The Economic Value Added (EVA®): An Analysis of Market Reaction.

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Abstract

Using different event case study methodologies and test statistics we test the market reaction to the introduction of the Economic Value Added (EVA®[1]) management technique. Additionally we also analyze the effects over the main company variables, looking at the evolution before and after EVA® adoption of three sets of company variables: profitability, investment and cash flow variables. We first observe that the EVA® introduction does not generate significant abnormal returns, either positive or negative. In other words, the market does not appear to react to EVA® adoption. Next, our analysis shows that firms adopt EVA® after a long period of bad performance, and performance indicators improve only in the long run after EVA® adoption. With respect to the investment variables, we observe that EVA® adoption provides incentives for the managers to increase firm investment activity, and this appears to be linked to higher levels of debt. Finally, we can observe that the EVA® adoption affects positively and significantly cash flow measures. We test if this positive relation between EVA® adoption and cash flow measures can be due to the fact that such measures affect directly part of managerial compensation, but we do not obtain definitive robust results.

[1] The abbreviation EVA is a trademark of Stern Stewart & Company.

The Economic Value Added (EVA®): An Analysis of Market Reaction.

Introduction

The Economic Value Added is a management technique developed by the Stern Stewart & Company consultant group (Stern, 1985; Stewart, 1991; Stern, Stewart and Chew, 1995). Basically, the technique provides a way to compute the economic value created by the firm over a period of time, the key variable which should guide managerial decision making (Bromwich and Walker, 1998; Chen and Dodd, 1997).

The Economic Value Added of a firm can be defined as the change in the NOPAT (Net Operating Profit after Taxes) minus the change in the Cost of the Capital used to generate this NOPAT (Rappaport, 1986, 1998). Thus, EVA® depends basically on the firm operating profit, taxes, debt level, and the cost of capital.

This management technique appears in the 80s, but it is in the 90s when it spreads widely among firms. The EVA® technique has been adopted by important firms such as Coca Cola, DuPont, Eli Lilly, Polaroid, Pharmacia (former Monsanto), and Whirlpool. If we analyze the EVA® citations in both academic and practitioner publications (Biddle, Bowen and Wallace, 1997; Brickley, Smith and Zimmerman, 1997), we can observe that EVA® is nowadays one of the most important and relevant management techniques.

The interaction of two important facts can explain the development and diffusion of EVA®. First, in the 80s an interesting debate develops about the firm performance measures provided by the accounting procedures (Kaplan, 1983, 1984). The debate arises from the fact that traditional accounting methods are highly tied to the subjective opinion of the accountant (i.e., FIFO vs LIFO, depreciation methodology), and this appears to be especially important in the analysis of profitability. As a consequence, managers can easily manipulate accounting performance measures (Dyl, 1989; Gomez-Mejía and Balkin, 1992; Hunt, 1985; Jensen & Murphy, 1990; Verrecchia, 1986). These facts imply that accounting measures used for years by shareholders to control and guide their investment decisions are quite inefficient.

Second, in the 80s important economic and social aspects affect American firms. In the first part of the decade American firms experience tough competition from Japanese firms (Kaplan, 1983). At the same time, financial markets internationalize and experience a huge expansion. These facts increased the need for shareholders and

investors of new firm performance measures, objective and not manipulable. In this context, and in order to satisfy this need, Stern Stewart & Company developed the EVA® technique.

The EVA® technique assumes that firm economic value added is the best indicator of creation of shareholder value, and thus, must be the variable used by managers to take any decision. Furthermore, it is necessary to provide incentives for managers to use EVA® as their key variable in the decision making process. Following standard agency-theoretic considerations, this can be done linking part of the managerial compensation to EVA®.

Despite all the positive rhetoric surrounding the EVA® technique, and all the positive aspects emphasized by Stern Stewart and Co. and other defenders (O'Byrne, 1997; Stewart, 1991, and Stewart, 1994; Tully, 1993, 1994, 1998, 1999; Walbert, 1994; see also www.sternstewart.com), there are several studies questioning the efficiency of this management technique, from several points of view (see Biddle, Bowen and Wallace, 1997; Chen and Dodd, 2001; Fernandez, 2001; Haspeslagh, Noda and Boulos, 2001; Wallace, 1997).

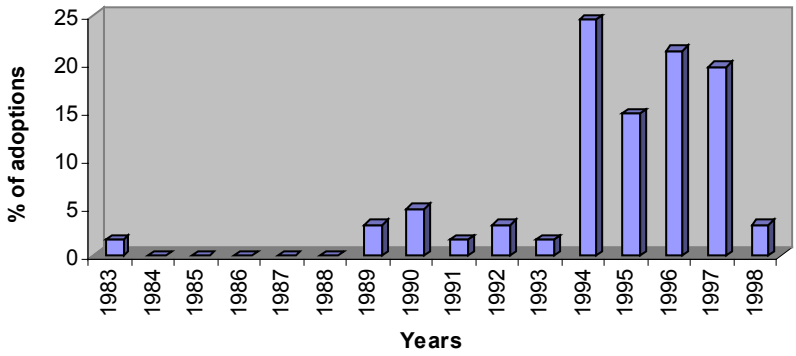
In particular there is a large literature analyzing the EVA® information content (Biddle, Bowen and Wallace, 1997; Chen and Dodd, 2001; Clinton and Chen, 1998), and its correlation with Market Value Added (Fernandez, 2001; Kramer and Pushner, 1997; Riceman, Cahan and Lal, 2000; Walbert, 1994). The results are mixed. However, these studies do not analyze the stock market reaction when the firm introduces the EVA® technique, or how their key variables evolve.

To fill this gap our paper adopts an event study methodology to analyze the market reaction after a firm adopts the EVA® technique. We consider a sample of 61 firms that adopt the EVA® technique during the period 1983 to 1998. If EVA® improves managerial decisions, we should expect a positive market reaction after the adoption.

In order to obtain robust results, we use different event study methodologies and test statistics. We find that on average a firm does not experience significant abnormal reactions, either positive or negative, prior or after EVA® adoption. The result appears to be in conflict with Stern Stewart & Co. communications and other studies (O'Byrne, 1997, Walbert, 1994), observing that companies that apply the EVA® technique present high levels of stock market returns. This is probably due to the fact that the explosion of the EVA® technique occurs in the middle and the second part of the 90s (see Figure 1),

a period characterized by a strong stock market. Probably, the positive stock market evolution observed by Stern Stewart and Co. and other defenders in EVA®' firms can be attributed to the stock market tendency and not to the EVA® properties.

Figure 1. *Adoption Timing.*



Additionally, revising the EVA® literature we also can find that EVA® defenders claim that EVA® helps to improve operating profits, the cost of capital and the investment activity (Prober, 2000; Stewart, 1991). Thus, in order to test this claim, and in order to analyze how the EVA® companies profile evolve, we will also analyze the evolution, before and after the EVA® adoption, of three sets of firm variables: performance measures, investment activity indicators, and cash flow measures.

We analyze two different firm performance variables, an accounting based measure (Return on Assets), and a market based measure (Annual Average Monthly Market Return). The analysis of this set of variables reveals that companies adopt the EVA® technique after a long period of declining firm performance. After the adoption we can observe that these measures do not improve in the short run, but only (and sometimes not very significantly) in the long run.

We also analyze a set of variables that measure company investment activity (Price to Book ratio, Tobin-q ratio, Debt to Assets ratio, the R&D Expenses to Sales ratio, and the Total Assets item). This analysis indicates an increase in company investment activity after the EVA® adoption. This coincides with higher levels of debt, indicating that the increment in investment is probably financed through debt.

Finally, since EVA® increases the importance of cash flow versus other accounting variables, we also analyze two cash flow variables (Cash Flow Margin and the EBIDTA Margin). In this final study we observe that EVA® companies experience significant cash flows increments after the EVA® adoption.

We can conclude that EVA® technique does not beat accounting and market firm performance measures in the short run, but only (and not very significantly) in the long run. Additionally, EVA® technique seems to provide incentives to the managers to increase company investment activity. The analysis of company cash flows reveals that, after EVA® adoption, firms experience important increments in cash flow measures. This can be due to the fact that EVA® technique compute the economic value of the firm, based on firm cash flows. At the same time, sometimes EVA® firms link part of managerial compensation to this measure (Wallace, 1997). Thus, managers have strong incentives to increase firm's cash flows, since they know that the variable directly affects their employment risk and compensation.

In order to test this hypothesis we divide the sample in two groups. The first group comprises those firms that introduce the EVA® technique both as a management technique and as a variable for the determination of managerial compensation. The other group is made up by those firm which only introduce EVA® as a management technique. We do not observer significant differences between both groups. Additionally the small size of the groups makes it difficult to provide definitive robust conclusions.

The paper is organized as follows. In the first part we analyze the most important characteristics and properties of the EVA® methodology. In the second part of the paper we describe the sample and methodology used in both analysis. The next two sections expose the results obtained in the event study, and in the company analysis profile before and after the EVA® adoption, respectively. Finally we summarize the main conclusions.

The Economic Value Added (EVA®) technique

EVA® can be defined as the firm operating profit after taxes (NOPAT), less the cost of capital. EVA® proponents assume that any increment in the firm EVA® increases the value of the firm, since the profits are higher than the cost of the capital

needed to generate such profits (Bromwich and Walker, 1998; Chen and Dodd, 1997; Ray, 2001), and this must be reflected in the stock price. From the operational point of view we have (Biddle et al., 1997; Fernandez, 2001; Rappaport, 1998):

$$EVA® =$$
$$= [\text{NOPAT} - (\text{D} + \text{Ebv})\text{x}(\text{WACC})] =$$

Where NOPAT is,

$$\text{NOPAT} = \text{EBEI} + \text{ATInt}$$

Where:

- NOPAT: Net Operating Profits After Taxes.
- D: Debt
- Ebv: Equity Book Value.
- WACC: Weighted Average Cost of Capital.
- EBEI: Earnings Before Extraordinary Items.
- ATInt: After Taxes Cost of Interest Expense.

Thus, we can define the change in EVA® as,

$$\Delta EVA® =$$
$$= \Delta [\text{NOPAT} - (\text{D} + \text{Ebv})\text{x}(\text{WACC})]$$

Thus we see that EVA® relies on an old idea: only when the return on the capital is higher than its cost we are creating value for the firm.

The information needed to compute EVA® is obtained mainly from accounting data. However, accounting information has to go through some adjustments. Some of these adjustments are to add back deferred tax reserves and bad debt reserves, goodwill amortization, and LIFO reserve increase (Prober, 2000; Rappaport, 1998). These adjustments are made to avoid the "distortions" that accounting information presents, and in order to get a better approximation of firm cash flows (Stewart, 1994). Basically, the EVA® methodology uses modifications of GAAP earnings in addition to a capital charge (Wallace, 1997).

As we mentioned before, EVA® may serve two purposes. It is used as a technique for making investment decisions and it is used in managerial incentive compensation systems (Haspeslagh, Noda and Boulos, 2001; Pettit and Ahmad, 2000; Riceman, Cahan and Lal, 2000; Wallace, 1997). As we will see later, usually firms first adopt the EVA® management technique and later (and not always) introduce EVA® in the incentive compensation system. However, most firms only use EVA® for decision making, rather than as an incentive compensation system (Ittner and Larcker, 1998).

Controversy in EVA® literature

Analyzing the EVA® literature we can find mixed results. On one hand there is a literature, appeared on academic and practitioners' journals, trying to show that EVA® increases shareholders wealth (Petit, 2000; Stewart, 1991, 1994; Stern, Stewart & Chew, 1995; see also: www.sternstewart.com). In this line we can find studies that observe a positive and significant correlation between EVA® and Market Value Added (Walbert, 1994), and shareholder returns (O'Byrne, 1997). The popular press has also devoted a some attention to the positive properties of EVA® (e.g., Davies, 1996; Tully, 1993, 1994, 1998, 1999; Walbert, 1993).

However, as several authors point out (Chen and Dodd, 2001; Ray, 2001), in most of the cases these papers only expose anecdotal stories about the spectacular stock price evolution of EVA® firms after the EVA® adoption, but only find poor significant relationship between EVA® and firm performance measures.

On the other hand, we also can find theoretical arguments and empirical evidence questioning the properties of EVA®. The main issue is whether EVA® is a

really efficient management technique that will last for years, or if it is only another management fashion that will fade away with time, as it was the case with ABC and TQM. In this sense, Brickley, Smith and Zimmerman (1997), analyzing the most important management fashions appeared in the last years, catalog the EVA® as another management fashion. O'Halon & Peasnell (1998) discuss the main characteristics of the EVA®, but at the same time question their utility, and posit that we will have to wait some time to evaluate if EVA® is a really efficient management technique.

There are also empirical studies questioning the efficiency of EVA®. Fernandez (2001), using a representative sample of American and European firms, and based on data provided by Stern Stewart & Company, analyzes the correlation between the MVA (*Market Value Added)* and the EVA®, NOPAT (*Net Operating Profit After Taxes*), and WACC (*Weighted Average Cost of Capital*). Fernandez observes a low (and sometimes negative) correlation between EVA® and MVA, and concludes that NOPAT and WACC present higher levels of correlation with MVA (which is the best indicator of shareholder wealth). These results are in the line of those obtained by Biddle, Bowen and Wallace (1997), Riceman, Cahan and Lal (2000), and Kramer and Pushner (1997).

Biddle, Bowen & Wallace (1997), motivated by the huge increase in the use of EVA®, and using data provided by Stern Stewart & Company, analyze the EVA® information content with respect to other accounting-based measures. They find evidence that accounting earnings and operating cash flows are more closely associated to stock market returns or firm values than EVA®. In the same line, Chen and Dodd (2001) examines the information content (in terms of value-relevance) of operating income, residual income, and EVA®. Using different testing methodologies, they find that operating income and residual income present higher information content levels than the EVA® measure. Similar results are obtained by Clinton and Chen (1998).

Thus we see that the literature provides several studies questioning the claimed superiority of EVA® to earnings or other accounting measures in its association with stock returns or firm values.

Additionally, Wallace (1997), analyzing a sample of forty firms that adopt residual income compensation plans (23 of them applying the trademarked EVA® technique), obtains several important conclusions. First, he observes that firms that adopt residual income compensation plans do not present statistically significant abnormal returns over the market portfolio. At the same time he observes that those

firms that adopt residual income compensation plans present highly significant increments in their residual income measures, a "*you get what you measure and reward*" kind of effect.

Our paper is in the line of Wallace's study, but there are some important differences. First, Wallace analyzes all the firms that adopt residual income-based compensation plans, while we only focus on those firms that apply the EVA® methodology (trademarked by Stern Stewart & Co.). Second, Wallace uses monthly stock return data, while we use daily stock return data to develop an event study methodology. Finally, the time period of the study is quite different. Wallace only analyzes firms that adopt residual income-based compensation plans over the ten-year period ending fiscal year 1994. Our paper analyzes firms that adopt the EVA® technique during the period 1982-1999.

Based on the event study we can analyze how the company stock market price evolves around the adoption date. However, it will be also interesting to analyze how the company profile evolves before and after the EVA® adoption.

Additionally, analyzing the EVA® literature we can observe that EVA® defenders claim that EVA® can help to improve operating profits, the cost of capital and the investment activity (Prober, 2000). Thus, in order to test this claim, and in order to complement the event study conclusions, we will also analyze the evolution of three sets of variables: performance measures (ROA, and Annual Average Monthly Market Return), investment activity indicators (Price to Book ratio, Tobin-q ratio, Debt to Assets, R&D to Sales, and Total Assets), and cash flow measures (Cash Flow Margin, and EBIDTA Margin). In order to obtain a long term evolution we analyze how these three sets of firm variables evolve during the period between 5 years before and 5 years after the adoption.

Sample and Methodology

Sample.

As we pointed out before, the main goal of the paper is to analyze the market reaction to EVA® adoption. The list of EVA® firms and their adoption day is obtained from Stern Stewart & Company marketing brochures. We detect an initial list of 65

events/firms, all the events being from different firms (the list of firms is given in the appendix). Following the firm main SIC code, we analyze the sample sectorial distribution (see figures 2 and 3). We can observe that we are working with a representative sample, in which the manufacturing sector is the most important one. If we decompose this sector, we can observe that the Electronic and Computer sector presents the highest level of adoption, probably because this sector was one of the most affected by the competitive crisis of the 80's. Additionally we also know that this sector is the one that usually presents higher levels of competitiveness and rapid evolution, and probably this requires that firms apply the latest management techniques in order to maintain their competitiveness and market position.

Figure 2. *Sectorial Distrution.*

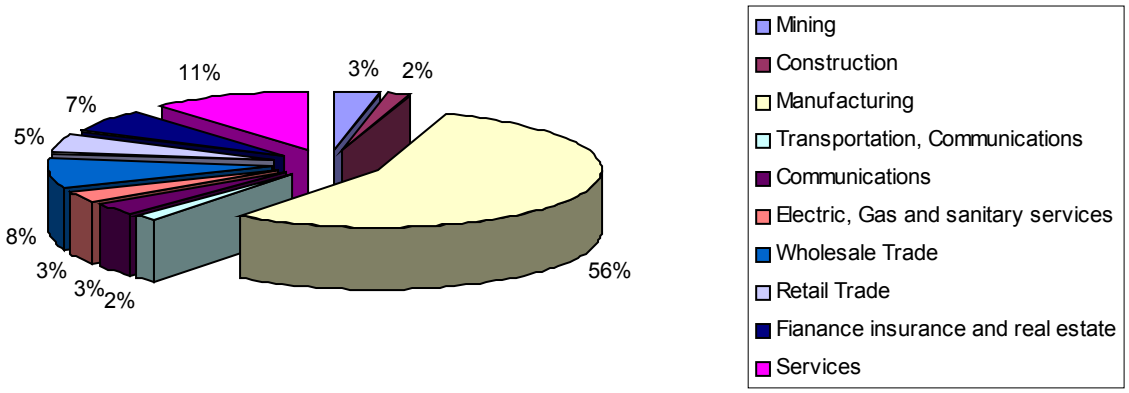
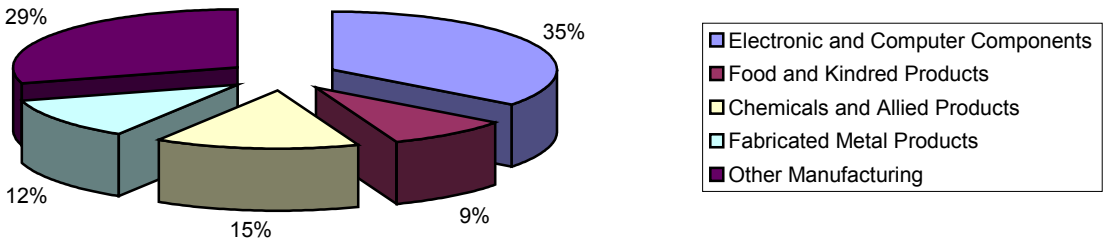


Figure 3. *Manufacturing sector distribution.*



Starting from this initial firm list, we apply several restrictions in order to obtain robust results. First, for the event study, we consider an estimation period of 300 days. The estimation period is the period between (-330,-30), where moment 0 is the adoption day. We establish a minimum of 200 daily returns for the estimation period. As usual, any non-trading date is converted to the next trading day. The second restriction is that the firm accounting-based information is available in *Compustat Database*. Applying both restrictions we end up with a sample of 61 firms/events.

Event Study Methodology.

As pointed out before, the estimation period is set between (-330, -30) (where 0 is the EVA® adopting day). The event window is set between the –30 day to the +100 day. However, we focus on the daily data for the period (-15,+30). Based on this event window we compute the CAAR from a set of windows embedded in this event window. Specifically, we analyze the windows (-30,0), (-20,0), (-10,0), (0,+20), (0,+30), (0,+50), (0,+60), (0,+90), (0,+100).

According to the traditional market model, we can represent the stock return of the firm j in day t as:

$$r_{j,t} = \alpha + \beta . r_{m,t} + \varepsilon_{j,t}$$

Thus, we can define the abnormal return of j-firm ($AR_{j,t}$), as:

$$AR_{j,t} = r_{j,t} - \hat{\alpha} - \hat{\beta} . r_{m,t}$$

Where ($\hat{\alpha}, \hat{\beta}$) are the parameters estimated during the estimation period. The Average Abnormal Return of period t (AAR_t), can be defined as:

$$AAR_t = \frac{\sum_{j=1}^{J} AR_{j,t}}{J}$$

Finally the Cumulative Average Abnormal Return in the window (T_1,T_2) ($CAAR_{T_1,T_2}$), is:

$$CAAR_{T_1,T_2} = \frac{\sum_{j=1}^{J}\sum_{t=T_1}^{T_2} AR_{j,t}}{J}$$

In order to obtain robust results, we apply different Event Study Methodologies and test statistics. We develop the traditional Event Study Methodology and compute the traditional t-statistics for each daily return AAR_t, and for each $CAAR_t$. Additionally, we also apply the Standardized Abnormal Return method, and compute the z-statistic proposed by Patell (1976). This method is based on the concept of standardized abnormal return that can be defined as:

$$SAR_{j,t} = \frac{AR_{j,t}}{S_{AR_{j,t}}}$$

Where ($S_{AR_{j,t}}$) is the maximum likelihood estimate of the variance of $AR_{j,t}$. Under a set of conditions (see Patell, 1976), the test statistic for the hypothesis $(CAAR_{T_1,T_2} = 0)$, follows (under the null hypothesis) a standard normal distribution.

The traditional event study t-statistic use the standard error from the time series standard deviation of estimation period. As Pilotte (1992), we apply the cross sectional method, that consists in recompute the t-statistic using for each event date the cross sectional (across securities) standard deviation.

Finally, we also compute the standardized cross-sectional test proposed by Mikkelson and Partch (1988). This test corrects the test of Patell (1976), and adjusts the CAAR for the possible serial correlation of the abnormal returns of each stock. As Cowan (1993) points out, serial correlation may be an important factor for long windows (i.e., windows of 100 days' length). This statistics also follows a standard normal distribution.

As we will see next, all the studies and test statistics generate similar results, both using equally weighted and value weighted market index. Therefore, the conclusions of this paper appear to be robust with respect to the adopted methodology.

The daily firms and market returns needed for the event study are obtained from *CRSP Database*. The value weighted and the equally weighted index used in the event study are the *NYSE-AMEX-Nasdaq* indexes provided by *CRSP Database* using all stocks. However we also develop the study using the *S&P500* and *Composite* market indexes, obtaining identical results.

Company Analysis Methodology.

The data used in this section are obtained from *Compustat Database*. We know that through the Event Study methodology we only capture the short-term stock market evolution around the adoption date. Thus, and in order to complement the event study conclusions, we use annual data to capture the long-term firm evolution around the adoption date. We analyze the cross time evolution of three sets of key firm variables in the period from 5 years before to 5 years after the adoption. First we analyze profitability measures such as the Return on Assets, and the Annual Average Monthly Market Return. ROA is obtained directly from Compustat Database, and is the usual measure used in the literature to capture the firm performance evolution. Additionally, in order to analyze both accounting-based and market-based firm performance measures, we also analyze the Annual Average Monthly Market Return.

The second set of measures analyzed in this section is related to the firm investment activity. We analyze the Price to Book ratio and the Tobin-q ratio (using the approximation proposed by Chung & Pruitt, 1994). Both measures are used by the literature as proxies for the firm investment opportunities set (Fenn & Liang, 2001;

Martin, 1996; Wright, Ferris, Sarin, & Awasthi, 1996). We also analyze the Debt to Assets ratio, to analyze how the investment activity is financed. The R&D to Sales ratio represents the ratio between R&D expenses divided by Sales, an it is frequently used in the literature to measure directly the firm investment activity. Finally, in order to analyze the impact of company investment activity to company size before and after the adoption, we also analyze the time evolution of firm Total Assets item.

The third set of variables measures the cash flow of the firms. We analyze the Cash Flow Margin (Income Before Extraordinary Items plus Depreciation and Amortization, scaled by Sales). We also analyze the EBIDTA Margin, since some studies use this variable as a proxy for the Free Cash Flow (Fenn and Liang, 2001). The EBIDTA Margin is the Earnings Before Interest, Taxes and Depreciation, scaled by Sales.

Abnormal market returns around the EVA® adoption

As discussed before, in order to obtain robust conclusions we apply different event studies methodologies and test statistics.

We first develop the traditional event study methodology, computing the traditional t-statistics (column 1), both for the daily and cumulative average abnormal returns (AAR and CAAR respectively). Additionally we develop the Standardized Residual Methodology proposed by Patell (1976). This methodology use the z-statistic instead of the traditional t-statistic to test the null hypothesis that daily and cumulative average abnormal returns are equal to zero (column 2).

As Pilotte (1992), we compute the t-statistic using the cross sectional methodology (CS-t-statistic), using the cross sectional standard deviation (column 3). We also compute the Generalized Sign Z-statistic for the proportion of positive and negative abnormal returns (column 4).

We consider either an Equally Weighted (EW) index or a Value Weighted (VW) index for market return. The results are presented in tables 1 and 3 (using EW index), and 2 and 4 (using VW index), for daily and cumulative abnormal returns, respectively.

Table 1. Daily Abnormal Returns. EW Index.

Day	AAR	Pos:Neg	t-Stat (1)	Z-Stat (2)	CS-t-Stat (3)	Gen. Sign Z (4)
-30	-0.04%	24:31	-0.16	-0.139	-0.191	-0.540

-29	0.02%	25:30	0.08	-0.089	0.069	-0.270
-28	0.31%	29:26	1.27	0.735	1.401	0.810
-27	-0.26%	22:33	-1.06	-0.611	-1.318	-1.081
-26	0.29%	27:28	1.19	1.201	1.162	0.270
-25	-0.01%	22:33	-0.04	-0.317	-0.037	-1.081
-24	0.36%	28:27	1.48	1.519	1.835$	0.540
-23	-0.15%	19:36	-0.62	-0.352	-0.680	-1.891$
-22	0.11%	30:25	0.45	-0.230	0.412	1.080
-21	0.31%	29:26	1.27	0.887	1.287	0.810
-20	0.27%	30:25	1.11	1.667$	1.241	1.080
-19	0.08%	22:33	0.33	-0.332	0.267	-1.081
-18	-0.16%	19:36	-0.66	-0.993	-0.803	-1.891$
-17	-0.24%	20:35	-0.97	-1.221	-0.870	-1.621
-16	0.10%	30:25	0.41	0.239	0.435	1.080
-15	0.29%	28:27	1.19	0.950	0.919	0.540
-14	-0.08%	26:29	-0.33	-0.243	-0.431	-0.000
-13	0.19%	29:26	0.78	1.145	0.795	0.810
-12	-0.28%	25:30	-1.15	-0.942	-0.969	-0.270
-11	0.24%	33:22	0.99	1.259	0.883	1.890$
-10	0.20%	32:23	0.82	1.331	0.781	1.620
-9	-0.53%	23:32	-2.18*	-1.646$	-1.808$	-0.811
-8	0.26%	34:21	1.07	1.539	1.113	2.160*
-7	0.07%	30:25	0.29	-0.022	0.303	1.080
-6	0.18%	32:23	0.74	1.025	0.718	1.620
-5	0.32%	31:24	1.31	1.476	1.475	1.350
-4	0.46%	35:20	1.89$	1.976*	2.026*	2.431*
-3	-0.21%	23:32	-0.86	-0.704	-0.994	-0.811
-2	0.36%	31:24	1.48	1.069	1.391	1.350
-1	-0.26%	19:36	-1.07	-1.220	-1.124	-1.891$
0	0.10%	27:28	0.40	0.492	0.441	0.270
+1	0.27%	27:28	1.10	0.624	1.109	0.270
+2	-0.47%	22:33	-1.91$	-1.378	-1.703$	-1.081
+3	0.21%	27:28	0.86	0.391	0.597	0.270
+4	0.01%	27:28	0.04	0.038	0.054	0.270
+5	0.07%	26:29	0.29	0.315	0.318	-0.000
+6	0.52%	30:25	2.11*	2.130*	2.609**	1.080
+7	-0.17%	21:34	-0.68	-0.685	-0.972	-1.351
+8	-0.39%	18:37	-1.60	-1.696$	-2.344*	-2.161*
+9	0.11%	28:27	0.45	0.452	0.546	0.540
+10	0.29%	28:27	1.20	1.121	1.105	0.540
+11	-0.03%	23:32	-0.13	-0.327	-0.105	-0.811
+12	0.13%	24:31	0.54	0.684	0.440	-0.540
+13	-0.33%	17:38	-1.35	-1.563	-1.370	-2.431*
+14	-0.35%	24:31	-1.42	-1.417	-1.232	-0.540
+15	-0.23%	29:26	-0.92	-0.515	-1.009	0.810
+16	-0.07%	24:31	-0.28	-0.582	-0.288	-0.540
+17	0.01%	27:28	0.06	0.053	0.067	0.270
+18	0.04%	25:30	0.17	0.214	0.221	-0.270
+19	-0.09%	25:30	-0.39	-0.436	-0.453	-0.270
+20	-0.09%	24:31	-0.38	-0.544	-0.338	-0.540
+21	0.67%	30:25	2.76**	2.472*	2.349*	1.080
+22	0.05%	32:23	0.21	0.355	0.207	1.620
+23	0.15%	24:31	0.62	0.008	0.494	-0.540
+24	-0.16%	25:30	-0.66	-0.393	-0.613	-0.270
+25	-0.15%	22:33	-0.62	-0.905	-0.623	-1.081
+26	-0.07%	31:24	-0.28	0.112	-0.373	1.350
+27	-0.12%	23:32	-0.51	-0.733	-0.361	-0.811
+28	0.05%	28:27	0.20	-0.131	0.235	0.540
+29	0.09%	31:24	0.37	0.737	0.485	1.350

+30	0.26%	36:19	1.07	1.419	1.079	2.701**

Where $ means significant at 10%, * significant at 5%, ** significant at 1%, and *** significant at 0,1%.

Analyzing tables 1 and 2, both Traditional t-statistic (column 1), the Z-statistic (column 2), the Cross-Sectional t-statistic (column 4), and the Generalized Sign test (column 4), we observe no significant market reaction prior or after EVA® adoption. Prior the EVA® adoption we observe a positive significant abnormal return for the day 4, and a negative significant abnormal return for the day 9. The rest of abnormal returns prior the EVA® adoption are not significant, but we observe 19 daily abnormal returns front 11 negative abnormal returns.

For the period after the EVA® adoption we observer positive significant abnormal returns for the day 6 and 21. Days 2 and 8 present significant negative abnormal returns. The rest of daily abnormal returns after the adoption are not significant, with a fair number of them being negative (14 daily negative abnormal returns front 16 positive). The results are consistent for both the Equally Weighted Index (table 1), and the Value Weighted Index (table 2).

Table 2. Daily Abnormal Returns. VW Index.

Day	AAR	Pos:Neg	t-Stat (1)	Z-Stat (2)	CS-t-Stat (3)	Gen. Sign Z (4)
-30	-0.03%	24:31	-0.12	-0.049	-0.140	-0.550
-29	-0.04%	24:31	-0.17	-0.229	-0.185	-0.550
-28	0.25%	27:28	1.04	0.336	1.106	0.260
-27	-0.35%	20:35	-1.45	-0.994	-1.769$	-1.630
-26	0.34%	31:24	1.41	1.460	1.327	1.340
-25	0.01%	20:35	0.04	-0.265	0.031	-1.630
-24	0.28%	30:25	1.16	1.112	1.427	1.070
-23	-0.07%	21:34	-0.29	0.025	-0.322	-1.360
-22	0.14%	29:26	0.58	0.009	0.547	0.800
-21	0.36%	33:22	1.50	1.185	1.518	1.881$
-20	0.27%	31:24	1.12	1.758$	1.262	1.340
-19	0.05%	20:35	0.20	-0.451	0.164	-1.630
-18	-0.15%	20:35	-0.62	-0.913	-0.713	-1.630
-17	-0.18%	22:33	-0.75	-0.938	-0.662	-1.090
-16	0.16%	32:23	0.66	0.479	0.676	1.611
-15	0.26%	27:28	1.08	0.763	0.803	0.260
-14	-0.14%	26:29	-0.58	-0.452	-0.718	-0.010
-13	0.10%	28:27	0.41	0.807	0.431	0.530
-12	-0.37%	23:32	-1.54	-1.289	-1.264	-0.820
-11	0.23%	32:23	0.96	1.200	0.819	1.611

-10	0.13%	31:24	0.54	0.971	0.552	1.340
-9	-0.57%	23:32	-2.37*	-1.819$	-1.975*	-0.820
-8	0.21%	34:21	0.87	1.359	0.889	2.151*
-7	0.11%	29:26	0.46	0.022	0.472	0.800
-6	0.24%	31:24	0.99	1.270	0.956	1.340
-5	0.32%	31:24	1.33	1.547	1.423	1.340
-4	0.48%	36:19	1.99*	2.009*	2.113*	2.691**
-3	-0.28%	24:31	-1.16	-1.008	-1.417	-0.550
-2	0.32%	33:22	1.33	0.851	1.300	1.881$
-1	0.09%	24:31	0.37	0.182	0.380	-0.550
0	0.02%	24:31	0.10	0.085	0.118	-0.550
+1	0.27%	26:29	1.10	0.544	1.107	-0.010
+2	-0.47%	23:32	-1.94$	-1.513	-1.721$	-0.820
+3	0.28%	29:26	1.17	0.700	0.829	0.800
+4	-0.02%	28:27	-0.07	-0.128	-0.077	0.530
+5	0.00%	27:28	0.02	0.043	0.021	0.260
+6	0.49%	34:21	1.99*	2.066*	2.541*	2.151*
+7	-0.12%	20:35	-0.48	-0.586	-0.726	-1.630
+8	-0.36%	18:37	-1.50	-1.667$	-2.255*	-2.170*
+9	0.06%	28:27	0.25	0.260	0.317	0.530
+10	0.25%	27:28	1.03	0.958	0.991	0.260
+11	-0.06%	22:33	-0.23	-0.430	-0.194	-1.090
+12	0.13%	27:28	0.52	0.659	0.423	0.260
+13	-0.31%	15:40	-1.27	-1.468	-1.245	-2.981**
+14	-0.36%	24:31	-1.48	-1.483	-1.317	-0.550
+15	-0.27%	23:32	-1.10	-0.661	-1.208	-0.820
+16	-0.13%	22:33	-0.52	-0.820	-0.514	-1.090
+17	0.09%	26:29	0.36	0.340	0.420	-0.010
+18	-0.03%	25:30	-0.11	0.067	-0.138	-0.280
+19	-0.25%	25:30	-1.04	-1.185	-1.181	-0.280
+20	-0.06%	27:28	-0.24	-0.405	-0.229	0.260
+21	0.69%	32:23	2.82**	2.561*	2.369*	1.611
+22	0.04%	32:23	0.18	0.243	0.176	1.611
+23	0.13%	24:31	0.55	-0.118	0.430	-0.550
+24	-0.19%	26:29	-0.79	-0.486	-0.746	-0.010
+25	-0.17%	20:35	-0.71	-1.008	-0.708	-1.630
+26	-0.05%	28:27	-0.21	0.121	-0.290	0.530
+27	-0.14%	23:32	-0.58	-0.812	-0.422	-0.820
+28	0.08%	27:28	0.33	-0.035	0.373	0.260
+29	0.02%	26:29	0.08	0.388	0.107	-0.010
+30	0.15%	33:22	0.62	1.005	0.644	1.881$

We also analyze the CAAR of a set of windows set prior and after the EVA® adoption in tables 3 (using EW index), and 4 (using VW index).

In the windows set right after the adoption day, we not observe any significant positive CAAR. Although not significant we observe some negative CAAR. The sequent windows present not significant positive CAAR. Thus we can conclude that far from a positive market reaction, we observe a not significant (and sometimes negative) market reaction after the EVA® adoption.

Table 3. Cumulative Abnormal Returns. EW Index.

Window	CAAR	Pos:Neg	t-Stat (1)	Z-Stat (2)	CS-t-Stat (3)	Gen Sign. Z (4)
(-30,0)	2.29%	30:25	1.69$	1.69$	1.74$	1.08
(-20,0)	1.36%	36:19	1.22	1.49	1.36	2.70**
(-10,0)	0.95%	34:21	1.18	1.60	1.44	2.16*
(0,+20)	-0.44%	23:32	-0.40	-0.58	-0.42	-0.81
(0,+30)	0.31%	29:26	0.23	0.05	0.26	0.81
(0,+50)	2.08%	29:26	1.20	1.30	1.29	0.81
(0,+60)	1.81%	26:29	0.95	1.18	1.14	-0.00
(0,+90)	2.20%	30:25	0.95	1.20	0.99	1.08
(0,+100)	1.39%	32:23	0.57	0.92	0.58	1.62

With respect to CAAR prior to the adoption date, we can observe some significant positive CAAR (see columns 3 and 4). Thus one can conclude that the reason why we do not observe significant positive abnormal returns after the EVA® adoption is due to the fact that market anticipate the adoption, probably since the adoption information is known by the market prior to their formal adoption. Whatever these CAAR are high weakly significant, and thus, we can not obtain robust results.

Table 4. Cumulative Abnormal Returns. VW Index.

Window	CAAR	Pos:Neg	t-Stat (1)	Z-Stat (2)	CS-t-Stat (3)	Gen Sign. Z (4)
(-30,0)	2.18%	29:26	1.61	1.62	1.79$	0.80
(-20,0)	1.30%	33:22	1.17	1.40	1.33	1.88$
(-10,0)	1.06%	36:19	1.32	1.64$	1.77$	2.69**
(0,+20)	-0.83%	24:31	-0.75	-1.01	-0.78	-0.55
(0,+30)	-0.28%	22:33	-0.21	-0.50	-0.23	-1.09
(0,+50)	1.37%	28:27	0.79	0.76	0.82	0.53
(0,+60)	0.66%	25:30	0.35	0.42	0.39	-0.28
(0,+90)	0.48%	27:28	0.21	0.32	0.21	0.26
(0,+100)	-0.99%	29:26	-0.41	-0.20	-0.41	0.80

As we mentioned before, we also apply the methodology proposed by Mikkelson and Partch (1988) in order to correct cumulative abnormal returns for stock serial dependence. This only affects the CAAR z-statistics. The results are presented in tables 5 (using EW index), and 6 (using VW index).

Table 5. Cumulative Abnormal Returns corrected by Serial Dependence. EW Index.

Window	CAAR-EW	CAAR-PW	Median CAR	SD-Z	Pos:Neg	Gen Sign Z
(-30,0)	2.29%	2.02%	0.44%	1.62	30:25	1.08
(-20,0)	1.36%	1.46%	1.78%	1.45	36:19	2.70**
(-10,0)	0.95%	1.14%	1.80%	1.57	34:21	2.16*
(0,+20)	-0.44%	-0.56%	-0.56%	-0.57	23:32	-0.81
(0,+30)	0.31%	0.06%	0.86%	0.04	29:26	0.81
(0,+50)	2.08%	1.99%	0.73%	1.19	29:26	0.81
(0,+60)	1.81%	1.98%	-0.84%	1.06	26:29	-0.00
(0,+90)	2.20%	2.46%	2.74%	1.03	30:25	1.08
(0,+100)	1.39%	1.99%	2.96%	0.78	32:23	1.62

Table 6. Cumulative Abnormal Return corrected by Serial Dependence. VW Index.

Window	CAAR-VW	CAAR-PW	Median CAR	SD-Z	Pos:Neg	Gen Sign Z
(-30,0)	2.18%	1.90%	1.07%	1.55	29:26	0.80
(-20,0)	1.30%	1.35%	1.40%	1.36	33:22	1.88$
(-10,0)	1.06%	1.15%	1.22%	1.62	36:19	2.69**
(0,+20)	-0.83%	-0.98%	-0.85%	-1.00	24:31	-0.55
(0,+30)	-0.28%	-0.58%	-1.10%	-0.50	22:33	-1.09
(0,+50)	1.37%	1.15%	0.34%	0.70	28:27	0.53
(0,+60)	0.66%	0.69%	-1.94%	0.38	25:30	-0.28
(0,+90)	0.48%	0.64%	-0.21%	0.27	27:28	0.26
(0,+100)	-0.99%	-0.42%	0.85%	-0.19	29:26	0.80

Correcting CAAR by serial dependence, now we not observe any significant.

The main conclusion that we can draw from these different event studies methodologies and test statistics is that we do not observe any significant market reaction after the EVA® adoption, and that sometimes this reaction, although not significant, is negative. We observe some weakly positive abnormal returns prior adoption, but these results are so weakly to conclude that market anticipate EVA® adoption prior to their formal adoption.

We conclude that the market does not appear to consider EVA® adoption as likely to lead to a significant increase in the value of the firm.

The same results are obtained if we use as market index the S&P500 or Composite.

Company profile before and after the EVA® adoption

We now analyze how some of the most important firm variables evolve before and after the firm adoption of the EVA® technique. We analyze three sets of measures: profitability measures (ROA, and Annual Average Monthly Market Return), investment measures (Price to Book ratio, Tobin-q ratio, Debt to Assets, the R&D to Sales ratio, and the Total Assets item), and cash-flow measures (Cash Flow Margin, and the EBIDTA Margin). In order to capture the long-term evolution, these variables are analyzed in the period from 5 years before to 5 years after the adoption.

Profitability measures

In the set of firm performance measures we analyze both accounting and market based firm performance measures. We select two measures, one accounting based measure (Return on Assets), and one market based measure (Annual Average Monthly Market Return).

ROA	**-5**	**-4**	**-3**	**-2**	**-1**	***0***	**1**	**2**	**3**	**4**	**5**
Average	6.439	5.266	4.742	3.913	4.419	***5.339***	5.544	5.172	4.139	4.464	7.946
Median	5.699	4.930	4.944	3.769	3.744	***5.832***	5.540	3.976	3.683	4.612	7.820
Std. Dev.	6.003	3.591	3.933	4.045	5.004	***4.522***	4.250	6.105	5.686	10.292	5.513

Annual Average Monthly Return	**-5**	**-4**	**-3**	**-2**	**-1**	***0***	**1**	**2**	**3**	**4**	**5**
Average	2.018	1.074	0.704	0.878	1.848	***1.837***	1.716	1.064	0.927	0.540	1.853
Median	1.808	1.055	0.812	1.192	1.398	***1.786***	1.843	0.598	1.201	0.656	2.242
Std. Dev.	2.014	2.911	2.581	2.248	2.408	***3.247***	2.737	4.072	3.459	3.659	2.601

Both measures appear to be declining up to year –2, when they start improving until year zero. However, following the introduction no clear positive improving trend emerges. Only in year 5 after the adoption the ROA appears to be clearly better than before the adoption. This is also true for the median monthly return, but not for the average.

Investment Activity measures

We now check whether the EVA® introduction affects the company investment activity. We analyze five measures: the Price to Book ratio, Tobin-q ratio, Debt to Assets, the R&D to Sales ratio, and the firm Total Assets. The Price to Book and the Tobin-q ratios are used in the literature as proxies of the firm investment opportunities set. Debt to assets ratio measures the firm leverage, and the R&D to sales ratio measures directly the R&D firm activity.

Price to Book	**-5**	**-4**	**-3**	**-2**	**-1**	***0***	**1**	**2**	**3**	**4**	**5**
Average	2.226	2.233	2.100	2.155	2.210	***2.606***	2.900	2.862	2.952	3.982	3.971
Median	1.784	1.930	1.916	1.870	2.308	***2.266***	2.325	2.385	2.265	2.948	2.797
Std. Dev.	1.150	1.427	1.100	1.245	1.891	***2.600***	3.310	3.130	7.328	4.138	3.597

Tobin-q Ratio	**-5**	**-4**	**-3**	**-2**	**-1**	***0***	**1**	**2**	**3**	**4**	**5**
Average	1,035	0,982	0,903	0,939	1,022	***1,227***	1,329	1,315	1,538	1,495	1,661
Median	0,832	0,911	0,831	0,858	0,931	***0,945***	0,953	1,015	0,986	0,895	1,080
Std. Dev.	0,607	0,525	0,521	0,580	0,628	***0,828***	1,022	1,172	1,726	1,509	1,501

Debt to Assets	**-5**	**-4**	**-3**	**-2**	**-1**	***0***	**1**	**2**	**3**	**4**	**5**
Average	24.574	25.106	25.817	24.269	26.371	***27.308***	27.009	27.421	27.035	28.037	26.807
Median	27.167	25.970	27.746	24.009	28.031	***27.431***	28.820	28.351	28.747	31.575	28.737
Std. Dev.	13.196	13.545	15.036	15.031	13.978	***14.607***	14.142	13.637	13.676	12.942	11.969

R&D to Sales	**-5**	**-4**	**-3**	**-2**	**-1**	***0***	**1**	**2**	**3**	**4**	**5**
Average	3.059	2.962	3.029	3.423	3.202	***3.216***	3.186	4.132	5.634	4.100	4.215
Median	1.963	1.739	1.329	1.356	1.385	***1.718***	1.597	1.469	1.759	1.723	1.720
Std. Dev.	3.395	3.319	3.490	4.238	4.000	***4.041***	3.989	5.947	11.405	5.343	5.492

Total Assets	**-5**	**-4**	**-3**	**-2**	**-1**	***0***	**1**	**2**	**3**	**4**	**5**
Average	2.329,6	2.592,3	2.739,0	2.914,0	3.314,8	***3.685,2***	4.244,9	4.374,1	3.891,6	3.524,7	4.057,8
Median	1.252,0	1.507,1	1.787,9	1.974,9	1.992,8	***2.143,8***	2.164,2	2.197,7	1.930,0	1.800	1.881,5
Std. Dev.	2.807,1	3.182,5	3.208,8	3.315,4	4.013,8	***4.529,4***	5.487,6	5.320,4	4.554,9	3.999,5	4.828,5

Analyzing the Price to Book and Tobin-q ratios we can observe significant increments after the firm adopts the EVA® technique. This can be interpreted in the sense that firms increase their investment activity, investing in new investment projects that increase the firm investment opportunity set. This fact is corroborated by the evolution of the R&D to sales ratio analyzed in the study. However, if we analyze the evolution of the Total Assets item, we observe that this increment in the firm investment activity is not followed by an increase in the firm size. This can be interpreted in the sense that the EVA® methodology provides incentives to managers to increment firm investment activity, not with the objective to increase firm size (that sometimes generate important inefficiencies), but in order to improve firm economic value and future perspectives.

In the case of R&D expenses to sales, some comments are in order. According to U.S. accounting rules (SFAS 2), R&D expenses are considered as expenses in the fiscal year in which they are done (and thus, must appear in the P&L account). EVA® considers R&D expenses as an asset acquisition (Stewart, 1991). Therefore, accounting NOPAT is adjusted adding back the R&D expense and deducting the amortization of the R&D asset (Stewart, 1991: 28-30). This fact can explain why EVA® firms experience this high increment in the R&D to sales ratio after the EVA® adoption.

Additionally we can observe an increment in the Debt to Assets ratio. This can be interpreted in the sense that this increment in the firm investment activity after the EVA® adoption is usually financed through higher levels of debt. This fact can be explained since NOPAT (that is directly used to compute EVA®) adds back the after tax effect of debt financing charges (interest expense) included in EBEI (Biddle et al., 1997). Thus sometimes, based on EVA®, some firms can have incentives to increase their debt ratio, since this will increase their NOPAT, and thus their EVA®. For example, M. A. Volkema (President and CEO of Herman Miller, Inc), states that:

> *"EVA® analysis has enabled us to identify waste in both our costs and overuse of capital. (...) EVA® analysis demonstrated that debt capital was cheaper than equity capital. Thus our Board year set a new debt to capital ratio of 30% to 35% (...)".*

Cash-Flow measures

Finally, since EVA® is more focused on firm cash flows than on other firm accounting measures, we also analyze some cash flow measures (i.e., Cash Flow Margin, and the EBIDTA Margin).

Cash Flow Margin	-5	-4	-3	-2	-1	*0*	1	2	3	4	5
Average	12.166	10.982	10.709	9.670	10.464	***12.919***	11.667	11.806	8.503	11.159	14.453
Median	9.154	8.739	8.020	8.625	9.544	***9.948***	10.420	10.779	9.010	11.455	13.280
Std. Dev.	10.081	7.892	7.440	6.444	7.167	***14.112***	9.182	11.783	14.547	9.434	8.093

EBIDTA Margin	-5	-4	-3	-2	-1	*0*	1	2	3	4	5
Average	16.710	16.318	16.224	16.761	17.730	***17.895***	17.926	17.208	15.308	19.054	21.173
Median	15.024	13.787	12.727	14.484	15.281	***16.887***	16.499	16.552	15.852	17.926	18.299
Std. Dev.	11.336	11.307	11.387	11.543	11.990	***9.755***	9.351	10.092	20.824	9.827	12.002

We observe that the EVA® adoption has generated significant important positive effects over Cash Flow measures. Thus we observe that, while the EVA® does not affect significantly firm performance measures such as ROA, it affects significantly and positively cash flow measures. In principle these results can be considered contradictory, but they can be explained by the EVA® nature. EVA®, establishes as the first and most important firm objective the increment of the firm economic value, measured by firm's cash flows after a set of adjustments. Additionally, and in order to provide incentives for managers, some firms that adopt EVA® link part of managerial compensation to the firm economic value added. This in turn provides incentives for managers to improve cash flow measures. This behavior is very similar to the one observed in the past with respect to accounting measures. Various empirical studies have documented that when managerial compensation is tied to firm accounting benefits, the main objective for managers becomes to increase such measures, sometimes manipulating them (Dyl, 1989; Gomez-Mejía and Balkin, 1992; Hunt, 1985; Jensen and Murphy, 1990; Verrecchia, 1986).

In order to test this hypothesis we analyze how the cash flow measures evolve around the year in which EVA® is introduced in the executive compensation system. In order to determine when firms introduce the EVA® methodology in their executive

compensation system we use the *Edgar Online SEC Documents Database*. Through this database we analyze the 10-K files and proxy statements of each sample firm, to determine when (if they do) they introduce EVA® measures in the executive compensation system. We observe that not all the sample firms introduce the EVA® in the compensation system, and that when they do, they usually do it one or two years after the EVA® introduction in the firm management system. From the original sample of 61 firms, only 45 introduce EVA® in the compensation system, while the remaining 16 firms only introduce the EVA® in the management system. Thus, we divide the initial sample in two subgroups, the first with the 45 firms that adopt both the EVA® management technique and introduce EVA® in managerial compensation, and another one with the 16 firms that only adopt the EVA® as a management technique.

We compare how the cash flow measures evolve in the two groups. In the first group we fix year 0 in the year when the firm introduces the EVA® methodology in the compensation system. In the second group we fix year 0 in the year when the firm introduces the EVA® methodology in the management system. Thus we analyze and compare how the cash flow measures evolve around (in the 5 years prior and after the adoption) this year 0, in both groups.

Group 1. Firms that introduce the EVA® in the compensation system.

Cash Flow Margin	**-5**	**-4**	**-3**	**-2**	**-1**	***0***	**1**	**2**	**3**	**4**	**5**
Average	10.282	9.789	8.620	9.958	10.617	***10.604***	10.527	8.792	11.135	13.193	10.556
Median	8.322	7.543	7.027	9.117	8.631	***9.014***	9.499	7.327	11.720	10.596	8.812
Std. Dev.	7.651	6.728	5.644	6.299	8.904	***6.650***	7.025	7.616	10.437	7.376	8.096

EBIDTA Margin	**-5**	**-4**	**-3**	**-2**	**-1**	***0***	**1**	**2**	**3**	**4**	**5**
Average	14.360	14.301	15.062	16.331	16.730	***17.478***	17.148	17.661	18.806	21.209	16.966
Median	13.435	11.498	11.627	13.778	13.674	***15.073***	15.680	15.986	17.194	17.835	14.335
Std. Dev.	8.278	8.485	9.891	10.210	10.286	***9.969***	9.873	10.690	10.222	12.248	9.548

Group 2. Firms that introduce the EVA® only in the management system.

Cash Flow Margin	–5	–4	-3	-2	-1	*0*	1	2	3	4	5
Average	18.532	15.420	14.322	13.040	13.679	***18.830***	15.546	17.083	7.810	15.050	16.479
Median	13.784	10.157	8.572	10.887	11.671	***13.842***	11.632	12.745	13.408	13.031	14.566
Std. Dev.	13.617	11.026	8.991	7.894	8.421	***24.003***	13.931	19.905	27.188	7.926	7.772

EBIDTA Margin	–5	-4	-3	-2	-1	*0*	1	2	3	4	5
Average	23.946	22.994	22.554	22.514	24.082	***20.913***	19.605	19.398	10.724	21.663	21.693
Median	18.296	15.922	15.978	17.714	19.661	***18.933***	18.350	19.069	19.449	19.256	19.363
Std. Dev.	16.467	17.585	16.588	14.936	15.118	***8.178***	7.476	10.429	38.761	9.461	12.025

Analyzing the Cash Flow and the EBIDTA Margin evolutions in the first group (firms that introduce EVA® in the compensation system) we observe no significant reaction (neither positive or negative) after the introduction. However we must point out that the small size of the two sub-samples does not let us provide robust conclusions.

Conclusions

EVA® constitutes nowadays one of the most important and widely spread management techniques. EVA® assumes that the Economic Value Added (defined as the change in the Net Operating Profit After Taxes minus the change in the Cost of the Capital used to generate it), is the best shareholder wealth measure, and thus, must be the key variable used by managers in the decision making process. The way to achieve this goal is usually to link part of managerial compensation to firm' EVA®.

There is a large literature that analyzes EVA® information content (Biddle, Bowen and Wallace, 1997; Chen and Dodd, 2001; Clinton and Chen, 1998), and its correlation with Market Value Added (Fernandez, 2001; Kramer and Pushner, 1997; Riceman, Cahan and Lal, 2000; Walbert, 1994), obtaining mixed results.

This paper, using an event study methodology, analyzes the market reaction when a firm adopts the EVA® technique of a representative sample of 61 firms that adopt EVA® during the period 1983 to 1998. We do not observe any significant market reaction (neither positive nor negative) after the EVA® adoption. This result appears to be in conflict with some other studies (i.e., O'Byrne, 1997, Walbert, 1994), that observe that EVA® companies present high levels of stock market returns. This conflict will be probably due to the fact that the explosion of the EVA® technique occurs in the middle and the second part of the 90s, when the market presents a bull situation. Probably, the positive stock market evolution observed these studies can be attributed to the stock market tendency and not to the EVA® properties. Since our paper analyze abnormal returns, we do not observe this positive market evolution observed by these studies.

Our results are in the line of Chen and Dodd (2001) and Biddle et al. (1997). Both papers observe that the market price evolution may rely more on audited accounting earnings than on the unaudited EVA®.

Additionally, we also analyze how the company profile evolves around the EVA® adoption. The main objectives of this second study is to analyze the long term firm evolution, and to check whether EVA® helps to improve operating profits, the cost of capital and the investment activity (Prober, 2000; Stewart, 1991). We analyze three sets of firm variables: firm performance variables, investment variables, and cash flow variables. In the first set we observe that firms usually adopt EVA® after a long time

period of bad firm performance. After the adoption, the firm performance measures do not improve immediately, but only in the long run. Analyzing firm investment variables, we observe that EVA® adoption increases firm investment activity. We also observe increments in the debt ratios.

Finally, since EVA® focus on firm cash flow, we also analyze the evolution of company cash flow variables. We observe a positive impact on the Cash Flow Margin and the EBIDTA after the adoption. This may be due to the fact that managerial compensation depends positively on these variables, and to check this hypothesis we analyze separately the evolution of cash flow variables for firms that introduce EVA® in managerial compensation and firms which do not. Analyzing the first group of firms we observe that after the EVA® introduction in compensation system Cash Flow and EBIDTA Margins not reacts significantly. However the small size of our sample does not let us provide robust conclusions.

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Appendix

Sample firm list

ACXIOM
ADAPTIVE BROADBAND
ADC TELECOMMUNICATIONS
ALEXANDER & BALDWIN
ARMSTRONG WORLD INDUSTRIES
BALL CORPORATION
BARD (C.R.)
BAUSCH & LOMB
BECTON DICKINSON
BEST BUY
BOISE CASCADE
BOWATER
BRIGGS & STRATTON
CDI CORPORATION
CENTURA BANKS
COCA COLA
COLUMBUS MCKINNON
COX COMMUNICATIONS
CRANE
ELI LILLY
EQUIFAX
FEDERAL MOGUL
FLEMING COMPANIES
GC COMPANIES
GEORGIA-PACIFIC
HERMAN MILLER
HERSHEY FOODS
INTERNATIONAL MULTIFOODS
J. C. PENNEY
JOHNSON OUTDOORS
KANSAS CITY POWER & LIGHT
MANITOWOC COMPANY
MATERIAL SCIENCES CORPORATION
MIDAMERICA ENERGY
MONTANA POWER
NOBLE DRILLING
OLIN
PERKINELMER
PHARMACIA (formerly MONSANTO)
POLAROID
PULTE
QUAKER OATS
R.R. DONNELLEY & SONS
RYDER SYSTEM
SILICON VALLEY BANK
SPRINT
SPX
STANDARD MOTOR PRODUCTS
TENET HEALTHCARE
TOYS R US
VULCAN MATERIALS
WEBSTER FINANCIAL
WELLMAN
WHIRPOOL
W.W. GRANGER