winners over the subsequent three to five years. Fama and French (1988) and Cutler, Poterba and Summers (1991) find a negative autocorrelation over horizons of three to five years. Jegadeesh and Titman (1993) report that (over an intermediate horizon of three to twelve months) past winners continue to outperform past losers. Chan, Jegadeesh and Lakonishok (1996) document the persistence, or momentum, of stock returns over the horizon of six months to a year. Also, using simulation for the period 1973 to 1994, Barber and Lyon (1997) show that for firms with high pre-event momentum; conventional *t*-tests are positively biased for the one-year horizon, and negatively biased for the three- and five- year horizons. For firms with low pre-event momentum, conventional *t*-tests are negatively biased for the one-year horizon, but positively biased for three-year horizon. The implication of the study of Barber and Lyon (1997) is that the post-announcement abnormal return might be caused by pre-announcement abnormal return, either explained by mean-reversion or under-reaction.

[6] We also performed the tests using monthly CARs and found similar results to those reported for the BHARs.

After matching the EVA adopting firms with non-adopting benchmark firms, we follow the prescription of Barber and Lyon (1997) and calculate the holding period abnormal return for a firm as:

$$BHAR_{(i,a,b)} = \prod_{t=a}^{b}(R_{it}+1) - \prod_{t=a}^{b}(R_{mt}+1)$$

where $BHAR_{(i,a,b)}$ is the buy-and-hold abnormal return for EVA adopting firm *i* over the holding period *a* to *b*, R_{it} is the return on stock *i* on day *t*, and R_{mt} is the return on the matched firm on day *t*.

We compute the buy-and-hold average abnormal returns (BHAAR) over holding periods that extend from one to five years. None of the buy-and-hold periods include the announcement day of the EVA adoption and the following trading day. If an adopting firm is de-listed before the end of a holding period, we still include its truncated return series in the analysis, and we assume that it earns the daily return of the benchmark firm during the remaining days in the holding period. We determine the statistical significance of each of the BHAARs using the parametric *t*-test (two-tailed) and the non-parametric Wilcoxon signed-rank test (two-tailed).[7]
If EVA adoption motivates managers at all levels of the firm to focus on value creation, the long term stock price performance of EVA adopters should be at least comparable to that of control firms. If EVA adoption increases the shortsightedness of managers, EVA adopting firms may underperform comparable firms. If firms that adopt EVA are better at creating shareholder value than comparable firms not adopting EVA, we should observe superior performance in the stock prices of EVA firms. The cumulative effect of EVA focused decisions should become increasingly manifest over time. Therefore, we examine long-term holding period returns for EVA firms and for comparable benchmark firms that are matched with the EVA firms in terms of industry, size, and prior performance.

IV. Estimating Analysts' Forecast Revisions

Monthly data on earnings forecasts made by analysts are obtained from the I/B/E/S database. We measure revisions of analysts' forecasts for the five-year growth rate of earnings around announcements of EVA adoptions. Specifically, the monthly forecast revision (FR) of the five-year growth rate of earnings for firm i in month t is calculated as:

$$FR_{i,t} = (F_{i,t} - F_{i,t-1}) / F_{i,t-1}$$

where Fi,t is the mean of analysts' forecasts for firm i at month t, Fi,t-1 is the mean of analysts' forecasts for firm i at month t-1 as reported by IBES. The monthly forecast revisions of the five-year forecast are normalized by the prior month's forecast. Average forecast revisions are calculated for each event month where month 0 is the EVA adoption month in event time. We determine the statistical significance of each of the average forecast revisions using the parametric *t*-test (two-tailed) and the non-parametric Wilcoxon signed-rank test (two-tailed).
Several studies provide evidence that analysts' earnings forecasts are superior to forecasts generated by time-series models. This forecasting advantage is partly attributed to their access to

[7] Barber and Lyon (1997) recommend using buy-and-hold abnormal returns. We also performed the tests using monthly CARs and found similar results to those reported for the BHARs.

private firm-specific information which in turn, helps them more aptly identify and isolate the permanent from the transitory and value-irrelevant earnings shock [Copeland and Mayers (1982); Brown and Zmijewski (1987); Ramakrishnan and Thomas (1991)]. Security analysts' main sources of information among other sources include frequent direct contacts with the top management of the firms they follow on a regular basis. Thus, security analysts frequently visit operational sites, query managers about their operational and strategic decisions, and closely monitor the ongoing developments around the firm. Consequently, they gain insight about firm's future prospects and then use this and other value relevant information to revise their forecasts of firm's earnings per share (Rao and Sivakumar, 1999). In fact, evidence in Imhoff & Lobo (1984) and Puffer & Weintrop (1991) indicate that analysts' forecasts serve as a proxy for expectations held by the board of directors.

Contemporary research argues that analysts' forecasts can be employed as a measure of performance of a firm. For example, Fried and Givoly (1982) provide evidence that analysts' forecasts are better than those of time-series models when used as proxy for market expectations. Brown et al. (1985) show that share price of a firm is driven by analysts' expectations of its future earnings. They also report that analysts' long-term earnings forecasts (e.g., a five-year earnings growth forecast) are 'more valuation-relevant than their short-term earnings expectations.' Similarly, Easton and Zmijewski (1989) report a positive relationship between the earnings response coefficient and the analyst's earnings revision coefficient. On similar lines, Givoly and Lakonishok (1979), Freeman and Tse (1989), and Beneish (1991) show that forecast revisions metric can be employed to predict future abnormal returns.

V. RESULTS

A. Long-term Holding Period Returns Test – Stern & Stewart Sample

TABLE 1

Holding-Period Abnormal Returns for EVA Firms identified by Stern Stewart

Average holding-period returns and average holding-period abnormal returns are reported for EVA firms and size/industry/performance matched benchmark firms. Holding-period abnormal return is the paired difference of the holding period returns for the EVA firm and its benchmark firm. Percent under-perform reports the percentage of EVA firms that under perform their benchmarks. *T*-statistics test the hypothesis that the average holding-period abnormal returns equals zero. The Wilcoxon Signed Rank Test is used to test the hypothesis that the percentage under-performance is equal to fifty percent.

HOLDING PERIOD	HOLDING PERIOD EVA FIRMS	ABNORMAL BENCHMARK	RETURN	T-STAT (P-VAL)	PERCENT UNDER-PERFORM	WILCOXON (P-VAL)	N
1 YEARS	28.614	24.509	4.105	0.51 (0.609)	35.7	(0.099)	56
2 YEARS	56.543	52.952	3.591	0.20 (0.840)	44.6	(0.234)	56
3 YEARS	65.878	117.477	-51.599	-1.13 (0.265)	51.8	(0.419)	56

* Significant at the 0.05 levels.

** Significant at the 0.01 levels.

Average holding period returns are reported for both sets of firms in Table 1 for holding periods of one, two and three years. Holding period abnormal returns are calculated as the pair-wise difference between the holding period return of the EVA firm and its benchmark firm. A positive average holding period abnormal return indicates that EVA firms outperform, on average, their non-EVA counterparts over the holding period. The t-statistics in the table indicate that the average holding period abnormal returns are not statistically different from zero in each of the three holding periods. Moreover, the results of Wilcoxon signed-rank tests for each of the holding periods show that the percentage of EVA firms under-performing their counterparts are not statistically different from 50 percent.

Table 1 reports the long-term holding period returns for the Stern & Stewart sample of 57 EVA firms and for comparable benchmark firms that are matched with the EVA firms in terms of industry, size, and prior performance. These Average holding period returns are reported for both sets of firms for holding periods of one, two and three years. Holding period abnormal returns are calculated as the pair-wise difference between the holding period return of the EVA firm and its benchmark firm. A positive average holding period abnormal return indicates that EVA firms outperform, on average, their non-EVA counterparts over the holding period.

As shown in Table 1, the t-statistics values indicate that the average holding period abnormal returns for EVA adopters and non-adopters are not statistically different from zero in each of the three holding periods. Moreover, the results of Wilcoxon signed-rank tests for each of the holding periods show that the percentage of EVA firms under-performing their counterparts are not statistically different from 50 percent. Therefore, we find no evidence that adopting of EVA results in better share price performance, as measured against comparable non-EVA adopting firms. Nor does the evidence indicate that EVA adopting firms underperform comparable non-EVA adopting firms. These results indicate that EVA firms and non-EVA firms give comparable attention to shareholder value creation.

B. Analysts long-term EPS Growth Forecast – Stern & Stewart Sample

TABLE 2

Average Forecast Revisions (AFR) for the Five Year Growth Forecast Horizon.

The forecast month is from the 3rd Thursday in one month to the 3rd Thursday in the following month relative to the event month 0. Forecast revisions for the current-year earnings are normalized by the price per share listed by the IBES the month prior to the announcement. Forecast revisions are cumulated over forecast months to calculate cumulative forecast revisions. The null hypothesis tested by the t-statistics is that the average FR equals 0.

Event: EVA Adopters - Stern & Stewart sample

Average Forecast Revision – Five Year growth

Forecast Month	Average Forecast Revision	T-Stat (P-Val)	Percent Pos/0/Neg	Wilcoxon T-Stat (P-Val)	N
-6	-0.00049	-0.08 (0.940)	24.5/49.1/26.4	0.10 (0.459)	53
-5	-0.00510	-0.70 (0.490)	20.4/50.0/29.6	0.84 (0.201)	54
-4	-0.00782	-1.33 (0.189)	20.0/50.9/29.1	0.53 (0.299)	55
-3	0.02804	1.49 (0.141)	30.9/52.7/16.4	1.89 (0.029)**	55
-2	0.00604	1.86 (0.068)	23.6/60.0/16.4	0.29 (0.385)	55
-1	0.00485	0.88 (0.383)	27.3/49.1/23.6	1.00 (0.159)	55
0	0.00057	0.08 (0.938)	19.6/51.8/28.6	1.12 (0.132)	56
1	-0.00111	-0.18 (0.856)	16.1/53.6/30.4	1.81 (0.035)**	56
2	-0.00075	-0.10 (0.921)	23.2/55.4/21.4	0.30 (0.381)	56
3	0.02013	1.08 (0.285)	28.6/50.0/21.4	0.80 (0.212)	56
4	-0.00012	-0.03 (0.979)	24.6/57.9/17.5	0.93 (0.175)	57
5	0.00215	0.29 (0.771)	21.1/54.4/24.6	0.12 (0.454)	57
6	-0.00291	-0.59 (0.560)	26.3/52.6/21.1	0.56 (0.288)	57

* Significant at the 0.05 levels.
** Significant at the 0.01 levels.

Table 2 shows the revision in monthly average analysts' forecasts of five-year growth in EPS for EVA adopters. These average forecast revisions are also provided for the +6 and -6 months around the event month (the month of the issuance of the Proxy Statement). The parametric t-statistic and the nonparametric (tests of proportions), p-value, is used to test whether the average forecasts revisions around the event date are positive and significantly different from zero for EVA adopting firms.

As shown in Table 2, we do not observe any significant positive revision made by analysts in their EPS forecasts of five-year time horizon. The results indicate that analysts do not perceive the adoption of EVA to be impacting the long term prospect of the firms.

C. Long-term Holding Period Returns Test – Proxy Statement Sample

TABLE 3

Holding-Period Abnormal Returns for EVA Firms
Proxy Sample

Average holding-period returns and average holding-period abnormal returns are reported for EVA firms and size/industry/performance matched benchmark firms. Holding-period abnormal return is the paired difference of the holding period returns for the EVA firm and its benchmark firm. Percent under-perform reports the percentage of EVA firms that under perform their benchmarks. *T*-statistics test the hypothesis that the average holding-period abnormal returns equals zero. The Wilcoxon Signed Rank Test is used to test the hypothesis that the percentage under-performance is equal to fifty percent.

HOLDING PERIOD	TARGET	PAIRED BENCHMARK	DIFFERENCE	UNDER- T-STAT (P-VAL)	PERCENT WILCOXON PERFORM	T-STAT (P-VAL)	N
1 YEARS	31.697	25.226	6.471	0.94 (0.348)	50.6	0.72 (0.237)	178
2 YEARS	23.719	13.955	9.764	1.32 (0.190)	49.4	0.66 (0.254)	178
3 YEARS	22.499	23.257	-0.759	-0.09 (0.930)	47.8	0.55 (0.292)	178

* Significant at the 0.05 levels.
** Significant at the 0.01 levels.

Average holding period returns are reported for both sets of firms in Table 1 for holding periods of one, two and three years. Holding period abnormal returns are calculated as the pair-wise difference between the holding period return of the EVA firm and its benchmark firm. A positive average holding period abnormal return indicates that EVA firms outperform, on average, their non-EVA counterparts over the holding period. The t-statistics in the table indicate that the average holding period abnormal returns are not statistically different from zero in each of the three holding periods. Moreover, the results of Wilcoxon signed-rank tests for each of the holding periods show that the percentage of EVA firms under-performing their counterparts are not statistically different from 50 percent.

Table 3 reports the long-term holding period returns for firms that disclosed the use of EVA in their proxy statements (Proxy sample) and for comparable benchmark firms that are matched with the EVA firms in terms of industry, size, and prior performance. These Average holding period returns are reported for both sets of firms for holding periods of one, two and three years. As reported in Table 1, the holding period abnormal returns are calculated as the pair-wise difference between the holding period return of the EVA firm and its benchmark firm. A positive (negative) average holding period abnormal return indicates that EVA firms outperform (underperform), on average, their non-EVA counterparts over the holding period.

As shown in Table 3, the t-statistics values indicate that the average holding period abnormal returns for EVA adopters (Proxy sample) and non-adopters are not statistically different from zero in each of the three holding periods. Moreover, the results of Wilcoxon signed-rank tests for each of the holding periods show that the percentage of EVA firms under-performing their counterparts are not statistically different from 50 percent. Therefore, we find no evidence that adopting of EVA results in better share price performance, as measured against comparable non-EVA adopting firms. Moreover, we find no evidence that EVA adoption induces greater shortsightedness as EVA adopters do not underperform, on average, non-EVA firms. These results indicate that EVA firms and non-EVA firms give comparable attention to shareholder value creation.

D. Analysts long-term EPS Growth Forecast – Proxy Statement Sample

TABLE 4

Average Forecast Revisions (AFR) for the Current-year Earnings Per Share – Five year growth.

The forecast month is from the 3rd Thursday in one month to the 3rd Thursday in the following month relative to the event month 0. Forecast revisions for the current-year earnings are normalized by the price per share listed by the IBES the month prior to the announcement. Forecast revisions are cumulated over forecast months to calculate cumulative forecast revisions. The null hypothesis tested by the t-statistics is that the average CFR equals 0.

Event: EVA Adopters – Proxy Sample

Average Forecast Revision – Five Year growth model

Forecast Month	Average Forecast Revision	T-Stat (P-Val)	Percent Pos/0/Neg	Wilcoxon T-Stat (P-Val)	N
-6	0.00870	1.62 (0.107)	23.8/59.4/16.8	0.25 (0.401)	143
-5	-0.01048	-1.88 (0.062)	14.2/60.1/25.7	2.29 (0.011)	148
-4	-0.06404	-1.84 (0.067)	21.3/60.7/18.0	0.41 (0.340)	150
-3	-0.00108	-0.35 (0.729)	17.0/67.3/15.7	0.97 (0.167)	153
-2	0.00602	1.67 (0.097)	25.5/58.8/15.7	1.80 (0.036)	153
-1	0.03284	1.68 (0.094)	21.8/53.2/25.0	0.72 (0.237)	156
0	-0.00423	-0.70 (0.484)	25.8/54.7/19.5	1.28 (0.101)	159
1	0.00282	0.64 (0.524)	21.7/54.8/23.6	0.48 (0.316)	157
2	-0.02153	-1.64 (0.104)	22.5/51.3/26.3	0.65 (0.258)	160
3	0.00352	1.23 (0.219)	20.3/59.5/20.3	0.41 (0.341)	158
4	0.00031	0.08 (0.938)	18.6/51.6/23.1	1.22 (0.112)	159
5	-0.00527	-1.26 (0.211)	23.1/58.3/18.6	0.61 (0.270)	156
6	0.00388	1.24 (0.217)	20.1/64.3/15.6	1.25 (0.106)	154

* Significant at the 0.05 levels.
** Significant at the 0.01 levels.

Table 4 shows the revision in monthly average analysts' forecasts of five-year growth in EPS for EVA adopters. These average forecast revisions are also provided for the +6 and -6 months around the event month (the month of the issuance of the Proxy Statement). The parametric t-statistic and the nonparametric (tests of proportions), p-value, is used to test whether the average forecasts revisions around the event date are positive and significantly different from zero for EVA adopting firms.

As shown in Table 2, we do not observe any significant positive revision made by analysts in their EPS forecasts of five-year time horizon. The results indicate that analysts do not perceive the adoption of EVA to be impacting the long term prospect of the firms.

VI. SUMMARY AND CONCLUSION

Our study examines EVA's link to long term shareholder value creation. We assume that EVA adoption motivates changes in managerial behavior that in turn affects long-term value creation.

Our study differs from past work on EVA in three distinct ways. First, unlike the prior research that primarily evaluates the relationship between firms' adoption of EVA and stock market performance only around the adoption date, our study provides evidence of EVA impact

over longer term stock market performance. Second, we do not have knowledge of any study that has directly examined EVA's effect on security analysts' forecasts of earnings per share (EPS) over a long-term horizon of five years. Our study focuses on how a firm's EVA adoption impacts financial analysts' consensus of growth of earnings per share for long-term forecast horizon. We believe that the cumulative effect of EVA focused decisions should increasingly manifest over time. If EVA's proponents' claims are valid then we expect to observe superior stock price performance and upward revisions of earnings per share forecasts by analysts over a longer period for EVA adopters.

Finally, unlike most prior research that uses only one sample, we employ two samples to conduct empirical analysis. The first sample is based on 57 U.S. firms that Stern Stewart & Company has posted on its website and where they claim that these firms have achieved superior financial performance as a consequence of the adoption of EVA for the 1994-98 periods. The second sample is based on 176 U.S. firms' proxy statements for the 1994-1999 periods in which these firms have described EVA use as a part of their performance evaluation and compensation metric.

Our study's empirical results, using both long-term holding period returns and analyst forecast based on five-year growth of earnings per share show that EVA adoption is not associated with superior long performance or expectations of superior performance for EVA adopting firms. The long run stock performance of EVA adopting firms is not significantly different from that of a control sample matched on industry, size and past performance. And financial analysts do not systematically revise their forecasts for the long term growth in earnings when firms adopt EVA. Thus, we did not find support for research that advocates adoption of EVA because it results in superior stock performance. However, these results should not be interpreted as indicating that EVA is not a useful tool for evaluating and rewarding performance as there is no evidence that EVA adopters underperform comparable firms. Moreover, it is also likely that firms who adopt EVA do so to benefit from market's positive perception about EVA. What our results do imply is that managers in both EVA and non-EVA firms are subject to internal monitoring and rewards and to the discipline of the external markets for corporate control and for managerial labor that induce a comparable focus in shareholder wealth creation in both sets of firms.

VII. Limitations and Further Research

Our study has some limitations that we should acknowledge. First, the use of NAARS database resulted in 310 hits. It is likely that some firms were inadvertently excluded when we used the search term EVA or Economic Value added. For instance, some firms might be using the term "Controllable Earnings" or "Economic Profits" to mean the same thing. We do not feel that the inclusion of a few more firms could affect the results of our study. Second, we did not include the time period before the year 1994 and after the year 1999. We are confident that a six-year span (especially, the period that combines both slow growth and an economic boom) is sufficient to address the research questions posed in the study.

A number of sample firms stated that the recent evidence in the financial press of a positive correlation between changes in EVA and market value of common stock was what motivated them to formally adopt EVA. Since, quite a few firms have also combined the application of

EVA with other measures of performance; future research can identify the differential value of these metrics by correlating them to the stock returns. Another interesting future research avenue would be the extension of the EVA focus to multiple measures as advocated by the Balanced-Scorecard proponents. As such one would explore companies' external financial reporting mechanisms to identify future trends in financial and non-financial management measures (including EVA) that are used in building the Balanced Scorecard.

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