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Do EVA™ Adopters Outperform their Industry Peers? Evidence from Security Analyst Earnings Forecasts

James J. Cordeiro and D. Donald Kent, Jr.

INTRODUCTION

Economic-value-added (EVA™)¹, developed by the consulting firm of Stern Stewart & Co. is a corporate financial performance measurement and management system which has grown in popularity both within and outside the United States in the 1990s.² Prominent corporate and journalistic supporters of EVA™, *Fortune* magazine in particular, laud it as the holy grail of corporate performance management and measurement. Many authors, however, point to the shortcomings and implementation concerns of EVA™ (Brewer, Chandra, and Hock, 1999; Bowen and Wallace, 1999; Chen and Dodd, 1997; Delves, 1999; Dodd and Johns, 1999) or view it merely as a variation of the older accounting concept of residual income (Dodd and Johns, 1999).

There has been a growing literature examining the effectiveness of EVA™ adoption. However, this has been mainly in the form of case studies and reports that document the improved financial performance resulting from EVA™ adoption at individual firms (see e.g., Grant, 1997, Ehrbar, 1998). To date, there is little systematic evidence on the effect of EVA™ adoption across larger samples of firms. A notable exception is an in-house study reported upon by Ehrbar, 1999, and by Stern Stewart and Co. on their corporate web site (www.sternstewart.com). Comparing sixty-seven adopters of the EVA™ system with their peers, matched on industry and size, Stern Stewart reports that the adopters outperformed the non-adopter peers in terms of stock returns over a period up to five years after adoption. Closer

examination of these findings however, reveals that in any given year following adoption, between 34-50% of EVA™ adopters underperform their peers. Thus, for a given firm, it is not clear that the adoption of EVA™ comes even close to guaranteeing performance improvements.

The purpose of the present study is to re-examine the link between EVA™ adoption and firm performance, using security analyst earnings forecasts. These forecasts, we argue, function as a proxy for firm performance that usefully supplements other accounting and stock market measures. We begin by reviewing some of the literature on EVA™, noting claims for strengths and weaknesses of that performance measure and management system. We then make the case for why security analyst earnings forecasts are a useful performance measure for testing the performance effects of EVA™ adoption. We test our hypothesis using Stern Stewart's sample of firms in 1997.

THEORETICAL BACKGROUND

Background on EVA™

EVA™ is defined as the excess of the dollar amount of net operating profit after tax (NOPAT) over the dollar charge for capital (both debt and equity) obtained by multiplying the percentage weighted-average cost of capital (WACC). This arguably approximates economic performance better than traditional accounting measures such as return on assets since it measures the dollar return in a given

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year above the minimum rate required to compensate investors for risk on capital investments. The EVA™ system marketed by Stern Stewart makes a number of “equity adjustments” that transform accounting book value into a more accurate measure of at-risk cash called economic book value as part of the EVA™ calculation. It is important to note that EVA™ is more than just a performance measurement system. It is also marketed as a motivational, compensation-based management system that facilitates economic activity and accountability at all levels in the firm.

Stern Stewart (1999) reports that companies that have adopted EVA™ have outperformed their competitors when compared on the basis of comparable market capitalization. Several advantages claimed for EVA™ are:

- ▶ EVA™ eliminates economic distortions of GAAP to focus decisions on real economic results
- ▶ EVA™ provides for better assessment of decisions that affect the balance sheet and income statement or tradeoffs between each through the use of the capital charge against NOPAT
- ▶ EVA™ decouples bonus plans from budgetary targets
- ▶ EVA™ covers all aspects of the managerial cycle
- ▶ EVA™ aligns and speeds decision making, and enhances communication and teamwork

Academic researchers have argued for the following additional benefits:

- ▶ goal congruence of managerial and shareholder goals achieved by tying compensation of managers and other employees to EVA™ measures (Dierks & Patel, 1997)
- ▶ better goal congruence than ROI (Brewer, Chandra, & Hock, 1999)
- ▶ transformation of employees into entrepreneurs via incentive-compensation plans
- ▶ annual performance measured tied to executive compensation
- ▶ provision of correct incentives for capital allocations (Booth, 1997)
- ▶ long-term performance that is not compromised in favor of short-term results (Booth, 1997)
- ▶ improvement in corporate environmental performance (Epstein & Young, 1998)
- ▶ provision of significant information value beyond traditional accounting measures

of EPS, ROA and ROE (Chen & Dodd, 1997)

EVA™ also has its critics. Brewer, Chandra, & Hock (1999) cite the following limitations to EVA™:

- ▶ EVA™ does not control for size differences across plants or divisions
- ▶ EVA™ is based on financial accounting methods that can be manipulated by managers
- ▶ EVA™ may focus on immediate results which diminishes innovation
- ▶ EVA™ provides information that is obvious but offers no solutions in much the same way as historical financial statements do

Brewer et al (1999) recommend using other performance measures along with EVA™ and suggest the balanced scorecard system. Other researchers have noted that EVA™ does not correlate as strongly with stock returns as its proponents claim. Chen and Dodd (1997) reported a high correlation between stock returns and EVA™ variables, but that only 20% of the variation in stock return could be explained by average EVA™ per share and none of the other variables tested accounted for more than 26% of that variation. They also found that, while EVA™ provides significant information value, other accounting profit measures also provide significant information and should not be discarded in favor of EVA™ alone. Biddle, Bowen & Wallace (1997) found only marginal information content beyond earnings and suggest a greater association of earnings with returns and firm values than EVA™, residual income, or cash flow from operations.

In a survey of top management with accounting responsibilities, Dodd and Johns (1999) found a difference in usage of nonfinancial measures between EVA™ adopters and non-adopters. They suggest that EVA™ adopters are de-emphasizing measures of effectiveness (quality) and adaptability (customer satisfaction) (ibid. p.17). They also point out that this trend toward remote management by financial numbers alone is occurring perhaps without companies even knowing it and that using a single financial measure of corporate performance is inappropriate for today’s environment.

Finally, a key criticism of EVA™ is that it is simply a retreaded model of residual income and that the large number of “equity adjustments” incorporated in the Stern Stewart system may not be necessary (Barfield, 1998; Chen & Dodd, 1997; O’Hanlon & Peasnell, 1998; Young, 1997). The similarity between EVA™ and residual income is supported by Chen and Dodd (1997) who note that most of the EVA™ and

residual income variables are highly correlated and are almost identical in terms of association to stock return.

Managers in firms that are thinking about adopting EVA™ will reasonably want to know whether it is merely a fad or has long-term performance improvement advantages. On balance, it is hard, *a priori*, to predict whether the benefits of EVA™ adoption will outweigh the disadvantages and implementation issues. Other than a number of single-firm or industry field studies (see, for example, McLaren, 1999), the major publicly-available large-sample evidence on the evidence of EVA™ adoption on firm performance is an in-house study conducted by Stern Stewart and Company which analyzed total returns to shareholders for up to five years from the month that the firms adopted the system. Stern Stewart reports that, on average, the adopters outperformed competitors with similar market capitalization by 8.55 percentage points a year, or a total of 50.7 percentage points of return over five years. A closer reading of their findings, however, indicate that it is also true that for the first year of adoption 23 out of 67 adopters underperformed their competitors. The corresponding figures for years two, three, four, and five were 28 out of 56, 19 out of 43, 14 out of 29, 6 out of 15. In terms of the compound rate over the entire five-year period, 23 of 67 adopters underperformed their competitors. Clearly, then, while a *portfolio* of adopters may outperform their competitors, based on the data above, it is much harder to make the case that *any given adopter* of the EVA™ system will outperform its competitors given the 34-50% of adopters that underperform their competitors in any given year following adoption.

Given this situation, we re-investigate the relationship between EVA™ adoption and firm performance. In the section below we make the case for the use of security analyst earnings forecasts as an important alternative performance measure of firm performance.

Industry security analyst earnings forecasts as a supplement to traditional performance measures

Historical firm performance measured alternatively using stock market returns and accounting performance measures such as return on assets (ROA), return on equity (ROE), return on sales (ROS), or earnings-per-share has traditionally been used as an index of firm performance. A strong case can be made, however, that historical accounting performance is an *incomplete* measure of firm performance (for example Sloan, 1991; Cordeiro & Sarkis, 1997, Cordeiro & Sambharya, 1997).

Historical *accounting performance measures* such as ROA, ROE, ROS and earnings-per-share measures are deficient because they are unidimensional and thus

unsuited to fully assessing firms' strategic outcomes and performance (Dalton *et al*, 1982; Ford and Schellenberg, 1982; Ventraman and Ramanujam, 1986). They are also retrospective in that they reflect only past performance and not future performance. Moreover, longterm averages of past accounting performance tend to suffer from increased noise-to-informativeness ratios. Accounting performance measures also ignore differences in risk-taking between firms in their quest for profits. Managers may also manipulate reported accounting profits to their advantage, (for example to boost management compensation (Schipper, 1989)) and by choosing alternative accounting procedures within the GAAP framework (McGuire *et al*, 1986; Gomez-Mejia *et al*, 1987). Some popular techniques involve switching between inventory policies, switching depreciation methods, and expense pension fund allocation. Finally, idiosyncratic industry-and country-specific practices limit the comparability of accounting performance measures across different product and country markets.

Because of the limitations reviewed above, *stock market performance measures* such as raw or risk-adjusted stock returns and ratios of market value to book value of equity are often used to supplement or replace accounting performance indicators. These measures are based on stockholders' current expectations of future performance-specifically the discounted value of future cash flows accruing to the corporation. The discount rate used in this discounting is 'risk-adjusted' in that it appropriately considers the level of risk associated with the firm's ventures.

Unfortunately, stock market measures are also subject to important limitations. Firstly, they are 'noisy' since they are influenced by market-or economy-wide forces (such as recessions, energy price hikes) that are well beyond management control. Secondly, information asymmetry (namely cases where managers are privy to information that is not available to the stockholders), may result in stock market performance measures being incomplete indices of future performance expectations since in efficient markets, prices only reflect information that is available to market participants. Such information asymmetry might be present, for example, in situations where management is reluctant to divulge details or even the existence of a proprietary new product for fear of competitor response. If stockholders are not privy to information about this new product, they cannot be expected to factor in its value in boosting future cash flows. Consequently, the stock price will not reflect the value associated with the new product.

Industry security analyst earnings forecasts of future accounting performance (typically earnings-per share) draw on detailed ongoing information-

gathering and analysis of management decisions and firm activities to reduce the information asymmetry between the firm's managers and its stakeholders. These analysts typically specialize in a few firms or industries and diligently gather various information – ranging from corporate annual reports to plant visits to trade associations to specialized management presentations – to develop and disseminate their forecasts of earnings performance (Sambharya, 1995). This valuable ongoing monitoring function enhances market efficiency (Moyer *et al*, 1989; O'Brien, 1990).

As Sambharya (1995) points out, analysts' forecasts incorporate the analysts' view of the firm's history, strategy, its standing in the industry, its interactions with various stakeholders, and especially important for our purposes, the expected impact of the firms intended strategies. These features underscore the validity of earnings forecasts as firm performance measures.

Empirical testing demonstrates that analysts' earnings forecasts are valuable to investors because they can be used to supplement the signals of future performance inherent in stock prices and returns (Givoly and Lakonishok, 1980). Marston *et al* (1988) report that analyst forecasts provide reasonable risk and return estimates consistent with the predictions of finance theory, while Imhoff (1983) and Moses (1991) find that changes in consensus earnings forecasts are positively related to changes in stock prices and to cash flow.

Unlike retrospective historical accounting performance measures used in past compensation research, industry analysts' earnings forecasts have significant value as *prospective* indicators of future earnings performance. Fried and Givoly (1982), and most recently, Brown (1993) reported that analysts' forecasts are superior surrogate for market expectations than time-series models. It is also worth pointing out that earnings-per-share forecasts are less subject to economy-wide influences than stock market performance measures.

The features reviewed above make analysts' earnings forecasts a useful addition to traditional accounting and stock market performance measures in models that seek to identify the CEOs contribution to firm value. Research by Imhoff and Lobo (1984) and Puffer and Weintrop (1991) supports the view that analysts' forecasts may proxy for director expectations about future firm performance. This is reinforced by Chen *et al* (1993) findings that within the airline industry, analysts forecasts were the most accurate and reliable source of information relative to other information sources such as industry participants, academics and consultants. Recently, Cordeiro & Sarkis (1997), and Cordeiro & Sambharya (1997) have used security analyst earnings forecasts as measures of performance when investigating the impact of

corporate environmental proactivism and corporate reputation respectively. We follow in this tradition by examining the impact of EVA™ adoption on security analyst earnings forecasts.

METHODS

The 67 adopters of EVA™ programs were identified from the 1999 Stern Stewart report titled *The Superior Stock Market Performance of Stern Stewart Clients*. These were the same firms used in the Stern Stewart stock market performance study. Stern Stewart indicates that its only U.S. clients excluded from the study were those with less than 12 months of data, a few companies that decided not to adopt EVA™ after beginning their implementations, and ones that were acquired by other companies either before or shortly after they completed their EVA™ implementations. Using the CD-Disclosure database for 1997, which provides financial data on all U.S. firms filing with the SEC, we identified all companies in the 4-digit SIC codes in which these adopters primarily did business and screened them to ensure that they had at least \$100 million in sales, and to ensure that there were no missing values on the variables used in the study. Our final sample comprised 739 firms in total, of which 63 were EVA™ adopters. Four adopters were dropped due to missing data. The variable *EVA™-Adopter* is a dummy variable with value 1 if the firm adopted EVA™ and 0 otherwise.

All other measures were obtained from the CD-Disclosure database for August 1997 which reports on prior financial data and provides security analyst earnings forecasts for future periods. Three measures of security analyst earnings-per-share (eps) forecasts were used: (a) *end-of-current year eps forecast* (i.e. for year-end 1997), (b) *next-year end eps forecast* (i.e. for year-end 1998) and, (c) *next 5-year earnings-per-share growth forecast (in %)* (i.e. over 1997-2001). These eps forecasts are provided to CD-Disclosure by I/B/E/S.

Controls for *firm size* (operationalized as the log of sales to reduce heteroscedasticity), *firm financial leverage* (operationalized as long-term debt to equity ratio), *past five-year summary eps*, *number of analysts making forecasts* and the *industry-average eps performance measure* were used based on earlier research that has used security analyst earnings forecasts as dependent variables (Cordeiro & Sarkis, 1997; Cordeiro & Sambharya, 1997). The industry-average measure was computed separately for each of the three security analyst earnings per share forecasts used (separately) as the dependent variable in the multiple regression analyses below.

The means and standard deviations are presented in Table 1.

The following multiple regression model is estimated separately using ordinary least squares

TABLE 1
Descriptive Statistics

Variable	Mean	Standard Deviation
EVA™ Adopter (Yes = 1; No =0)	.051	.22
Market-to-Book Ratio	0.54	0.79
Sales	1459049	0026652
Long-term Debt to Equity Ratio (%)	17.4	11.87
Number of Analysts following Firm	6.22	7.84
Next 5-year earnings-per-share growth forecast (%)	8.68	9.3
End of year earnings-per-share forecast	1.35	1.58
Next-year earnings-per-share forecast	1.51	1.77
Past five-years summary earnings-per-share	2.35	6.66

(n = 1313)

(OLS) for each of the three operationalizations of the security analyst earnings forecast measure:

$$\text{Security analyst earnings forecast} = a + b1 \text{ EVA}^{\text{TM}} \text{ adopter dummy} + b2 \text{ Firm size} + b3 \text{ Firm financial leverage} + b4 \text{ Past five-year summary eps} + b5 \text{ Number of analysts making forecasts} + b6 \text{ Industry-average eps performance measure} + \text{error}$$

The results of the multiple regression analyses are provided in Table 2. Regression diagnostics revealed no problems with multicollinearity or heteroscedasticity or distribution of residuals.

Each of the regression models explains between 39-52% of the variance in the security analyst earnings forecast. The F-values are also significant at the .000 level. The year-end and next year-end security analyst earnings forecasts appear to be significantly positively related to firm size, the number of analysts following

the firm, the past five-year eps and the industry average forecast, while the next 5-year eps growth forecast is negatively related to firm size, and positively related to the number of analysts following the firm, and the industry average forecast only. Our research hypothesis, however, was not supported for either one of the three security analyst earnings forecast measures.

DISCUSSION AND CONCLUSIONS

This study attempted to test the effectiveness of adoption of EVA™ programs on firm performance where performance is measured using security analyst earnings forecasts. Although our results are subject to the limitations noted below, we believe that this is an important advance in the academic literature, especially given our careful controls for analyst following, firm size, leverage and industry effects.

Our finding of no significant relationship between EVA™ adoption and security analyst forecasts of future firm eps performance is somewhat surprising in that these forecasts would be expected to be correlated with investor appraisals in the stock market, consistent with the past research cited in the analyst forecast literature above.

One potential confounding factor is that other firms within the EVA™-adopter's industry may adopt other residual income management programs similar to EVA™. If these other programs also improve their performance, this would bias the probability of our finding significant results downwards.

Another interesting possible explanation has to do with the fact that EVA™ measures are biased against firms with up-front capital commitments for future

TABLE 2
Multiple Regression Analyses

	EPS Performance Measure (Dependent Variables)		
	End-of-year eps forecast	End-of-next-year eps forecast	Next five-year eps growth forecast
EVA™ Adopter Dummy (1=Yes; 0 = No)	.008 (.27)	.011 (.36)	-.038 (-1.48)
Firm Size (Ln of Sales)	.179 (4.52)***	.184 (4.58)***	-.31 (-9.16)***
Firm Financial Leverage (Long-term Debt to Equity)	-.008 (-.27)	-.02 (-.52)	.038 (1.50)
Past five-years summary eps	.153 (4.76)***	.143 (4.41)***	-.007 (-2.49)
Number of analysts making forecasts	.155 (3.99)***	.164 (4.18)***	.133 (4.12)***
Relevant Industry Average eps performance measure	.405 (13.14)***	.388 (12.45)***	.638 (24.64)***
<i>Adjusted R²</i>	0.32	0.30	0.52
<i>F-statistic</i>	57.92***	54.69***	132.89***

growth prospects (since these firms will take a while to recoup their capital costs). In these firms therefore, the impact of EVA™ adoption on anticipated eps forecasts may not be as positive or significant as on stock market expectations, which look not just at one or five-year performance expectations but the entire stream of future periods. Building on the findings in this research, we are currently investigating the differential impact of EVA™ adoption on security analyst earnings forecasts when moderated by the firm's investment opportunity set and other contingency factors.

It is reasonable to assume that EVA™ adoption may not be suitable for all firms all the time. Bowen and Wallace (1999), Delves (1999), and McLaren (1999), for example, highlight a number of firm-

specific contingencies that may make a difference in EVA™ system's ability to improve performance. These include industry factors such as capital intensity and growth rate of the firm, business factors such as the firm's strategic goals and drivers, management power and style, and buy-in, understanding and accountability of its employees. Future research may usefully focus on these factors in unearthing more complex relationships between EVA™ adoption and performance.

There is a considerable and growing amount of press and management attention as well as stockholder money tied up in EVA™ programs in U.S. firms. Given this investment, research that investigates the performance implications of such programs should thrive well into the foreseeable future.

NOTES

- ¹ EVA™ is a registered trademark of Stern Stewart & Co.
- ² "EVA: The Real Key to Creating Wealth" by Al Ehrbar, Wiley, 1998, provides a good overview of EVA™ as do Ehrbar, 1999, and Diercks and Patel, 1997

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