AN EMPIRICAL EXAMINATION OF NEGATIVE ECONOMIC VALUE ADDED FIRMS

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ABSTRACT

Economic value-added or EVA is a common metric that quantifies the value of the firm. However, recent studies that examine portfolio investment strategies using EVA suggest that portfolios formed with negative EVA earn relatively higher returns compared to some positive EVA firms. This study investigates whether firms with current negative EVAs perform well in the future. A sample of firms with negative EVAs in 2003 is identified, then four portfolios are formed by ranking firms from the most negative to the least negative EVAs. The returns of the four portfolios are tracked from 2004 through 2009 and correlated to four accounting variables, return on assets (NOPAT/TA), market-to-book ratio (MTB), leverage, and size. The results indicate that the firms with lower leverage ratio exhibit higher portfolio returns. Furthermore, firms in the categories defined as the least negative EVA and the second least negative EVA are able to turn around and generate positive abnormal returns.

JEL: G10, G11, G32

KEYWORDS: Economic Value-added (EVA), Market-to-Book, Portfolio Performance

INTRODUCTION

Numerous studies have examined the relationship between economic value-added (EVA) and stock returns, where EVA is define as [NOPAT - k*Capital +/-Adjustments]. NOPAT is net operating profits after taxes, k is weighted average cost of capital, and adjustments include various changes to the accounting data to conform to economic cash flows as calculated by Stern Stewart & Company.

Theoretically, EVAs should be positively correlated to returns, and it follows that if firms with current negative EVAs continue to exhibit future negative EVAs they should not survive nor generate high stock returns. However, an anomaly has been documented, showing that some firms with negative EVAs generate relatively high returns. This study examines the surviving negative EVA firms in two ways: (1) we investigate whether the level of negative EVAs is related to performance and (2) we attempt to determine what contributes to their survival by examining four accounting variables (return on total assets, market-to-book ratio, debt ratio, and size) documented to have explanatory power. (See Fama and French [1995, and 2007], Garvey and Milbourn [2000], among others.)

Other studies investigate the usefulness of EVA to create portfolio investment strategies. Zaima [2008] investigates portfolio investing with EVA, and ascertain that negative EVA firms earn significant portfolio returns. Also, Zaima shows that the EVA to portfolio returns relationship is U-shaped where the most negative EVA (P1) and the most positive EVA (P10) portfolios exhibit the highest returns when portfolios are divided into deciles. Other portfolios, P2 through P9, earn returns significantly below P1 and P10. Abate, Grant, and Stewart refer to the large premiums associated with negative EVA firms as "EVA future investment opportunities" [page 64, Abate, Grant, and Stewart [2004]) Past research suggests that firms with negative EVA present many unanswered questions. This study examines how surviving negative EVA firms fare in the future. By virtue of being in the sample from 2004 to 2009 these firms have survived, and perhaps, recovered. Furthermore, we examine how stock returns of negative

EVA firms are related to four accounting variables, NOPAT/TA, market-to-book ratio (MTB), size measured by Ln(total assets), and debt ratio, as studies have documented that they are correlated to returns. (e.g. Fama and French [1995, and 2007], Biddle, Bowen, ad Wallace [1997], among others). Additionally, portfolio performance using the Fama and French four-factor model is applied to establish whether they, indeed, realize the "EVA future investment opportunities" or whether investors are overly optimistic.

Our findings show that portfolio returns for negative EVA firms are significantly related to debt ratio, but not to three other variables, return on total assets, market-to-book ratio and size (measured by total assets). These results imply that the negative EVA firms do not possess the same relationship to the four accounting variables as documented for other firms. Although differences might be expected in 2003 (given their current negative EVAs) we find the lack of association to accounting variables persist over the subsequent six years (2004-2009). Moreover, returns are statistically greater for firms with the least negative EVA portfolio (C4) and the second least negative EVA portfolio (C3) compared to C2 (comprised of firms with the second most negative EVA portfolio). Finally, using the Fama and French four-factor model, we find that portfolios C3 and C4 exhibit significant abnormal returns, but portfolios C1 or C2 do not. The next section provides the literature review and the relationship between EVA and value. The data and methodology follow, then results are presented. Finally, the last section gives a summary as well as concluding comments.

LITERATURE REVIEW

Although EVA has theoretical appeal, empirical evidence are mixed. For example, Biddle, Bowen, and Wallace [1997] revealed that earnings are more highly associated with returns and firm values than EVA, residual income, or cash flow from operations. They suggest that EVA components add only marginally to information content beyond earnings. O'Byrne [1999] found a significant relationship between EVA and market value added (MVA). However, the positive EVAs and negative EVAs correlate differently to MVA. Grant (1996) found that EVA is significantly related to MVA for the top 50 firms, but the correlation diminished when the sample is expanded to the entire Stern Stewart data. Moreover, Grant [2003] suggests that firms with negative EVA generate significant "managerial noise" because they include a mix of troubled firms that may be on their way to recovery versus ones that may not recover.

Ferguson, Rentzler, and Yu [2005] found that firms that adopt EVA experience increased profitability relative to their peers, providing evidence that our sample firms may see profitability improve over time. Moreover, Fountaine, Jordan, and Phillips [2008] formed portfolios using EVA. They concluded that forming portfolios based on higher and lower values of EVA/AveBV (or EVA divided by the average book value of debt and equity) generate portfolios with cumulative returns that are statistically different, providing support that firms of negative (or low) EVAs are different from high positive EVAs. Zaima [2008] created portfolios using EVA, and found that stock returns for firms with negative EVA firms exhibited higher returns than some firms with positive EVAs. Abate, Grant, and Stewart found a similar anomaly for firms with negative EVAs. They suggest that negative EVAs are a "seemingly anomalous finding for U.S. wealth creators" and explain "that investors were confident about the future ability of the firms to generate positive economic profit even though the current EVA-to-capital ratios were negative" (Abate, Grant, and Stewart [2004], p. 66). Using a relationship between EVA and firm value developed by Abate, Grant, and Stewart [2004] we show how EVA future investment opportunities are included in the EVA to value relationship. Using their terminology, we define economic value-added, EVA as:

$$EVA = NOPAT - (k * C) \quad (1)$$

where NOPAT is the net operating profits after taxes or EBIT(1-t) (earnings before interest & taxes adjusted for taxes), k is the weighted average cost of capital of debt and equity; and C is the total net invested capital including debt and equity. Assuming no growth in project investments and it continues to perpetuity, Abate, Grant and Stewart show that firm value equals:

$$V = C + EVA / k \tag{2}$$

However, Equation (2) cannot explain how firms with negative EVA add positive value to the firms, resulting in the inconsistency between theory and reality. To reconcile the inconsistency Abate, Grant and Stewart argue that EVA can be generated from two sources - from current assets of the firm and from future assets that are used for future growth opportunities where the combined terms equal: [EVA value created from current assets + EVA value generated by future opportunities]. If EVA_0 defines the EVA value created from current assets and PVG defines the present value of "economic profit improvement attributed to future growth opportunities" or the "EVA from assets not currently in place" [page 64, Abate, Grant and Stewart], then equation (2) becomes:

$$V = C + [(EVA_0 / k) + PVG] \tag{3}$$

Abate, Grant and Stewart explain that firms with negative EVAs can have positive values even if EVA_0 is negative as long as the market perceives their future EVA growth opportunities (PVG) to be positive. Hence Equation (3) helps explain the results documented by Abate, Grant, and Stewart [2004], Grant [1976, 2003] and Zaima [2008]. We, further, analyze four accounting variables documented to impact firm value over the 2004 to 2009 period. By including the accounting variables, we attempt to ascertain whether these accounting numbers correlate to stock returns.

DATA AND METHODOLOGY

The study extracts the annual negative EVA data from the Stern Stewart & Company 2004 database comprised of the top 1000 market value-added (MVA) firms for year-end of 2003. Using Stern Stewart's EVA we identify firms with negative EVAs in 2003, and rank order them from most negative to least negative EVA. Next, the firms are divided into quartiles and we continue to track the accounting data and stock returns for the same firms within each group from 2004 to 2009. Of the Stern Stewart top 1,000 firms we find that 623 firms display negative EVA values in 2003. If EVA values equaled zero when taken to 5 decimal places they were eliminated. It is noteworthy that more than half of the 1,000 top MVA firms exhibit negative current EVAs, and many of the firms with negative EVAs do not survive. We find 174 (or 28%) data are missing in CRSP. Of the 174 deletions 98 are delisted due to mergers while 10 moved to another exchange, 5 liquidated, and 61 are dropped by CRSP. Therefore, we can deduce that the 449 left in the sample are ones that managed to turnaround and survive through 2009.

Table 1 displays the 2003 EVA quartile data for firms with the most negative EVAs (Category 1, C1) as well as the two middle groups of negative EVAs (Category 2, C2 and Category 3, C3) and the least negative EVAs (Category 4, C4). Based on the rankings of EVAs, the firms with the most negative EVAs (C1) show extreme values, ranging from –$9,391 to -$388 while the firms with the least negative EVAs (C4) report EVA values between zero and -$50.

Additionally, Table 1 shows that the net operating profits after taxes scaled by total assets or return on total assets (NOPAT/TA) vary among the categories, C1 to C4. That is, the minimum NOPAT/TA ratio is highest for C4 (-1.44%) as compared to C1 (–2.16%), C2 (-4.10%), and C3 (-7.54%). Additionally, all categories display large differences in negative minimum NOPAT, which equals -$78,780, -$55,631, $30,238, and $2,957, respectively for C1 to C4. The maximum NOPATs diverge also, but the median NOPAT are relatively close. Finally, firms with higher NOPAT, in particular, firms in C1 group appear to be taking advantage of financial leverage as C1 has the highest median and maximum debt ratios of 0.25

and 2.62. In Table 2 a time-series data of NOPAT for each category offer a different perspective, supporting the conjecture that C1 firms engaged in higher investments leading the market to think that they have the potential for higher future EVA from growth opportunities.

Table 1: Description of Firms with Negative EVAs in 2003

Category	C1	C2	C3	C4
	Most negative EVA firms	Second most negative EVA firms	Second least negative EVA firms	Least negative EVA firms
min EVA	- $9,391	- $384	- $142	- $50
median EVA	- $467	- $248	- $119	- $14
max EVA	- $388	- $145	- $51	$ 0
min NOPAT/TA	-2.16%	-4.10%	-7.54%	-1.44%
median NOPAT/TA	0.02%	0.04%	0.03%	0.05%
max NOPAT/TA	3.52%	1.16%	10.03%	16.30%
min NOPAT	- $78,780.00	- $55,631.25	- $30,237.65	- $2,956.80
median NOPAT	$215.60	$191.05	$118.42	$335.50
max NOPAT	$43,288.89	$6,448.04	$70,098.59	$24,297.10
min Debt Ratio (debt/equity)	0	0	0	0
median Debt Ratio	0.25	0.11	0.13	0.27
max Debt Ratio	2.62	1.68	1.64	1.55
Number of Firms	112	112	112	113

Table 1 summarizes annual data of economic-value added (EVA, in millions), Net Operating Profits divided by Total Assets (NOPAT/TA), and total debt divided by equity (Debt Ratio) for each category, C1 to C4. C1 represent firms with the most negative EVAs while C4 correspond to firms with the least negative (close to zero) EVAs. The most recent EVA data in the Stern Stewart 2004 database are for 2003.

Table 2: NOPAT for Categories C1 – C4: 2004-2009

median	**nopat :**	**quarterly**	**data**	
quartile	most negative	second most	second least	least negative
description	eva (c1)	negative eva (c2)	negative eva (c3)	eva (c4)
2004q1*	209.60	157.32	103.70	110.66
2004q2	393.96	166.99	112.31	129.27
2004q3	373.37	188.70	106.28	130.91
2004q4	358.71	204.67	126.71	141.57
2005q1	403.46	194.29	128.59	131.39
2005q2	484.14	199.77	139.14	136.35
2005q3	427.27	187.26	137.88	145.18
2005q4	419.98	232.77	137.63	167.75
2006q1	499.16	237.20	144.98	165.65
2006q2	575.49	283.99	160.96	176.47
2006q3	576.48	247.22	174.99	189.95
2006q4	739.16	315.11	186.94	206.06
2007q1	702.44	305.85	175.42	204.11
2007q2	600.02	290.17	184.17	198.29
2007q3	692.55	347.57	178.54	206.96
2007q4	722.95	393.61	192.63	224.74
2008q1	650.52	338.06	185.66	212.22
2008q2	650.09	387.45	186.47	210.22
2008q3	495.02	414.65	184.81	236.72
2008q4	473.20	406.74	180.76	185.70
2009q1	477.70	316.97	165.59	164.41
2009q2	411.93	231.79	158.50	187.28
2009q3	357.96	347.58	171.50	200.98
2009q4	-111.92	626.20	98.37	186.19

Table 2 provides time series quarterly data of Net Operating Profits (NOPAT) where 2004Q1 denotes first quarter in 2004. The median dollar figures are in millions for each category, C1 to C4 where C1 represent firms with the most negative EVAs while C4 correspond to firms with the least negative (close to zero) EVAs.

As we examine the ex-ante tracking of firms with negative EVAs, they exhibit positive NOPATs. The median NOPAT shows that C1 displays the highest NOPAT ($209.60 in 2004Q1) and the second highest NOPAT is C2 (at $157.32). It suggests that the investment amount (k x C) must be relatively larger for C1 and C2 given that positive NOPAT leads to large negative EVAs. The median NOPAT rises dramatically for C1, going from $209.60 in 2004Q1 to $722.95 in 2007Q4, then declining during the financial crisis to $495.02 (2008Q3), and continuing to decrease to –$111.92 (2009Q4) as the economy continues to struggle. Category C3 exhibits similar behavior but far less exaggerated as it rises from

$157.32 to $393.61 in 2007Q4, and then rebounds in 2009Q4 at $626.20. These results suggest that the firms with negative EVAs appear to fare well during periods of economic growth from 2003 to 2007, but suffer a more dramatic decline from 2008 to 2009.

A final univariate analysis consists of the cumulative portfolio return for each category, C1 through C4. Table 3 reports stock returns for the first quarter of 2004 (or 2004Q1) for each category, C1 to C4, where it equals 2.36%, 3.42%, 5.19%, and 5.92%, respectively. Moreover, the investors appear to be enthused with the potential performance of negative EVA firms as its quarterly returns are greater than the S&P500 return of 1.605%. Examining the time series data we find all four categories peak in 2007Q2 with cumulative returns of 54.39%, 73.58%, 76.65%, and 81.28%, respectively. The S&P500 Index peaks the following quarter at 57.33% in 2007Q3. For the same quarter each category, C1 through C4, exhibits a decline but its cumulative returns are still above the S&P500 Index with returns of 50.07%, 69.63%, 66.54%, 76.09%, respectively. Subsequently due to the financial crisis and the 'recession' that ensued, stock returns declined precipitously until they hit bottom in the first quarter of 2009, resulting in a cumulative return of –36.51%, -19.47%, -25.73%, and –12.72%, respectively for C1- C4.

Table 3: Cumulative Portfolio Returns: First Quarter 2004 (2004Q1) To Fourth Quarter 2009 (2009Q4)

Panel A: Quarterly Portfolio Returns for Each Category C1 – C4

Quartile	Category 1	Category 2	Category 3	Category 4	
Quartile Description	Most negative EVA firms	Second most negative EVA firms	Second least negative EVA firms	Least negative EVA firms	S&P500
2004Q1	0.0236	0.0342	0.0519	0.0592	0.1605
2004Q2	0.0375	0.0531	0.0820	0.0887	0.1756
2004Q3	-0.0622	0.0099	0.0112	0.0767	0.1485
2004Q4	0.1134	0.1787	0.1664	0.2225	0.2489
2005Q1	0.0115	0.1715	0.1412	0.2242	0.2166
2005Q2	0.0472	0.2041	0.1663	0.2570	0.2276
2005Q3	0.0984	0.2744	0.2958	0.3486	0.2663
2005Q4	0.1313	0.3021	0.3439	0.3884	0.2863
2006Q1	0.2656	0.3880	0.4776	0.5152	0.3343
2006Q2	0.2357	0.3668	0.4223	0.4502	0.3089
2006Q3	0.2768	0.3534	0.3748	0.4800	0.3766
2006Q4	0.3973	0.4793	0.5030	0.6166	0.4615
2007Q1	0.4516	0.6008	0.6148	0.6781	0.4641
2007Q2	0.5439	0.7358	0.7665	0.8128	0.5491
2007Q3	0.5007	0.6963	0.6654	0.7609	0.5733
2007Q4	0.3648	0.6049	0.5823	0.6680	0.5131
2008Q1	0.2135	0.3910	0.4483	0.5171	0.3630
2008Q2	0.1896	0.4002	0.5440	0.5038	0.3190
2008Q3	0.0469	0.2276	0.2797	0.4108	0.2019
2008Q4	-0.3182	-0.1645	-0.1946	-0.0302	-0.0692
2009Q1	-0.3651	-0.1947	-0.2573	-0.1272	-0.1778
2009Q2	-0.1606	0.1219	0.2550	0.1764	-0.0527
2009Q3	0.1102	0.4017	0.7196	0.6204	0.0893
2009Q4	0.1886	0.4902	0.9638	0.7066	0.1491

Panel B: Mean Difference of Pairwise Category Portfolio Quarterly Returns

	C1 vs C2	C1 vs C3	C1 vs C4	C2 vs C3	C2 vs C4	C3 vs C4
Mean difference	-0.0083	-0.0275	-0.0142	-0.0191	-0.0059	0.0133
T statistics	-1.1019	-1.6261*	-1.9554**	-1.2959	-0.7364	0.7988

*Table 3 Panel A provides time series quarterly data of cumulative stock returns where 2004Q1 denotes first quarter in 2004. The returns are compounded quarterly for each category, C1 to C4 where C1 represent firms with the most negative EVAs while C4 correspond to firms with the least negative (close to zero) EVAs. Table 3 Panel B presents the t statistics testing the null hypothesis that the mean difference equals zero. The t statistic denoted by ** are significant at the 5% level * are significant at the 10% level.*

The S&P500 Index lost 17.78%, and outperformed all but C4. However, by fourth quarter 2009 all four categories appear to surpass the S&P500 Index, which earned a cumulative return of 14.91%. In contrast, C1 through C4 exhibited cumulative returns of 18.86%, 49.02%, 96.38%, and 70.66%, respectively. These results provide some supporting evidence that firms in C1 do not exhibit higher returns despite

expectations. Table 3, Panel B confirms the fact that C3 and C4 differ from C1. Pairwise differences of the cumulative portfolio returns are statistically different between categories C1 and C3 at the 10% significance level and between C1 and C4 at the 5% significance level. These results suggest that C1 differs significantly from C3 and C4, but not C2.

In summary, the preliminary univariate analyses indicate that there is a relationship between 'ex-ante' portfolio returns (PR) for categories, C1 to C4, and NOPAT/TA. Next, we conduct a multivariate analysis to capture the effect of four accounting variables. The NOPAT/TA ratio is used to measure the return on assets relative to operational profitability while MTB attempts to capture the expected future investment opportunities of firms. DR captures the leverage effect while LTA accounts for the size effect. Finally, dummy variables are utilized to represent each of the categories C1 to C4. We generate dummy variables for C1, C3, and C4 and are interpreted as relative increases in comparison to C2. The resulting regression equation is:

$$PR_{pt} = \alpha + \beta_1 NOPAT/TA_{jt} + \beta_2 MTB_{jt} + \beta_3 DR_{jt} + \beta_4 LTA_{jt} + \beta_5 DC1_{jt} + \beta_6 DC3_{jt} + \beta_7 DC4_{jt} + \varepsilon_{jt} \quad (4)$$

where PRpt is the mean portfolio returns for each category C1 through C4 for each quarter 2004-Q1 to 2009-Q4; NOPAT/TA is the mean NOPAT/TA ratio for each Category C1, C2, C3, or C4 in time t; MTB is the mean Market-to-Book ratio for each Category C1, C2, C3, or C4 in time t; DR is the mean total debt/equity ratio for each Category C1, C2, C3, or C4 in time t; LTA is the Ln(mean total assets) for each Category C1, C2, C3, or C4 in time t; DC1 is a dummy variable equal to 1.0 if the portfolio return belongs to firms in C1, 0 otherwise; DC3 is a dummy variable equal to 1.0 if the portfolio return belongs to firms in C3, 0 otherwise; and DC4 is a dummy variable equal to 1.0 if the portfolio return belongs to firms in C4, 0 otherwise; Finally, we examine whether these relatively high cumulative returns reported in Table 3 exhibit abnormal returns or significant alphas after adjusting for risk as measured by the market portfolio as well as two variables identified by Fama and French (SMB and HML) and a momentum factor generated by Carhart [1997] (MOM). The regression model is:

$$(PR_{pt} - RF_t) = \alpha_{jt} + \beta_1 (MKT_t - RF_t) + \beta_2 SMB_t + \beta_3 HML_t + \beta_4 MOM_t + \varepsilon_{jt} \quad (5)$$

where $(PR_{pt} - RF_t)$ is the portfolio quarterly return premium for category C1, C2, C3, and C4;
(Mkt - RF) is the S&P500 Index return minus the US 30-day T-bill yield; SMB is defined as (Small cap minus Big cap) return measuring premium for size. See Fama and French (1997) for details. HML is defined as (High BTM minus Low BTM) ratios measuring premium for growth. See Fama and French (1997) for details. MOM is the momentum factor developed by Carhart based on portfolio performance in the previous year. It is defined as one half the difference between the average return on the two high prior return portfolios and the average return on the two low prior return portfolios. Fama and French provide the following formula for the computation of the momentum factor: MOM = 1/2 (Small High + Big High) - 1/2(Small Low + Big Low). The prior returns are computed using 2-12 months before the test period.
Should the market expectation of future EVA generating high growth opportunities prevail we should find positive and statistically significant alphas.

RESULTS AND DISCUSSION

The empirical results of the multiple regression analysis are presented in Table 4. The results from the regression exhibit a relatively strong R-squared (28.3%), but NOPAT/TA is not statistically significant. Although there were strong potentials for firms with negative EVAs to generate profits based on its investments in 2003, the results do not support it. Moreover, the ex-ante portfolio returns do not correlate

significantly to MTB ratio. If MTB ratio is used as a proxy for the market's assessment of the firms' future investment opportunities, the results show that a significant relationship between stock performance and future investment opportunities is inconclusive for negative EVA firms.

Table 4: Regression on Quarterly Portfolio Returns

Variable	Estimated Coefficient	PR > |t|
Intercept	-0.0059	0.9914
NOPAT/TA	-0.1057	0.5843
MTB	0.0086	0.1723
Debt Ratio (DR)	-2.6417***	<0.0001
Size (LTA)	0.0903	0.1446
DC1	0.1119	0.3385
DC3	0.1455**	0.0467
DC4	0.2529***	0.004
R-squared	28.31%	
Sample size	96	

This table displays the results of the regression estimates of the equation: $PR_{pt} = \alpha + \beta_1 NOPAT/TA_{jt} + \beta_2 MTB_{jt} + \beta_3 DR_{jt} + \beta_4 LTA_{jt} + \beta_5 DC1_{jt} + \beta_6 DC3_{jt} + \beta_7 DC4_{jt} + \varepsilon_{jt}$. *The coefficient estimates are presented in the cells with statistical significance denoted by *** for the 1% level and ** for the 5% level.*

However, debt ratio is statistically significant at the 1% level. The debt ratio is negatively correlated to the returns indicating that lower debt ratios result in higher returns. The result illustrates the market's reluctance to lend to relatively risky firms with current negative EVAs, and supports the ones that borrow conservatively. Therefore, the market appears to reward caution as opposed to managers who take on more debt. Moreover, size measured by LTA is not statistically significantly correlated to ex ante portfolio returns. Although size is typically significant our results indicate that firms with negative EVAs do not display a significant correlation between size and returns. Interestingly, the market recognizes that the level of negative EVA affects portfolio returns. Firms that exhibit the smaller negative EVAs are significantly correlated with higher ex-ante portfolio returns. The dummy variable for C3 is statistically significantly correlated to its portfolio returns at the 5% level while the dummy variable for C4 is significantly correlated to returns at the 1% level. That is, firms with the least negative EVAs appear to have overcome the stigma of negative EVAs and generated higher than average ex-ante portfolio returns over and above C2's returns. Firms with negative EVA in Category C3 show a 14.55% premium while the least negative category, C4, display a 25.29% premium return relative to C2.

In summary, we find that negative EVA firms are different from other firms. Although past studies show a correlation between stock portfolio returns and NOPAT/TA, MTB, and size, negative EVA firms do not. More specifically, even if some managers' efforts result in higher NOPAT/TA and MTB, the relationship, on average, cannot be ascertained even when we follow the firms over six years (2004-2009). Perhaps, the volatility associated with negative EVA firms and their accounting variables makes it difficult to create a clear linkage between the two. Debt ratio, on the other hand, is statistically significantly related to the returns, suggesting that firms with low leverage are likely to exhibit higher returns in the future. Finally, we conduct a portfolio performance analysis to determine whether the portfolio returns of C1 to C4 display abnormal risk-adjusted returns by applying regression equation (5). The premiums in equation (5) measure the relative difference between factors that impact excess portfolio returns, (PR-RF). The market risk premium (Mkt – RF) incorporates the beta or market risk while SMB captures the market-value size premium. HML captures the market's perception of growth versus value stocks or performance premium. MOM measures the momentum of the performance premium calculated over the previous ten months.

Table 5 displays the results for the four portfolio returns, and demonstrates that they are significantly correlated to the market risk premium, (MKT – RF), size premium (SMB), growth premium (HML), and momentum premium (MOM). The different results from Tables 4 and 5 can be attributed to three factors.

First, Table 4 uses total assets to measure size instead of market capitalizations used in SMB. Second, portfolio returns, PR, may not show statistical significance to the level of MTB, but it does to the relative MTB (or HML). Finally, an inclusion of the market risk premium and momentum add another dimension to the relationship, showing that negative EVA firms correlate to the four market factors even though they do not correlate to accounting variables.

Table 5: Quarterly Portfolio Performance

Dependent variable (PR_{pt}-RF_t)								
	Most negative Category 1 (C1)		Second most negative Category 2 (C2)		Second least negative Category 3 (C3)		Least negative Category 4 (C4)	
Variable	Estimate	Pr > |t|	Estimate	Pr > |t|	Estimate	Pr > |t|	Estimate	Pr > |t|
Alpha	0.0000	0.9882	0.0002	0.1400	0.0003**	0.0267	0.0002**	0.0308
MKT- RF	1.1022***	<.0001	1.1189***	<.0001	1.1444***	<.0001	1.07133***	<.0001
SMB	0.3198***	<.0001	0.3991***	<.0001	0.5675***	<.0001	0.5323***	<.0001
HML	-0.0700***	0.0039	-0.0186	0.4708	0.0612**	0.0120	0.0904***	<.0001
MOM	-0.1967***	<.0001	-0.1648***	<.0001	-0.1619***	<.0001	-0.1446***	<.0001

*This table displays the results of the regression estimates of the equation: $(PR_{pt} - RF_t) = \alpha_{jt} + \beta_1(MKT_t - RF_t) + \beta_2 SMB_t + \beta_3 HML_t + \beta_4 MOM_t + \varepsilon_{jt}$. The coefficient estimates are presented in the cells denoted by ***, **, * for statistical significance at the 1%, 5%, or 10% level, respectively.*

However, the main results persist. That is, we find that the alphas are statistically significant for firms in C3 and C4 (.000275 for C3 and .000186 for C4) while alphas are not significant for C1 and C2. Despite the capital investments in 2003 by firms in C1 (the most negative EVA firms) its expected strong performance does not materialize. Similar outcome exists for firms in C2, the second most negative EVA firms.Our findings show that only negative EVA firms in C3 and C4 earn significant excess returns and are statistically different from C2 (and C1). Unfortunately, even after some time has passed from the point where negative EVAs are measured (2003) we cannot find a relationship between the returns of the negative EVA firms and the accounting variables, NOPAT/TA, MTB nor Ln(total assets). However, we find that there is a negative correlation between debt ratio and returns. The reason for the poor correlation can be attributed to the high volatility of accounting variables for negative EVA firms, demonstrating that these firms generate significant "noise".

CONCLUDING COMMENTS

Our study examines how firms with negative EVA fare in the future despite its current negative EVA values. This is especially anomalous because many firms with current negative EVAs generate higher stock returns than firms with current positive EVAs. We take the firms with negative EVAs in 2003 from the Stern Stewart database, and split them into four categories, C1 (quartile with the most negative EVAs) to C4 (quartiles with the least negative EVAs). We test to determine whether four accounting variables might explain how these firms perform in the future periods 2004-2009. Using regression analysis we test whether the accounting variables and the four categories might differentiate future stock performance.
Utilizing regression analysis, the study found that we cannot rely on NOPAT, MTB or size as indicators to future performance for firms with negative EVA values. However, debt ratio is correlated to firm performance and generally, firms with the least negative EVAs display a stronger likelihood of turning around. Furthermore, our results show that the firms with the least negative EVAs (or C3 and C4) are more likely to exhibit significantly higher returns compared to firms with the most negative EVAs (C1 and C2). Finally, using the Fama-French four factor model, we find that firms in C3 and C4, or the least negative EVAs are more likely to outperform the market. The implications of the study indicate that investors considering to invest in negative EVA firms should invest in firms with 'near zero EVAs' with relatively low leverage as they appear to turn around and more importantly, earn abnormal returns. Future research might concentrate on these firms with 'near zero' EVAs to conduct a more in-depth analysis on them.

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