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**RESULTS & DISCUSSION** 

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 Schemenner, R.W., Huber, J.C. and Cook, R.L. (1987), "Geographic Differences and the Location of New Manufacturing Facilities," Journal of Urban Economics, Vol. 21, No. 1, pp. 83-104.

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# EVA AND MVA: WHICH METRIC IS EXTREMELY EFFECTIVE IN EXPLAINING REPORTED EARNINGS? – AN EMPIRICAL STUDY ON SELECTED INDIAN FIRMS

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#### **ABSTRACT**

Economic Value Added or EVA, is a performance metric used to estimate the true economic profit produced by a firm while Market Value Added or MVA is a wealth metric that measures the level of value a firm has accumulated over time. Both are value based financial performance measure. But when question arises on their explanatory power several researchers have claimed that EVA is highly significant in explaining its relationship with reported Earnings than that of MVA while some other researchers argued that MVA is more significant in explaining its relationship with reported earnings rather than EVA. Various studies have been conducted in this regard till date but the research results are quite mix and at variance. Thus, a modest attempt has been made to examine the relationship between Economic Value Added and Market Value Added with reported earnings in various regression models. Several hypotheses have been tested statistically in order to elucidate the findings and inferences of the study. 30 Indian firms listed in Bombay Stock Exchange for the period from 1st April 2008 to 31st March 2011 have been considered here as sample for carrying out the study. Simple mathematical tools like ratio, percentage, average etc. and various statistical techniques and statistical tools like Pearson's simple correlation, multiple correlation, simple regression, multiple regression techniques and 'F' test etc. have also been applied at appropriate places for analysing the data used in the study. This study divulges that MVA is more significant and effective in explaining its relationship with reported earnings rather than EVA.

#### **KEYWORDS**

Economic Value Added (EVA), Market Value Added (MVA), Reported Earnings (Net Income), Bombay Stock Exchange (BSE).

#### **INTRODUCTION**

he final aim of implementing a performance measurement system is to improve the performance of the organisation. If a suitable performance measurement system is adopted by the firm, then the information generated through the system will help the firm in measuring its actual status. Thus, the most important challenge before the organisations is to select or to choose the right financial performance measurement system (Ittner C.D., 1998). Erroneous selection of performance measures fails to provide correct information and as a consequence to that the firm will not be able to take optimal decisions which ultimately lead to create negative impact on its valuation. Therefore, while selecting performance measures organisations should be very much careful about its implications.

Modern value-based performance measures such as **Economic Value Added** or **EVA** and **Market Value Added** or **MVA** has gained much popularity since the late 1980s (*Rappaport, 1986; Stewart, 1991*), and thereby, the Value Based became increasingly accepted both as a decision making tool and as a performance measure tool (*Knight, 1998*) because the creation of shareholder value has become an increasingly important demand among shareholders. Economic Value Added or EVA is a performance metric used to estimate the true economic profit generated by a firm while Market Value Added or MVA is a wealth metric that measures the level of value a firm has accumulated over time. Since EVA and MVA both are value based financial performance measure but when the question arises on their explanatory power in relation to reported earnings several researchers have claimed that EVA is highly significant in explaining its relationship with reported Earnings than that of MVA while some other researchers argued that MVA is more significant in explaining its relationship with reported earnings rather than EVA.

In light of above problem statement some research motivational queries arise such as -

- How far the variability in reported earnings is explained by EVA and MVA?
- Which metric will be more effective and reliable in order to predict the trends of reported earnings?
- > Which metric will be more useful for investors and shareholders in order to make strategic decisions and investments?

Thus, the title of the paper is -

"EVA and MVA: Which metric is extremely effective in explaining Reported Earnings? – An empirical study on selected Indian firms."

#### **REVIEW OF EXISTING LITERATURE**

One of the most contentious questions among the researchers on financial performance measures is "How far modern corporate financial performance measures are extremely effective in explaining its relationship with Reported earnings". Several empirical studies have been conducted over last few decades regarding this question but the question is still unresolved and debatable among the researchers and academicians. A swift gaze through the existing literature on this important issue seems appropriate before pacing the empirical study. Uyemura et al. (1996) used a sample of the 100 largest US banks for the ten-year period from 1986 to 1995 to calculate MVA and to test its relationship with EVA, along with four other accounting measures (viz., NI, EPS, ROE and ROA). By regressing changes in standardised MVA (defined as MVA divided by Invested Capital) against changes in standardised EVA (defined as EVA divided by Invested Capital) and traditional performance measures, (EPS, NI, ROE and ROA) they concluded that the correlation between MVA and those measures are: EVA 40%, ROA 13%, ROE 10%t, NI 8% and EPS 6%. This indicates that Market is not more likely to react favorably to net income. Kramer and Pushner (1997) studied the strength of the relationship between EVA and MVA, using the Stern Stewart 1000 companies for the period between 1982 and 1992. They found that MVA and NOPAT were positive on average but the average EVA over the period was negative. The regression between the levels of MVA and the levels of EVA yielded an r<sup>2</sup> of 10%, which was significant, but left a large part of the MVA unexplained. So they proceeded to run regressions of MVA for the same period and lagged levels of EVA and NOPAT. The study found that changes in EVA were negatively related to changes in MVA, while the correlation between changes in MVA and changes in NOPAT was positive. This indicates that the market is more likely to react favorably to profits than to EVA, at least in the short term. Hence, they found no clear evidence to support superiority of EVA over MVA in explain reported earnings. Wibowo and Berasategui (2008) used a sample of 40 listed companies in Indonesian stock exchange for the year 2004-2007 to examine the relationship between Economic Value added and Market Value Added with reported earnings. The study reveals that 30.09% of variability in reported earnings in the same year is explained by EVA while 80.60% of variability in reported earnings in the same year is explained by MVA. Biddle et al. (1999) shows that when they applied some adjustment in a consistent manner they found a better correlation between net income and MVA than with EVA regression. Therefore, there is still no clear evidence that EVA can be used as effectively as MVA in explaining the Reported Earnings.

#### THEORETICAL FRAMEWORK

#### Reported Earnings (Net Income)

Reported earnings or net income is the remainders after all expenses have been deducted from revenues. While it indicates the profitability of the company, it also reflects the return to equity holders for a specific period of time.

Mathematically,

Net income or Net loss = Revenue - Cost of goods sold - Expenses + Non operating income - Non Operating expense - Income Taxes.

#### **Economic Value Added (EVA)**

EVA is the measure of the true economic profit of a firm. It is a measure of a company's financial performance based on the residual wealth calculated by deducting cost of capital from its operating profit *Mathematically*,

EVA= Adjusted NOPAT –(capital employed x WACC) "Or"

EVA = (Rate of return - cost of capital) x capital employed

Where,

NOPAT= Net Operating Profit after Taxes

WACC = Weighted Average Cost of Capital

Rate of Return = NOPAT/Capital Employed

Capital Employed = total assets minus noninterest bearing debt, at the beginning of the year

Cost of capital = cost of equity x proportion of equity + cost of debt (1-tax rate) x proportion of debt in the capital. The cost of capital is nothing but the weighted average cost of capital (WACC) Cost of equity is normally estimated using capital asset pricing model (CAPM).

Economic Value Added (EVA) is important because it serves as an indicator and reflector of management performance. A negative EVA indicates that the business firm did not make enough profit to cover the cost of performing business.

#### MARKET VALUE ADDED (MVA)

MVA is simply the difference between the current total market value of a company and the capital contributed by investors (including both shareholders and bondholders).

Mathematically,

- MV = Total Market Value of company Total Capital invested
  - = (MV of Share + MV of Debt ) Total Capital invested
  - = (Market Value Book Value) x No. of share Outstanding

Where,

MV of share = Market Capitalization= No. of Shares Outstanding x Share Price

MV of Debt = Book Value of Debt (as an estimate to the MV)

Total Capital Invested = Total Book Value of Equity and Debt

In the formula above, the market value of debt is deemed to be equivalent with the book value of debt since there is no active secondary debt market in India; therefore, it is hard to estimate the market value for the debt. A higher MVA indicates that a company has added more value than what has been contributed to it by shareholders, while a negative MVA indicates that the company has destroyed value.

#### **OBJECTIVES OF STUDY**

This study has the following specific objectives-

- 1. To analyze relationship of EVA and MVA with Reported Earnings.
- 2. To assess the worth of EVA and MVA as a predictor of the trends of reported earnings.
- 3. To evaluate the usefulness of EVA and MVA for investors and shareholders in order to make strategic decisions and investments.

However, the general objective of present study is to achieve a better understanding regarding the use of either Economic Value Added or Market Value Added as an effective explainer, interpreter and predictor of reported earnings in order to judge company's financial performance.

### HYPOTHESIS DEVELOPMENT

Following hypotheses are made to provide a reasonable argument for stating the explanatory and predicting power of EVA and MVA in relation in to reported earnings:

- H1: There is a relationship between EVA and reported earnings.
- H2: There is a relationship between MVA and reported earnings.
- H3: There is simultaneous relationship between EVA and MVA and reported earnings.

After the hypotheses are developed, two regression models are formulated. Based on these two models, the explanatory and predicting power of EVA and MVA in relation in to reported earnings will be assessed:

$$Y_t = a + b_1 (X_{1t}) + b_2 (X_{2t})$$
....(1)  
 $Y_t = a + b_1 (X_{1t-1}) + b_2 (X_{2t-1})$ ....(2)

Y represents the dependent variable (reported earnings), while  $X_1$  is the independent variable 1 (EVA),  $X_2$  is the independent variable 2 (MVA), a is a constant and b is the slope of the independent variable(s). First model could be used for evaluation purposes which explain the relationship between EVA and/or MVA with reported earnings in the same year. Second model could be used for prediction purposes which explain the relationship between EVA and/or MVA in previous year with reported earnings in the present year. The independent and dependent variables will be tested using regression models and correlation analysis. The regression will then be divided into simple (only one variable, EVA or MVA) and multiple regression (using two variables, EVA and MVA simultaneously).

#### DATA AND RESEARCH METHODOLOGY

COLLECTION OF DATA: The main object of present study is to achieve a better understanding regarding the use of either Economic Value Added or Market Value Added as an effective explainer, interpreter and predictor of reported earnings in order to judge company's financial performance. The data used in the research is secondary data, The present study is carried out in respect of 30 Indian firms listed in Bombay Stock Exchange for the period from 1<sup>st</sup> April 2008 to 31<sup>st</sup> March 2011. A purposive sampling design is made because there are several criteria that should be fulfilled, which are:

- 1. The company should have been listed in the Bombay Stock Exchange in the years covered under study period.
- 2. The company should have a complete set of financial statements and variables used in the study under study period.

ANALYSIS OF DATA: While analyzing the data used in this study Simple mathematical tool like ratio, percentage, average etc. and various statistical techniques and statistical tools like Pearson's simple correlation, multiple correlation, simple regression, multiple regression techniques and 'F' test etc. have also been applied at appropriate places.

### **FINDINGS AND DISCUSSION**

### HYPOTHESIS 1: THERE IS A RELATIONSHIP BETWEEN EVA AND REPORTED EARNINGS

This hypothesis will be analyzed using regression and correlation analysis between EVA and Reported Earnings. Two models to be used in the analysis:

Reported Earnings  $_{t}$  = a + b (EVA  $_{t}$ ) ......(a) Reported Earnings  $_{t}$  = a + b (EVA  $_{t-1}$ ).....(b)

The Pearson correlation for model 1-a is strong and positive between EVA and Reported Earnings in the same year (0.545); while 1-b is weak positive between EVA in previous year and Reported Earnings in present year (0.327).

The analysis of regression model 1-a, and 1-b show R Square of 0.297 and 0.107 respectively. Model 1-a has the highest R Square i.e., 0.297 which means 29.7% of variability in Reported Earnings can be explained by the EVA in the same year. Meanwhile, model 1-b has the R Square of 0.107 which means 10.7% of variability in Reported Earnings in present year can be explained by EVA in the previous year..

#### HYPOTHESIS 2: THERE IS A RELATIONSHIP BETWEEN MVA AND REPORTED EARNINGS

The hypothesis two is related to the relationship between MVA and Reported Earnings. Two models to be used in the regression analysis:

Reported Earnings  $_{t}$  = a + b (MVA  $_{t}$ ) ......(a) Reported Earnings  $_{t}$  = a + b (MVA  $_{t-1}$ ).....(b)

The Pearson correlation for model 2-a is strong positive correlation between MVA and Reported Earnings in the same year (0.828); model 2-b has strong positive correlation between MVA in previous year and Reported Earnings in present year (0.792);

The analysis of regression model 2-a and 2-b show R Square of 0.685 and 0.627 respectively.

Model 2-a has the highest R Square i.e., 0.685 which means 68.5% of variability in Reported Earnings can be explained by the MVA in the same year.

Meanwhile, model 1-b has the R Square of 0.627 which means 62.7% of variability in Reported Earnings in present year can be explained by MVA in the previous year.

#### HYPOTHESIS 3: THERE IS A SIMULTANEOUS RELATIONSHIP BETWEEN EVA AND MVA AND REPORTED EARNINGS

The hypothesis three is related to the relationships between EVA and MVA with Reported

Earnings. Two models to be used in the multiple regression analysis:

Reported Earnings  $t = a + b_1 (EVA_t) + b_2 (MVA_t) \dots (a)$ 

Reported Earnings  $_t$  = a +  $b_1$  (EVA  $_{t-1}$ ) +  $b_2$  (MVA  $_{t-1}$ ) ...... (b)

The Pearson correlation for model 3-a for EVA and MVA with Reported Earnings in the same year is 0.523, while correlation between EVA and Reported Earnings, and MVA and Reported Earnings in the same year are 0.545 (model 1-a) and 0.828 (model 2-a) respectively. Model 3-b has moderate positive correlation between EVA and MVA in previous year with Reported Earnings in the same year is (0.392), while correlation between EVA in previous year and MVA in previous year with Reported Earnings in present year are 0.327( model 1-b) and 0.792 (model 2-b) respectively;

Model 3-a and 3-b have R Square of 0.274 and 0.154 respectively. Model 3-a has the R Square of 0.274 which means that 27.4% of variability of Reported Earnings can be explained by the EVA and MVA simultaneously in the same period. Model 3-b has the R Square of 0.154 which means 15.4% of variability of Reported Earnings in present year can be explained by EVA and MVA in the previous year simultaneously.

#### **CONCLUDING REMARKS**

Depending upon the calculations and statistical analyses, there are some conclusions which should be highlighted:

- 1. The correlation between EVA and Reported Earnings in the same year is 0.545 which indicate a moderately high positive association. While the correlation between MVA and Reported Earnings in the same year is 0.828 which indicate a very strong positive correlation. The correlation between EVA and MVA simultaneously with Reported Earnings in the same year is 0.523. The regression analysis states that 29.70% of variability in Reported Earnings can be explained by EVA in the same year while 68.50% of variability in Reported Earnings can be explained by the MVA in the same year. 27.4% of variability of Reported Earnings can be explained by the EVA and MVA simultaneously in the same period. The above findings conclude that MVA is highly significant and extremely effective in explaining its relationship with Reported Earnings than that of EVA.
- 2. The correlation between EVA in previous year and Reported Earnings in the present year is 0.327 which indicate a moderately high positive association. While the correlation between MVA in previous year and Reported Earnings in the present year is 0.792 which indicate a very strong positive correlation. The correlation between EVA and MVA in previous year simultaneously with Reported Earnings in the present year is 0.392. The regression analysis states that 10.70% of variability in Reported Earnings in present year can be explained by EVA in previous year while 62.70% of variability in Reported Earnings in present year can be explained by the MVA in previous year . 15.40% of variability of Reported Earnings in present year can be explained by the EVA and MVA in previous year simultaneously .The above findings conclude that MVA is more effective and highly reliable in order to predict the trends of reported earnings in future.
- 3. In the study MVA showed a better association with reported earnings than that of EVA. The study also reflect that MVA is more effective explainer, interpreter and predictor of reported earnings than that of EVA. So, MVA information will be more useful for investors and shareholders in order to make strategic decisions and investments.

### LIMITATIONS AND RECOMMENDATIONS

The limitations of this study are relatively simple calculations of EVA and not all of the Indian listed companies are used as the sample. MVA and EVA had used data for smaller period whereas there is scope for future research on the concept by considering the data pertaining to longer durations in order to test the validity of the concept. Use of large sample and calculation of true EVA after considering the various adjustments may produce contradictory result. Positive reported earnings not always provide additional values. However, from this study it can be suggested that; Indian investors and shareholders should access the MVA related information along with the EVA related information in order to make strategic decision and investment decision.

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# APPENDICES CORRELATION

#### **CORRELATION MATRIX BETWEEN EVA, MVA AND REPORTED EARNINGS**

Independent variables	Dependent Variable			
	Reported Earnings t	Reported Earnings t	Reported Earnings t	
EVA <sub>t</sub>	0.545	-		
EVA t-1	-	0.327		
MVA t	0.828	-		
MVA t-1	-	0.792		
EVA t & MVA t			0.523	
EVA t-1 & MVA t-1			0.392	

#### **REGRESSION ANALYSIS**

1. Reported Earnings =  $\alpha + \beta$  (EVA)

	α	β	F-stat	R Square
Model A	1,148,522	0.479	68.264	29.70%
Model B	1,808,211	0.326	25.815	10.70%

2. Reported Earnings = α + β (MVA)

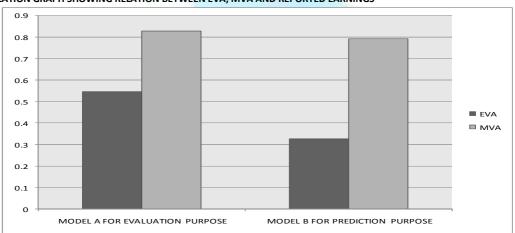
	α	β	F-stat	R Square
Model A	2,16,118	0.073	228.26	68.50%
Model B	3.02.598	0.084	184.81	62.70%

3. Reported Earnings =  $\alpha + \beta_1$  (EVA) +  $\beta_2$  (MVA)

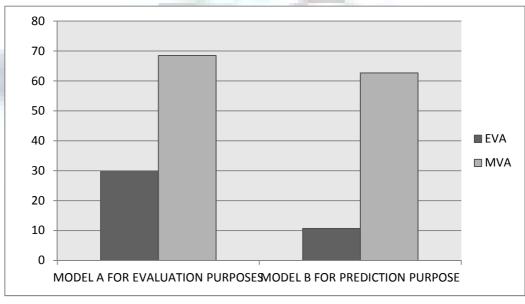
	α	β – avg.	F-stat	R Square
Model A	2,54,654	0.069	53.91	27.40%
Model B	3,17,328	0.089	28.74	15.40%

#### **GRAPHICAL REPRESENTATION**

1. MULTIPLE CORRELATION GRAPH SHOWING RELATION BETWEEN EVA, MVA AND REPORTED EARNINGS



#### 2. VARIABILITY OF REPORTED EARNINGS EXPLAINED BY EVA AND MVA PRESENTED THROUG REGRESSION GRAPH



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