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Relationship Between EVA And ROI And MVA (A Case Study Of Ten Manufacturing Industries In India)

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ABSTRACT

EVA is a hottest financial idea that is getting hotter day by day. Research has proved that there is a strong association between EVA and MVA. The present study is a attempt to add on to the research already done on the topic. In this research paper, EVA's association with another parameter ROI has also been checked and it has also been proved that there is strong association of EVA and ROI. This research paper is original work of mine and has not been presented and published anywhere else.

Keywords : EVA, ROI, MVA, Correlation, Regression, t-Test

Economic Value Added

EVA is a registered trademark developed by Stern Stewart & Co. Economic Value Added or EVA is an estimate of true economic profit which is made after making adjustments to GAAP accounting, including deduction of the opportunity cost of equity capital. By taking all capital costs into account, including the cost of equity, EVA shows the quantum of financial wealth a business has created or destroyed in a reporting period. In other words, EVA is profit in the way that shareholders define it. If the shareholders expect, say, a 10% return on their investment, they earn money only to the extent that their share of the NOPAT exceeds 10% of equity capital. The idea behind EVA is that shareholder must earn a return that compensates the risks taken by him.

EVA can be calculated as follows:

$$EVA = NOPAT - WACC \times CAPITAL EMPLOYED$$

Where

NOPAT refers to net operating profits after taxes. NOPAT is equal to earnings before interest and tax (EBIT) minus adjusted taxes (AT).

EBIT refers to the earnings before interest and tax.

Market Value Added

Market Value Added (MVA) is the difference between the current market value of a firm and the capital contributed by investors. If MVA is positive, the firm has added value. If it is negative, the firm has destroyed value. The amount of value added needs to be greater than the firm's investors could have achieved investing in the market portfolio, adjusted for the leverage (beta coefficient) of the firm relative to the market.

Market Value Added can be calculated as follows:

$$\text{Market Value Added (MVA)} = \text{Market Value} - \text{Invested Capital.}$$

The higher the Market Value Added (MVA) is, the better it is. A high MVA indicates the company has created substantial wealth for the shareholders. MVA is equivalent to the present value of all future expected EVAs. Negative MVA means that the value of the actions and investments of management is less than the value of the capital contributed to the company by the capital markets. This means that wealth or value has been destroyed. The aim of a firm should be to maximize MVA. The aim should not be to maximize the value of the firm, since this can be easily accomplished by investing ever-increasing amounts of capital.

Return on Investment

The return on investment (ROI) percentage shows how profitable a company's assets are in generating revenue.

ROI can be calculated as follows:

$$ROI = \frac{\text{Net income} + \text{Interest Expense} - \text{Interest Tax Savings}}{\text{Total investment}}$$

ROI is a useful ratio for comparing competing companies in the same industry. The ratio will vary widely across different industries. Return on investment gives an indication of the capital intensity of the company, which will depend on the industry; companies that require large initial investments will generally have lower return on investment. Return on investment is an indicator of how profitable a company is before leverage, and is compared with companies in the same industry.

About the study

In the present study ten leading manufacturing industries are taken and from each industry five companies are taken to get industry average. Here, the names of 10 manufacturing industries taken for the present research purpose have been given:

1. Automobile Industry
2. Cement Industry
3. Fertilizers Industry
4. Food Industry
5. Metal Industry
6. Petrochemicals Industry
7. Pharmaceuticals Industry
8. Steel Industry
9. Textile Industry
10. Paper Industry

Hypothesis: There is association between EVA and ROI and MVA

Null Hypothesis Ho: There is no association between EVA and ROI and MVA

Alternative Hypothesis Ha There is significant association between EVA and ROI and MVA

Limitations of Study

1. Due to non availability of data regarding Beta Factor, we have not used CAPM model in the study in calculation of EVA.
2. We have limited the research for the period from 2003-04 to 2007-08 due to non availability of annual reports beyond 2003-04 of most of the companies.

The Analysis

To check whether there is any relationship between the behaviour of EVA and ROI and MVA measures, rank correlation has been applied as given by Charles Edward Spearman.

$$r = 1 - 6 \frac{\sum D^2}{N(N^2-1)}$$

The value of r varies between + 1. If r is + 1, it shows that there is perfect agreement in order of ranks and ranks are in same direction. If r is -1, it shows that there is complete disagreement in order of ranks and ranks are in opposite direction.

Table -1 Correlation of EVA and ROI and MVA

Industries	EVA/ROI	EVA/MVA
Steel Industry	1.00	0.89
Petrochemical Industry	0.77	0.89
Textiles Industry	0.09	0.89
Pharmaceuticals Industry	0.49	0.94
Cement Industry	0.94	0.71
Automobiles Industry	0.43	-0.14
Fertilizers Industry	0.31	-0.66
Food Industry	0.03	0.49
Metals Industry	0.94	0.89
Paper Industry	-0.26	0.89
Grand Average	0.83	0.60

On an average there has been the strongest correlation between EVA and ROI at 0.83. Most of the industries have strong and positive correlation between EVA and ROI except Paper Industry.

There has been strong correlation between EVA and MVA. Most of the industries under study have the positive and strong correlation between MVA and EVA except Automobiles and Fertilizers Industry.

Association between ROI and MVA with Economic Value Added

To check whether there is association between EVA and ROI and MVA, simple regression analysis has been applied. Further t-test has also been applied. Slope of the regression line and intercept has been calculated. Standard error has also been calculated.

Regression equation

$$Y = a + bX$$

Constants i.e Slope and intercept has been calculated as

$$\sum Y = Na + b \sum X$$

$$\sum XY = a \sum X + b \sum X^2$$

Table - 2: Regression of EVA and Traditional Performance Measures

Parameters	Intercept (a)	Slope of Regression Line (b)	r ²	Standard Error	Value of t	Accept or Reject H ₀
EVA/ROI	17.78	0.08	0.82	-0.82	2.011	Difference is insignificant
EVA/MVA	108.60	6.84	0.52	19.27	2.081	Difference is insignificant

As presented above, Return on Investment (ROI) displays the highest association with Economic Value Added, with R2 of 0.82 (82%). While Market Value Added (MVA) displays R2 of 0.52 (52%).

The research studies conducted by Uyemura et al. (1996), Taub (2003), Millunovich and Tseui (1996) found that MVA is highly correlated with EVA. There is strong correlation between EVA and MVA as displayed in the table 5.1.3 at 0.52. The study supports the earlier research findings.

t-Test

$$t = r \sqrt{(n-2) / (1-r^2)}$$

r is the simple correlation between the variables and degree of freedom is (n-2). Level of significance is 5%.

The tabulated value of t at 5% level of significance and degree of freedom 4 is 2.132.

There is very small difference between the table value and the calculated value in case of EVA and MVA and EVA and ROI. So, it can be concluded that MVA and ROI are associated with EVA.

Conclusion

There has been strong correlation between EVA and ROI and MVA. When the association of EVA and MVA has been checked, it has been found that there is association between EVA and MVA. When we applied t-test, there has been very small difference between the tabulated value and the calculated value of t. Earlier the studies of various researchers have propounded that there is strong association between EVA and MVA, the present study also presents the same results. There has been strong association between EVA and ROI also as presented in the study.

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