Value Relevance of EVA and traditional measures of

Financial performance after global financial crisis

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ABSTRACT

In this paper, the relationship between variables economic value added (EVA) , earnings per share (EPS) , return on investment (ROI), operating cash flows (OCF) and shareholders' value i.e. Market value Added (MVA) is studied. The study interprets results obtained from an analysis carried out on the basis of secondary financial data relating to the period 2003-2013. The research is inferential-inductive in terms of methodology and is cross-sectional correlation in terms of test statistical method. The studied statistical population consists of all the companies listed in Bombay Stock Exchange. The statistical sample consists of 100 companies. Multi-variable regression methods are used to test the hypothesis. The results indicate that both economic value added and Operating cash flows have significant relationship with the shareholders' wealth i.e. MVA. However, the operating cash flows is more significant than the economic value added in relation with the shareholders value. Both relative and incremental content approaches have been tested. Relative information content tests revealed that shareholders' value are more closely associated with OCF than EVA. On the other hand, incremental information content tests provide evidence that EVA adds significant explanatory power to OCF in explaining shareholders' value.

Key words: Economic Value Added (EVA), Market Value Added (MVA), Operating Cash Flows (OCF)

Introduction

Shareholder Value Creation has become the widely accepted corporate mission, but debate is there for its measurement level. As companies intensify to fulfill their vision of creating value for their shareholders, the obvious question is that which measurement metric is best among all. Investors and even most companies tend to focus too much on size and income based metrics such as share price (market value or market capitalization), earnings, growth in earnings,

earnings per share (EPS), return on capital employed (ROCE) and return on equity(ROE). But biggest flaw with such metrics is that they don't consider the cost of equity capital and are influenced by accrual accounting based conventions. Due to which these traditional measures have been regularly criticized as misleading, manipulative and incompetent to disclose an organization's value creating performance.

US-based Consultancy firm Stern-Stewart & Company claimed that earnings, earning per share (EPS) and earnings growth are misleading measures of corporate performance and the best practical periodic performance measure is Economic Value Added (EVA). Stewart (1991) argued that EVA better captures the true economic profitability of an enterprise and is directly linked to the shareholder value . To further support his claim, Stewart (1994) provided empirical evidence that EVA stands as the single best measure of wealth creation and is almost 50% better than its closest accounting based competitors (including EPS, ROE and ROI) in explaining changes in shareholder wealth.

The proponents also claimed that mathematically, the EVA of a company is the net present value (NPV) of all its future EVAs. Thus, a company that continues to improve economic value added, year after year, will sooner than later, find favor with investors. Thus, over the long term, it is an improvement in EVA and not in accounting results that derives wealth creation. That is one reason why companies world over need to focus on improving their fundamental economic performance as measured by EVA. The literature for the relationship between EVA and Market Value involves a considerable debate regarding the superiority of EVA in comparison to the traditional performance measures like return on investment (ROI), earnings per share (EPS),return on capital employed (ROCE) etc.

Review of Literature

Most of the studies regarding EVA literature have focused on the comparison of traditional measures of financial performance with that of the value-based measures (Bacidore *et.al.*1997; Biddle *et al.* 1999; Roze *et.al* 2013). Besides this, studies have also been done to examine the relationship between EVA and stock returns (Lehn and Makhija 1996;Milbourn and Garvey 2000;Tortella and Brusco 2000). Rice, V.A. (1996) observed that EVA emphasized that every investment produces return that exceeds cost of capital and this approach enabled to directly align management and shareholders interest. Thenmozhi, M. (2000) comparing EVA with other traditional performance measures found that all the companies depict a profitable picture in terms of EPS, RONA and ROCE for all the three years in the study. The study shows that the traditional measures do not reflect the real value of shareholders and EVA has to be measured to have an idea about the shareholders value. In a study conducted to determine the relationship between a firm's market value with EVA and traditional accounting criteria such as ROA, ROE and EPS in the United States in the period of 1986-1995, Uyemura et al. (1996) concluded that EVA had more correlation with the firm's market value in comparison with other criteria. Zaima *et al.*(2005) examined the relationship between EVA, GDP and MVA in the United States between 1988 and 1997. They found a positive and significant relationship between EVA, GDP and MVA. Ramana (2004), in an investigation performed between 1999 and 2003, examined the relationship between MVA and EVA with traditional accounting criteria through a correlation test. The results revealed that net operating profit after tax (NOPAT) and net profit after tax could explain changes of the firm's market value better than EVA.

Abzari *et al.* (2008) evaluated the performances of the firms in the Base Metals companies in Tehran Stock exchange and examined their relationships with accounting earnings criteria. They found no significant relationship between EVA and accounting indicators. Pooyanfar *et al.*(2010) studied the relationship between accounting and economic criteria with firms' values in Cement and Petrochemical Industries in Tehran Stock exchange. They found a high correlation between EVA and NOPAT in petrochemical industry.

Hejazi and Hosseini (2006) compared the relationships between MVA and EVA with accounting criteria in Tehran Stock Exchange and found a strong correlation between MVA and EVA as compared to accounting criteria. Ghanbari (2007) studied the relationship between EVA and MVA in member companies of Indian Automobile Industry between 2001 and 2005. Results indicated that EVA was a suitable criterion to describe MVA and to evaluate firms' performance. Yahyazadeh Far *et al.* (2010) examined the relationship between EVA and profitability ratios with MVA of the enlisted firms of Tehran Stock Exchange. Results indicated a significant relationship between EVA, ROE, and MVA; but not between ROA, EPS and MVA.

Research Methodology

The present study is regarding the relationship between shareholders' value and EVA and traditional measure of performance i.e. EPS, ROI and OCF. The data was taken for five years prior to financial crisis 2008 and five years after financial crisis 2008 i.e. data from 2003-2008 and 2008-2013. The study was confined to top 100 companies listed on BSE ranked according to their market capitalization. Initially, top 200 companies were selected, listed on BSE. The companies which do not meet the specified criteria were identified and eliminated. At first, from the top 200 companies' list, Banks, Financial Institutions and NBFCs were excluded to prevent

distortions in the comparisons. As the second criteria, companies, for which complete financial information for the last years (i.e. 2003-2013) is not available, were excluded. Thus, after applying above filters, the resultant sample of 100 companies were taken.

The study was on the basis of secondary data which was collected from the annual reports and web sites of the selected companies. The data was also collected from prowess, a data base of CMIE .

Choice of Variables Four independent financial variables are chosen for the purpose of the study, of which three represent Accounting based traditional performance measures, one is Value Based Performance Measure. Accounting based performance measures includes Return on Investment (ROI), Cash flows from operations (OCF), Earning per Share (EPS) whereas Value based measure is Economic Value Added (EVA). For testing the hypothesis, Market Value Added (MVA) has been taken as the dependent variable. A brief description of all these variables is given below:

Market Value Added (MVA): MVA being an absolute measure assesses that how much capital a company has added to or subtracted from its shareholder's investment. MVA thus, measures the value added by the management over and above the capital invested in the company by its shareholders and lenders.

   Mathematically, MVA = Market Value of the firm – Economic Capital

Earning per share (EPS)

EPS is an absolute measure of profitability that identifies how much each share has earned for the shareholders. Investors, in general, look upon earnings per share as the best yardstick to analyze their investment decisions. It is calculated by the formula:

Net profit after tax – Preference dividend

EPS = Total number of Outstanding Equity shares

Economic Value Added (EVA)

EVA is conceptually a superior measure of performance because it charges management for using capital at an appropriate risk-adjusted rate, and it eliminates financial and accounting distortions to the extent it is practical to do so (Stewart, 1994). Operationally defined,

$$EVA = NOPAT – Capital\ charge = NOPAT – WACC \times Economic\ Capital$$

Where, NOPAT is Net Operating Profits after adjusting for non-operating items, non-recurring events and other economic adjustments to compute economic profits from accounting profits.

NOPAT = (PAT + non-recurring expenses + revenue expenditure on R & D + interest expense + goodwill written off + provision for taxes) - non-recurring income - R & D amortization – cash operating taxes.

WACC = Weighted average cost of capital. = Cost of equity × proportion of equity in total capital + Cost of debt × proportion of debt in total capital (1 – tax rate) + Cost of preference capital × proportion of preference capital in total capital.

Economic Capital = Net Fixed Assets + Investments + Current Assets – (NIBCLs + Miscellaneous Expenditure not written-off + Intangible Assets) + (Cumulative Non-Recurring Losses + Capitalized expenditure on R & D + Gross Goodwill) – Revaluation Reserve – Cumulative Non-Recurring Gains

Return on Investment (ROI)

ROI tries to directly measure the amount of return on an particular investment, relative to the investment's cost. To calculate ROI, the benefit (or return) of an investment is divided by the

cost of the investment. The result is expressed as a percentage or a ratio.The return on investment formula:

ROI = (Gain from Investment - Cost of Investment) / Cost of Investment

 Operating Cash Flows (OCF)

Operating cash flows usually refers to the net **cash** inflow reported in the first section of the statement of **cash flows. Operating cash flows** focuses on the **cash** inflows and outflows from a company's main business **activities** of buying and selling merchandise, providing services, etc.

Model Development

The next methodological requirement is to specify the regression model used to compare the relative information content of the competing measures of firm performance (Value Based Measures as well as Traditional Financial Performance Measures) on the basis of their association with MVA. The following model has been selected for the purpose of Multivariable Regression Analysis

$MVA_{it} = \alpha + \beta_1 EVA_{it} + \beta_2 EPS_{it} + \beta_3 ROI_{it} + \beta_4 OCF_{it} + e_{it}$ ……………. Equation

The dependent variable in the above equation is the Market Value Added (MVA) for firm *i* in period *t*. The explanatory variables in the model are Economic Value Added (EVA), Earning Per Share (EPS), Return on Investment (ROI) and Operating Cash flows (OCF). Following the literature on the relative information content of various firm performance measures, the hypothesis suggests positive coefficients for EVA, EPS, ROI and OCF when specified as explanatory variables for MVA. It also suggests that the more closely these measures

approximate market value addition, the higher will be the relative information content of these measures. This model is estimated using a Multivariate Regression

Table 1.1   Descriptive

Statistics

	N	Mean	Median	Std. Deviation	Minimum	Maximum
mva	1100	132520.0427	38645.1050	287594.50092	-142700.01	2809997.04
eva	1100	530193.4719	128521.4003	1935009.01728	-8365424.04	19603008.67
EPS	1100	34.2499	18.4100	87.97694	-191.09	1890.46
ocf	1100	12652.1082	3598.0000	34877.35360	-231987.50	370509.60
roi	1100	23.7017	20.8800	66.64767	-672.28	1519.28

. Table 1.1 presents a summary of the descriptive statistics of the dependent and independent variables used in the study. The table presents the number of variables in the sample, their means, median, standard deviation, minimum value and maximum value. The dependent variables MVA has minimum value of -142700.01 and maximum value of 2809997.04 respectively. The Standard deviation for EPS,EVA,ROI and OCF are 87.97694, 1935009.01728, 66.64767 and 34877.35360 respectively.EVA has minimum values of -8365424.04 and maximum value of 19603008.67 respectively. EPS,OCF and ROI have minimum values of -191.09, -231987.50 and -672.28 and maximum values of 1890.46, 370509.60 and 1519.28 respectively.

Correlations

Table 1.2

	mva	eva	EPS	ocf	roi
mva	1	.637**	.065*	.653**	.029
eva		1	.100**	.746**	-.035
EPS			1	.071*	.010
ocf				1	.003
roi					1

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

The Correlation matrix in table 1.2 provides the relationship between EVA, MVA, ROI , OCF and EPS for the period 2003-2013.Correlation is an extremely useful tool to estimate the strength of relationship between the corresponding pair of variables in a correlation matrix. The analysis of the table reveals that highest positive relationship exists between EVA and OCF at .746 and it is highly significant also. This means with an increase in OCF , there would be an increase in EVA also. The similar positive relation is observed between EVA and MVA as well as between EVA and EPS and the relationship is significant too. As far as correlation among independent variables is concerned, the maximum correlation can be observed between EPS and OCF at .071 which is much lesser than the prescribed rule of thumb of 0.8 (Gujarati,1999). Hence, it shows that multicollinearity does not exist in the selected regression model. In addition the study also considers Average Variance Inflating Factor (VIF) to detect multicollinearity. Durbin –Watson Statistics has been employed to check the assumption of independent errors. The Robustness is checked to ensure that coefficients are not heteroscedastic.

Model	EVA			EPS			OCF			ROI			F	Adj R^2
	Estimated coefficient	Standard error	t-statistics	Estimated coefficient	Standard error	t-statistics	Estimated coefficient	Standard error	t-statistics	Estimated coefficient	Standard error	t-statistics	F	Adj R^2
I	.637	.003	27.356 .0001										748.356 .0001	.405
II				.065	98.444	2.158 .031							4.658 .031	.003
III							.653	.188	28.584 .0001				817.o49 .0001	.426
IV										.029	130.169	.974 .330	.948 .33	.001
V	.637	.003	27.201 .0001	.001	76.495	.056 .955							373.840 .0001	.406
VI	.638	.003	27.465 .0001							.052	100.306	2.217 .027	377.968 .0001	.407
VII	.337	.005	10.264 .0001				.402	.271	12.251 .0001				500.020 .0001	.476
VIII				.019	74.899	.825 .410	.652	.189	28.450 .0001				408.746 .0001	.427

Model														
IX				.065	98.453	2.149 .032				.029	129.961	.954 .340	2.784 .062	.003
X							.653	.188	28.585 .0001	.027	98.588	1.191 .234	409.390 .0001	.426
XI	.340	.005	10.321 .0001	.002	71.709	.108 .914	.399	.271	12.167 .0001	.040	94.330	1.822 .069	251.149 .0001	.477

Table 1.3

Table 1.3 presents the estimated coefficient , standard errors, t-statistics, F-test and Adjusted R^2 for each model. Here, the dependent variable is MVA and explanatory variables are EVA , EPS, ROI and OCF. The first four models (I to IV) present the results of the univariate association of each independent variable with the dependent variable MVA.In the next six models (V to X), independent variables are specified in pair-wise combinations and finally considered jointly in the last model(XI).

Results and Discussion

Table 1.3 Model XI provides that the variability in the MVA accounted for by the four final predictors comes out to be .478 (R^2). A high and positive value of Adjusted R^2 at .477 verifies that the cross- validity of this model is very good. F-statistic is found to be large (251.149) and significant (at 1% level). The results also show that all the selected independent variables i.e. EVA, EPS, ROI and OCF have positive slope coefficients (i.e. β values) showing their positive association with MVA. However, tested on the basis of t-statistic, just two independent variables i.e. EVA and OCF are identified as the significant predictors of MVA at 1% confidence level (p<.001). On the other hand EPS and ROI do not seem to have established a significant statistical association with MVA. As explained earlier, multicollinearity is also not a concern in the model and has properly been accounted for. Thus, the above indicators claim the regression model to be statistically fit and valid.

Table clearly shows that OCF is the most significant predictor of MVA when it is considered univariately as well as when paired with EVA. Similarly, EVA is also found to be significant by itself and when compared with OCF. The pair-wise regressions that best explain the variations in MVA are EVA/OCF (47.6%), OCF/EPS (42.7%), OCF/ROI (42.6%), EVA/ROI (40.7%), EVA/EPS (40.6%). Here, EVA comes once among the best three pair-wise regressions which evidence EVA is not highly significant explanatory variable. However, Cash from operating activities(OCF) can clearly be observed as the best predictor of MVA and is thus, recognized as the most legitimate and reliable measure of shareholder value creation. Further, OCF is followed by EVA, which depicts a slightly less explanatory power of 40.5% in comparison to 42.6% for OCF. These results show that traditional measure of performance has emerged as the more dominating determinants of MVA during the study period.

Relative information content comparisons are appropriate when one desires a ranking of performance measures by information content or when making mutually exclusive choices among performance measures i.e. when only one measure can be chosen. In contrast, Incremental information content comparisons assess

whether one measure provides value-relevant inferences beyond those provided by another measure, evaluating the benefit of supplemental disclosures in financial reporting (Biddle et al., 1997).

Table1.4

Panel A: Results of Relative Information Content Test

<div align="center">

OCF > EVA > EPS > ROI

42.6% >40.5%> 0.3% >0.1%

</div>

Panel B: Results of Incremental Information Content Test

OCF/EVA	OCF/EPS	OCF/ROI	EVA/ROI
47.6-40.5	42.7-0.3	42.6-0.1	40.7-0.1
7.1%	42.4%	42.5%	40.6%
EVA/EPS	EPS/ROI	EVA/OCF	EPS/OCF
40.6-0.3	0.3-0.1	47.6-42.6	42.7-42.6
40.3%	0.2%	5%	0.1%
ROI/OCF	ROI/EVA	EPS/EVA	ROI/EPS
42.6-42.6	40.7-40.5	40.6-40.5	0.3-0.3
0%	0.2%	0.1%	0%

Table 1.4 presents the summary results of regressions based on the Relative and Incremental Information Content Tests. Panel A of the table summarizes the significant differences in the relative information content of different measures. The results of univariate regressions show that R^2 (OCF) > R^2 (EVA) > R^2 (EPS) > R^2 (ROI), where R^2 depicts the percentage variation in MVA , as explained by each particular explanatory variable.

Results of Incremental Information Content Test

The results in Panel B of table 1.4 provide the results of incremental information content tests for the pair-wise comparisons of all four explanatory variables .For this purpose, the adjusted R^2 of earlier univariate

regressions have been subtracted from the adjusted R^2 of each pair-wise regressions to know the incremental information provided by each explanatory variable in relation to other variables.

Table clearly shows that OCF is the most significant predictor of MVA when it is considered univariately as well as when paired with EVA. Similarly, EVA is also found to be significant predictor of MVA univariately.

 For instance, in panel B, OCF/EPS (42.4%) is equal to the information content of the pair wise comparison of OCF and EPS (42.7%) minus the information content of EPS (0.3%) from table. Looking at the pair wise combinations, it can be observed that over the OCF measure alone, explanatory power has increased by 42.5% and 42.4%. Similarly the explanatory power has improved by 40.6% and 40.3% respectively over the EVA measure alone. Combining both of these measures i.e. OCF and EVA, the incremental information content of OCF (7.1%) is slightly more than the incremental information content of EVA (5%).

 As far as the comparison between value based and accounting based measures is concerned, the results clearly depict that explanatory power improves by 40.6%, 40.3% and 5 % respectively over the EVA measure alone. Although it is lesser than the incremental information provided by the traditional measures OCF , yet it provides the most logical pairing of information variables in explaining MVA i.e. Models VI (that best explains MVA) and XI (all variables considered jointly). Thus individually, EVA explains as much as 40.5% of the variation in MVA and in combinations, it also evidences increment information content (although lesser than that of OCF). Thus, the results provide the sufficient evidence that traditional measures of firm performance i.e. OCF is highly associated with its shareholder value creation as measured in terms of MVA. Finally, the present study denies the hypothesis of equal relative and incremental information content and identifies that Cash from operating activities dominate EVA (the Value Based Measure) in explaining the variations in firm value and hence shareholder wealth.

Potential Factors Contributing to the Failure of EVA to Dominate Traditional   Performance Measures

The present study finds no clear evidence to support Stern & Stewart's claim that EVA is superior to the traditional performance measures in its association with MVA. On the contrary, the evidence suggests that the Indian market seems more focused on cash flows from operating activities than value based measure EVA. The study empirically finds that although EVA and OCF both depict highly positive and significant association with MVA yet OCF's explanatory power is greater than the explanatory power of EVA. Further, the results also provide the sufficient evidence that traditional measures of firm performance OCF is highly associated with its shareholder value creation as measured in terms of MVA. That means Indian market is more responsive to accounting based metrics .

As the key findings of the study evidence the OCF's superiority to EVA in relative information content test (in their association with MVA), the study identifies the potential factors contributing to the failure of EVA to dominate traditional measures of performance in explaining the variations in shareholder value creation. Kramer and Peters (1997) explained that with the market being fed almost constant news on earnings, it is not surprising that it is not much responsive to EVA in the short-run. Another reason might be that accounting adjustments and estimates of the capital charge given by the proponents may contain measurement error relative to what the market uses for valuing firms. Biddle et al. (1999) observes that in attempting to estimate economic profits, adjustments made by Stern & Stewart may remove accruals that market participants use to infer firm's future prospects. Thus, while computing EVA, the true measure of company's economic profitability is determined but its association with market returns is lost. Moreover, another reason for the comparatively weak value- relevance of EVA might be the prevalent financial crisis due to which more emphasis on cash from operations. Biddle et al. (1999) viewed that some adopters of EVA feel that they must still base their external performance on earnings because this is the measure on which financial analysts continue to focus. As a result, market fails to recognize the reporting benefits of EVA. However, the present study does not question the effectiveness of EVA because in spite of non-availability of detailed financial data required for EVA related computations and non-mandatory disclosure of EVA Statements in annual reports of Indian Companies, market seems to be quite responsive to EVA performance of a company. Thus, the findings advocate adoption of EVA for management compensation, external communication and security analysis and also suggest disclosure of EVA in financial reporting, to

align management objectives with shareholders' interests and facilitate value-based performance monitoring.

Conclusion

Analyzing a pooled time series, cross-sectional data of 100 Indian companies for a period from 2003 to 2013. This study has attempted to examine whether the value based measures of firms performance are more highly associated with firm's MVA than other long established traditional measures. The results indicate that the variability in the MVA accounted for by the four final predictors comes out to be 47.7% (adjusted R^2). However the study found no clear evidence to support Stern & Stewart's claim that EVA is superior to the traditional performance competitors in its association with MVA. The empirical evidence suggests that due to financial crisis Indian market seems to be more focused on cash from operations than value based measure EVA. Relative tests show the dominance of OCF over EVA; and incremental tests find that solely accounting based measures provide considerable and significant additional information, whereas EVA provides comparatively lower incremental information. Thus, Indian market being less responsive to EVA than OCF needs more ongoing investigation.

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