EFFICACY OF ECONOMIC MEASURES OF PERFORMANCE IN DETERMINING THE MARKET VALUE ADDED (MVA) OF SHARES

CMA. Dr. P. Srikanth
Assistant Professor
ICFAI Business School (IBS)
Hyderabad

Management accounting is witnessing landmark changes in the recent past. One of the areas of management accounting which is always in the spotlight is 'performance measurement'. The conventional accounting measures of performance are losing their importance due to their inherent limitations. They do not take into account the opportunity cost of capital contributors' in deriving the profitability measures. The everlasting research in this area has been producing well-reflected measures of performance whose efficacy is tested by empirical research by the academia and professional bodies of accounting. One type of such innovative and well-reasoned measures of performance are economic measures of performance. Economic Measures of Performance are gaining their importance by virtue of their robustness to creative accounting. Economic measures of financial performance overcome the inherent limitation of conventional accounting measures by taking into account the opportunity cost of capital while calculating the profits of a company. Despite having many advantages in using economic measures of performance, they are not used widely. It is due to the fact that their estimation is not easy and requires many assumptions.

Economic Measures of Financial Performance

Two economic measures of performance which can used to measure the financial performance of a company are 'Residual ROCE' and Economic Value Added(EVA)'.

The concept of EVA is analogous to the concept of 'residual income' in economics. The concept of EVA stems from the economic concept of 'residual income' which takes into account the opportunity cost of owner's capital. EVA measures the residual income of a firm more precisely and practically. Besides, while estimating EVA, NOPAT is considered as a proxy of accounting profit. NOPAT measures operating performance of a firm more accurately by excluding the tax saving in computation of net operating profit, as tax saving is not the results of operating performance of the company rather it signifies financial performance of a company.

The 'Residual ROCE' is the excess of ROCE over the 'cost of capital'. The fundamental difference between EVA and 'Residual ROCE' is EVA takes into account operating profits while 'Residual ROCE' considers net profit. Besides, 'Residual ROCE' is expressed in percentage terms while EVA is in absolute terms.

Importance of the Study

Economic measures of performance are theoretically assumed to be superior measures of performance. Establishing the superiority of the economic measures of performance can be done only through rigorous empirical research backed by scientific methodology of research. Moreover, there is a need for developing more number of economic measures and testing their relative importance in the performance measurement, because, no single measure can exhaustively embrace all the ideal features of performance measurement tool. Hence, the present study considers economic measures which are based on both operating profit and net profit. The present study focuses on the analysis of importance of the economic measures of performance and how they are reflected through market value addition for the share.

Findings of the study provide useful insights into the informational efficiency of the market in terms of reflecting the economic measures of profit on the market value of shares.

Literature Review

Sakthivel N. (2011) found that the companies with high level of EVA are very highly valued and differ from valuation of companies with low and moderate EVA groups. Based on this finding, it can be concluded that there was significant association between MVA and EVA for companies in pharmaceutical industry. It was observed that there was significant difference in mean value creation across low, moderate and high total productivity

for pharmaceutical companies. Regression analysis reveals that total productivity does not have explanatory power on value creation in short-term, but it has some influence on value creation in the long-run in respect of pharmaceutical companies. **Madhavi Eswara at. el., (2015)** examined whether the select seven Indian companies from FMCG sector listed on NSE have created shareholder value in terms of EVA and MVA during the five years from 2010 to 2014. MVA is considered as a proxy for determining the market value of the firms. The study supports Stern Stewart's claim that EVA is a superior predictor of market value of the firms compared to EPS and it has stronger relationship and relevance to capital markets than other traditional measures. **Merugu Venugopal et. al., (2016)** examined the shareholder's value creation in Indian pharmaceutical companies by employing EVA during the study period 2007-15. The study reveals that 39 firms out of 77 were wealth creators. The study concludes that the companies with positive EVA will be able to attract investors in future. **Anna Kijewska (2016)** explained the impact of various factors on the change in EVA. The assumption was that every company is in a different financial condition, so the impact of various factors on the EVA change is different. In case of sample companies, difference in influence of various factors has been observed for three consecutive periods, the study concludes that for each company and for each year, managers should consider the factors that influence the EVA change.

Research Gap

The existing literature on this of area of research has documented the empirical research covering the analysis of relationship between market value of a share and EVA vis-à-vis conventional financial performance measurement metrics. One insightful research gaps has been identified from the literature review viz., the existing studies have considered EVA only as a measure of performance. In the present study, apart from EVA, 'residual ROCE' is also considered as an economic measure of performance and the importance of the two measures is analyzed.

Objective of the Study

The objective of the study is to analyze the informational efficiency of the stock market in terms of reflecting economic measures of performance on the Market Value Added (MVA) of shares.

Hypothesis of the Study

Null Hypothesis: Economic measures of performance do not have significant information content about the Market Value Added (MVA) of the shares.

Alternative Hypothesis: Economic measures of performance have significant information content about the Market Value Added (MVA) of the shares.

Period of the Study

For the purpose of the present study, cross-sectional data of select companies for the year ending 31st march, 2017 was considered.

Data and Methodology of the Study

Data Sources: The data relating to the required variables has been collected from CMIE Prowess Database.

Sample Design of the Study

The CMIE Prowess database has provided the data relating to the required variables for the year ending 31st march, 2017 for only 408 companies. Out of 408 companies, 75 companies with positive EVA were selected randomly. After selecting the 75 companies, some companies have been eliminated due to presence of outliers in the required variables. Finally, 59 companies are leftover for the analysis.

Estimation of Market Measure and Economic Measures of Performance

- **Market Value Added(MVA):** Market Value Added is computed as the excess of market value of capital over the book value of Capital. It is indicates the performance of the company from shareholders viewpoint. Higher value of MVA implies effective management and strong operational capabilities of the company. The following equation outlines the computations of MVA.

  MAV=(Market Capitalization+Debt)-(Book Value of Equity+Debt)

- **Economic Value Added (EVA):** EVA is computed as the excess of Net Operating Profit After Tax(NOPAT) over the cost of capital (in amount) of the company. The following equation outlines the computations of EVA.

  EVA=NOPAT-[COC*CE]

  In the above equation, COC refers to percentage of cost of capital and CE refers to capital employed.

- **Net Operating Profit after Tax (NOPAT):** Net Operating Profit after Tax is computed by multiplying the Earnings before Interest and Tax (EBIT) with 1 minus tax rate. NOPAT is a more accurate measure of operational efficiency of a company, as it does not consider tax savings which arise from interest expenses. Because, tax saving arising from interest expenses do not indicate the operational efficiency of the company.

Performance measurement is one of the core areas of management accounting and it is also the main thrust of research in Management Accounting. The invention of modern tools and techniques in performance measurement is the results of consistent research efforts made by the eminent management accounting professionals and academia. The conventional accounting metrics of financial performance do not take into account the opportunity cost of capital contributors. Hence, they may not indicate the economic substance of the financial performance of a company in a well-reflected manner. Economic measures of financial performance overcome this limitation by taking into account the opportunity cost of capital while calculating the profits of a company. In the present study, two economic measures of performance are employed to predict the 'Market Value Added (MVA)' of the shares. They are 'Residual ROCE' and 'Economic Value Added(EVA)'. The fundamental difference between EVA and 'Residual ROCE' is EVA takes into operating profits while 'Residual ROCE' considers net profit. The present study unveils an intriguing finding that 'Residual ROCE' was effectively predicting the MVA of the shares compared to EVA. The superior predictability of the 'Residual ROCE' may be attributable to the fact that investor assign more importance to bottom line of the income statement i.e., net profit, rather than to the operating profit.

Symbolically, NOPAT can be presented as follows.

$$NOPAT=EBIT*(1-t)$$

In the above equation, 't' refers to tax rate.

- **Cost of Capital (COC):** In order to calculate the cost of capital, weights have been assigned based on the market value of equity and debt. The cost of debt is computed by dividing the interest expenses by current year outstanding debt and cost of equity is derived from CAPM. Symbolically, %COC can be presented as follows.

$$\%COC=[Kd*Wd]+[Ke*We]$$

In the above equation, Kd is cost of debt, Wd is weight assigned to debt, Ke is cost of equity, We is weight assigned to equity. Weights are assigned based on market value of debt and equity.

- **Cost of Equity:** Cost of Equity has been computed by employing Capital Asset Pricing Model (CAPM). Under this model, cost of equity is equal to the sum of 'risk free rate of interest' and 'market risk premium' multiplied by the beta of the concerned security. As the market risk premium and risk free rate of return are common for all the securities in the market, it is the beta of the concerned security which decides the cost of equity. Higher the value of beta, greater the cost of equity and vice versa. CAPM can be expressed in equation form as follows

$$K_e=R_f+\beta(R_m-R_f)$$

In the above Equation, K_e is cost of equity, R_f is risk free rate of return, β is the beta value of the concerned security, R_m is market return. The weighted average call money rate is considered as proxy for risk free rate of return.

Functional Relationship between Market Value Added(MVA) and Economic Measures of Performance

The functional relationship between MVA and economic measures of performance has been analyzed in two different approaches. The MVA and EVA (Economic Value Added) are considered in their relative form in the regression analysis by dividing them with book value of the capital. In other words, size factor is controlled while analyzing the data.

First Approach: In the first approach, the accounting measure of profitability i.e., ROCE is adjusted with the overall cost of capital of the company and it is called 'residual ROCE'. It indicates the excess return earned on capital employed over the cost of capital. Higher the

'residual ROCE', more the profitability of the company in economic terms, as it is taking into account the opportunity cost of capital in computation of profitability. Symbolically, 'residual ROCE' can be expressed as follows.

$$\text{Residual ROCE} = \text{ROCE} - \text{COC}$$

The following regression model is constructed to test the functional relationship between 'MVA/Capital Ratio' and 'residual ROCE'.

$$\text{MVA/Capital}_i = \alpha_o + \beta_1(\text{ROCE-COC0})_i + \varepsilon_i \quad \text{.....(1)}$$

In the above equation, α_o is constant; β_1 is coefficient of 'Residual ROCE' of company 'i'; and ε_i is error term.

Null Hypothesis: The 'Residual ROCE' has no impact on MVA/Capital Ratio

Alternative Hypothesis: The 'Residual ROCE' has its impact on MVA/Capital Ratio

Second Approach: In the second approach, the impact of EVA on MVA has been analyzed by applying OLS regression. In regression model, both the variables i.e., MVA and EVA are taken in their relative form by dividing them with capital. The following regression model outlines the functional relationship between the two variables.

$$\text{MVA/Capital}_i = \alpha_o + \beta_1 EVA/Capital + \varepsilon_i \quad \text{.....(2)}$$

In the above equation, α_o is constant; β_1 is the coefficient of *EVA/Capital* ratio of company 'i'; and ε_i is error term.

Scope of the Study

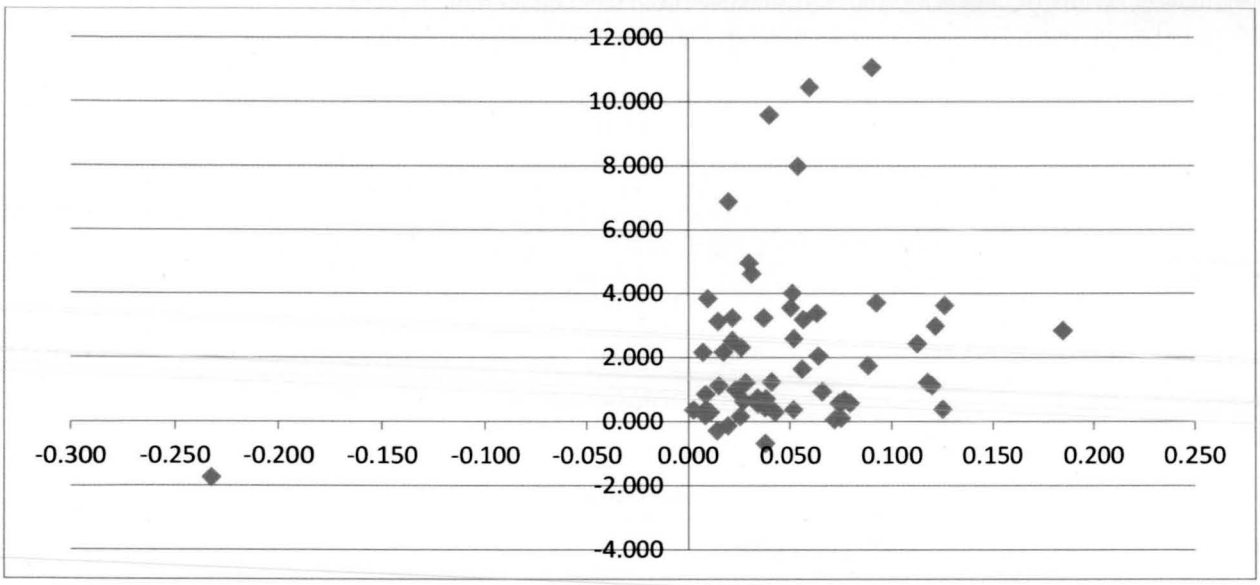
The present study centers around analysis of the informational efficiency of the market in terms of reflecting the economic measures of financial performance on the security prices. The sampling is confined to only positive EVA companies and cross-sectional data is only used but not the time series data and panel data.

Limitations of the Study

From the universe of the companies with positive EVA, 75 companies have been selected randomly. But, due to the presence of outliers in the values of the variables, 16 companies have been excluded. Exclusion of outliers will produce more precise statistical results, but the validity of the results may be undermined due to the loss of information content belonging to the outlier companies. However, as the sample size is still sufficient after excluding outlier values, the results of the study can be effectively validated to the companies which are not having abnormal values of the EVA, MVA, ROCE and 'cost of capital'. Moreover, if panel data is used, the results of analysis may be different.

Results of the Analysis

Chart 1: Scatter Diagram of MVA/ Capital Ratio and EVA/Capital Ratio of Select Companies



The chart 1 shows the pattern of relationship between MVA/Capital Ratio and EVA/Capital Ratio of select companies.

The X axis shows EVA/Capital Ratio and Y axis shows MVA/Capital Ratio. The negative ratio for only one company was due to having negative capital(i.e, due to accumulated losses). The scatter diagram manifests the positive association between EVA and MVA. There are a few extreme values in the group for which MVA/Capital Ratio was remarkably high with relatively smaller EVA/ capital ratio. It indicates strong investors expectations about the better future prospects of the company and/or it may be attributed to the presence of intangible asset which were not accounted for by the conventional accounting system. The MVA/ Capital ratio ranges between 0 to 4 for most of the companies while EVA/ capital ratio ranges between 0 to 0.125.

Chart 2: Cost of Capital (COC) and Return on Capital Employed (ROCE) of the Select Companies

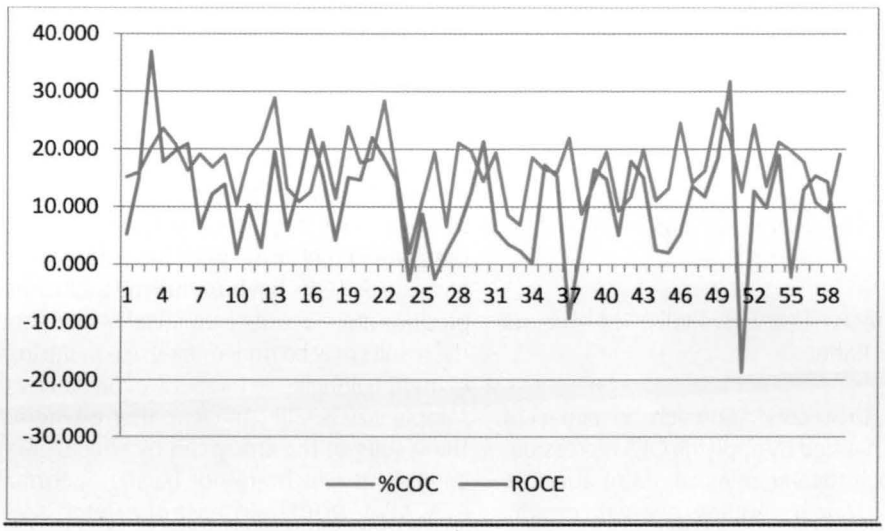


Chart 2 shows the COC and ROCE of the select companies. The difference between COC and ROCE is not similar for all the select companies. For some companies, the difference is larger and for some companies the difference is smaller. The companies like Aksharchem (India) Ltd., Patel Engineering Ltd. ITD,. Zuari Agro Chemicals Ltd. etc., experienced larger deviations between COC and ROCE and the companies liked Balrampur Chini Mills Ltd. Glaxosmithkline Pharmaceuticals Ltd. and Khaitan (India) Ltd. experienced smaller deviation between COC and ROCE.

Table 1: Regression Analysis Model – I [D.V.=MVA/Capital]

Variable	Coefficient	Std. Error	t-Statistic	Prob.
(ROCE-COC)	0.109634	0.034537	3.174362	0.0024
Constant	2.851920	0.376923	7.566325	0.0000
Model Summary				
R-squared	0.150225	F-statistic		10.07658
Adjusted R-squared	0.135317	Prob(F-statistic)		0.002422
S.E. of regression	2.430105			
Model Diagnosis				
Heteroscedasticity Test: Breusch-Pagan-Godfrey				
F-statistic	6.599482	Prob. F(5,53)		0.0128
Obs*R-squared	6.122211	Prob. Chi-Square(5)		0.0133

Scaled explained SS	9.917737	Prob. Chi-Square(5)	0.0016
Ramsey RESET Test			
	Value	**df**	**Probability**
t-statistic	1.453916	56	0.1516
F-statistic	2.113873	(1, 56)	0.1516
Likelihood ratio	2.186111	1	0.1393

Interpretation of Regression Results: Table 1 presents the results of regression analysis done for model-I as discussed in the methodology of the study. The results of the analysis reveal that the 'Residual ROCE' has significant positive impact on MVA/Capital ratio. So, it can be inferred that shares of the companies with positive 'residual ROCE' are traded at relatively more premium in the market. R-squared value discloses that 15% of the cross-sectional variations in MVA/Capital ratio have been explained by the contemporaneous changes in 'Residual ROCE' while F-statistic discloses significant predictability of the model.

Interpretation of Model Diagnosis Results: The individual companies in the cross-sectional sample of the data may be divergent in terms of their size and other criteria. It may cause non-constant variance of the error term. It gives rise to heteroscedasticity in the residuals derived from the regression analysis. If heteroscedasticity is present in residuals of the regression, the estimators of the regression do not produce minimum variance. Hence, in order to ensure that residuals derived from the regression are not heteroscedastic, 'Breusch-Pagan-Godfrey' test has been applied. The test had a null hypothesis of "residuals are homoscedastic". The results of the test ensure that the residuals are homoscedastic (p>0.01)

When regression model is constructed, the model should be an ideally fit model. The under-fitting or over-fitting of the model will not produce reliable results. One widely used test to ensure the ideal fit of the model is Ramsey's RESET Test. It is based on the premise that if the predicted values of the dependent variable are introduced into the regression model in its squared form, it should not resulted in increased R-squared and/or increase in significance of F-statistic. If it is so, then we can infer that the model is free from specification error. The results of Ramsey RESET test ensure that the model is not having specification error (p>010).

Table 2: Regression Analysis Model – II [D.V.=MVA/Capital]

Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
EVA/Capital	11.03220	3.938893	2.800837	0.0069
Constant	1.692883	0.329337	5.140269	0.0000
Model Summary				
R-squared	0.049690	F-statistic		2.980439
Adjusted R-squared	0.033018	Prob(Wald F-statistic)		0.006948
S.E. of regression	2.569837			
Heteroscedasticity Test: Breusch-Pagan-Godfrey				
F-statistic	0.387552	Prob. F(5,53)		0.5361
Obs*R-squared	0.398442	Prob. Chi-Square(5)		0.5279
Scaled explained SS	0.941256	Prob. Chi-Square(5)		0.3320

Ramsey RESET Test			
	Value	**df**	**Probability**
t-statistic	0.673464	56	0.5034
F-statistic	0.453554	(1, 56)	0.5034
Likelihood ratio	0.475927	1	0.4903

Interpretation of Regression Results: In the regression model, in order to derive minimum variance by the estimators of the regression, Huber-White covariance method is used for estimating covariance of the coefficients. The results of the regression analysis reveal that EVA/Capital Ratio has significant positive impact on MVA/Capital Ratio indicating the informational efficiency of the market in terms of reflecting the economic measures of profit on the share prices. However, the R-squared value is very low implying the explanatory power of the model only upto 5 percent.

Interpretation of Model Diagnosis Results: Though, the value of R-squared is very low, heteroscedasticity test results disclose that the residuals are free from heteroscedasticity ensuring that estimators of the model will produce minimum variance. Moreover, Ramsey RESET Test confirms that there is no specification error in the model.

Final Findings and Conclusions

Economic measures of financial performance are assumed to be superior measures of financial performance, because they reflect the economic substance of the activities of the business. On the flip side, estimating the economic measures is complicated and involves many assumptions and subjective judgments. Against this backdrop, the present study aims to analyze the informational efficiency of the stock market in terms of reflecting the economic measures of financial performance on the share prices. Apart from EVA, 'residual ROCE' is also considered as an economic measure of performance.

The present study unveils an intriguing finding that 'residual ROCE' can effectively predict the MVA of the shares compared to EVA, as the adjusted R-squared value of the regression is comparatively more for the regression with 'residual ROCE' as a predictor. It may be due to the fact that 'residual ROCE' is a more intuitive and simple economic measure compared to EVA. The superior predictability of the 'residual ROCE' may also be attributed to the fact that investors assign more importance to bottom line of the income statement i.e., Net profit, but not the operating profits. As EVA is derived as excess of net operating profit over cost of capital, it does not take into account the other incomes. MA

Scope for Further Research

The results of the present study are posing a challenge to the conventional EVA as a measure of economic profits and hence, more empirical research has to be done in this direction to test the efficacy of EVA vis-à-vis other modern economic measures of profit. Sector-specific study may also be helpful in drawing more insightful conclusions.

References

1. *Anna Kijewska(2016) "Causal analysis of determinants influencing the Economic Value Added (EVA) – a case of Polish entity", Journal of Economics and Management, Vol. 26 (4) · 2016.*

2. *Bhargav Pandya(2017), "Measurement and Investigation of Shareholder Value Creation: Empirical Evidence From India", Pandya, Apeejay-Journal of Management Sciences and Technology, 5 (1), October- 2017*

3. *Eswara, Madhavi and Venkat, Prasad Satya(2015), An Empirical Study on Economic Value-Added and Market Value-Added of Selected Indian FMCG Companies (November 17, 2015). The IUP Journal of Accounting Research & Audit Practices, Vol. XIV, No. 3, July 2015, pp. 49-65.*

4. *Merugu Venugopal and Dr. M Ravindar Reddy (2016) "Measuring Shareholders' Value in Indian Pharmaceutical Companies': Economic Value Added (EVA) Approach" International Journal of Advanced Scientific Research and Management, Vol. 1 Issue 10, Oct 2016, pp16-22.*

5. *Sakthivel N. (2011) "Value Creation In Indian Pharmaceutical Industry: A Regression Analysis", Researchersworld, Vol.- II, Issue -1, Jan. 2011.*

33144potharla@icmaim.in