VALUE BASED PERFORMANCE INDICATORS VERSUS ACCOUNTING EARNINGS BASED PERFORMANCE INDICATORS – A CASE STUDY WITH REFERENCE TO ONGC

This paper attempts to examine the relationship between share price and market value added, economic value added and cash value added vis-à-vis accounting earning based measures like Return on Investment, Return of Net Worth and Earnings per share

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THE adaption of liberalization and privatization in 1991 changed the situation that the government started allowing the Indian gas and petroleum industries to go into private hands and entered into government and private joint ventures. The development in the Indian capital market, both in depth and breadth along with the increased awareness among the shareholders, has increased the pressure on the companies to consistently perform better. Investors, world over, are currently demanding more shareholder value than just high returns. Maximizing shareholders value has always been the ultimate aim of every company. Investors are very keen in assessing the corporate financial performance that correlate with shareholders wealth particularly the market price of a share. Traditional performance measures like return on investment, earnings per share, etc., have been used as the most important measure of shareholder value creation. However, more recently there has been a growing awareness that these conventional accounting measures are not reliably linked to increasing value of the company's shares. This occurs because earnings do not reflect changes in risk and inflation, nor do they take account of the cost of additional capital invested to finance growth.

There are number of other reasons also behind failure of accounting based earnings to measure changes in the economic value of the business, which are:

• Alternative accounting methods may be employed.
• Dividend policy is not considered.
• The time value of money is ignored.

The value of companies' shares will only increase if management can earn a rate of return on new investments, which is greater than the rate investors expect to earn by investing in alternative, equally risky companies.

Since the concept of "maximizing shareholder wealth" was developed in the 1970's, more and more enlightened managers are focusing on strategies, which maximize economic returns for

shareholders, as measured by dividends plus the increase in the company's share price.

This insufficiency and somewhat irrelevancy of accounting based performance indicators have given rise to the need of alternative performance indicators. The value based performance indicators is an answer to the limitations of traditional accounting based performance indicators. In this paper, In the recent years, value based measures which measure performances in terms of change in value have received a lot of attention. There are several value-based measures such as Cash Flow Return on Investment (CFROI), Economic Value Added (EVA), Market Value Added (MVA) and Cash Value Added (CVA). This paper attempts to examine the relationship between share price and Market Value Added, Economic value added and cash value added vis-à-vis Accounting earning based measures like Return on Investment, Return of Net Worth and Earnings per share with particular reference to ONGC a BSE Sensex company.

Review of literature

Economic Value Analysis (EVA), developed by Stern Stewart & Co., New York and other challengers like Cash Value Added (CVA) developed by Ottoson and Weissenrieder (1996) and Cash Flow Return on Investment (CFROI) by Madden (1998) are number of Value Based Management Frameworks. A number of empirical research studies have been undertaken by researchers to explain the variations in shareholders' wealth through traditional performance measures as well as applying the newest evaluation metric, A brief overview of such studies and research papers is being presented below.

➔ **Biddle (1996)** tested assertions that Economic Value Added (EVA) is more highly associated with stock return and firm values than accrual earnings, and evaluated which components of EVA, if any, contribute to these associations. The study has used a sample of 6174 firm–years representing both adopters and non–adopters of EVA over the period 1984 to 1993. The correlation and regression test revealed that earnings were more highly associated with return and firm values than EVA, RI, or cash flow from operations.

➔ **Lehn and Makhija (1996)** examined the effectiveness of EVA and Market Value Added (MVA) as a measure of performance and as a signal of strategic change. The study has used the data of 241 large US companies for the period 1987-1996 and analyzed through descriptive statistics and multiple correlation. The results show that EVA and MVA effectively measured the quality of strategic decisions and served as signals of strategic change. They were found to be significantly correlated with stock price performance and inversely related to turnover.

➔ **O'Byrne (1996)** tested the explanatory power of capitalized EVA, Net operating profit after tax, free cash flows relative to market value divided by invested capital. The study has made two adjustments to the original model of Stern and Stewart for the period started from 1985 to 1993. The author used nine years of data and the total sample included 9000 largest publicly traded companies. The results were analyzed with the help of descriptive statistics and regression model. The findings showed NOPAT and EVA have almost the same explanatory power. He concluded that the EVA has correlation with the market value and acts as a powerful tool for understanding expectations of the investor.

➔ **Grand (1996)** studied the relationship between MVA and EVA. The study selected 983 companies from the Stern Stewart Performance 1000 for the years 1993 and 1994 in US. It also examined the effects of the economy and EVA on MVA with the help of multiple correlations. The results show that EVA and GDP significantly affect MVA and there was a high level of correlation between MVA and EVA for companies having positive EVA. The author found that the corporate profits should be measured in relation to the amount of capital invested in order to generate a particular level of profitability. His empirical study brought out that EVA has a significant impact on MVA of a company.

➔ **Milunovich and Tsuei (1996)** evaluated EVA in computer industry and determined which variable has best correlation with stock price. They also investigated the correlation between frequently used financial measures (including EPS, ROE, EVA) and the MVA of companies in the US Computer Technology Industry (so-called 'server-vendors') for the period 1990 to 1995. The study included top 11 computer companies of the U.S. The results showed the variability in correlation of different performance measures with MVA in computer industry. They concluded that EVA has the best correlation with MVA and stock price and primary determinant of changes in MVA.

➔ **Chen and Dodd (1997)** reviewed that EVA is the most recent and exciting innovation in company performance measures. The study examined the EVA performance of 656 US companies and compared the information usefulness of EVA with accounting earnings and residual income through co-efficient of correlation. The results show that EVA was more powerful than traditional measures of accounting profit in explaining stock return. They also found that Economic Value Added was not only similar to Residual Income in concept, but also empirically comparable.

➔ According to **Bhattacharyya** and **Phani (2004)**, India has found supporters for EVA. It has already earned favor with journalist and leaders in corporate reporting. However most of them do not calculate EVA rigorously, rather they take casual approach in calculating and reporting EVA. The authors also commented on the process of determining EVA by Infosys.

➔ **Anand et al. (1999)** have studied the relationship

between the ranks given in KPMG-BS (1998) study and were of the view that EVA and MVA are better measures of business performance.

Objectives and hypothesis of the paper

- The central objective of the study is to determine the degree of association between market value of shares and value based measures vis-à-vis accounting earning based measures. More specifically, the major objectives of the study are:
  1. To identify the relationship between market value of shares and accounting earnings based measures
  2. To find out the relationship between accounting based measures and value-based measures
  3. To determine the degree of association between market value of shares and value based performance measures.
- Based on the objectives the hypothesis are
  1. Ho_1: no relationship between market value of shares and accounting earnings based measures
  2. Ho_2: no relationship between accounting based measures and value based measures
  3. Ho_3: no relationship between market value of shares and value based performance measures.

Data and methodology

The data for the period from 2000-01 to 2011-12 used in this study have been collected from the secondary sources i.e. published annual report of the selected company, various reputed journal, e-journal from UGC-Influent centre, various reputed books of finance, etc. prowess data base package has also been used for procuring data. The rationality behind selection of the sample period lies in the fact that there has been a radical transformation in the corporate financial reporting and disclosure practices resulting from promulgation of revised clause 49 on corporate governance. Besides, there has been an overwhelming change in the requirement of corporate disclosures by the enactment of Company's Amendment Act, 2000 and Company's Amendment Act, 2002 ; issue of about 17 new accounting standards by ICAI on or after 1.4.2000 and ICAI's all-out effort to converge the Indian accounting standards with the International Accounting Standards particularly from 2002. The sample period also covers the last two planning period years of the, 10th plan period and the 11th plan period of Govt. of India. Moreover, the annual reports of the financial year 2012- 13 are the latest available annual reports at the time of conducting this study and hence, they are easy to obtain. The data obtained from annual reports and prowess databases would be suitably processed by applying relevant statistical tools and financial tools in order to reach the conclusion. The statistical tools applied here is the multiple correlation analysis and simple linear regression model and the result is tested using the Students 't' test at 1% and 5% level of significance.

Company's profile and performance measurement variables

a. Company's profile

Oil and Natural Gas Corporation Limited (ONGC) is an Indian multinational oil and gas company headquartered in Dehradun, India. It is one of the largest Asia-based oil and gas exploration and production companies, and produces around 77% of India's crude oil (equivalent to around 30% of the country's total demand) and around 81% of its natural gas. It is one of the largest publicly traded companies by market capitalization in India. ONGC has been ranked 357th in the Fortune Global 500 list of the world's biggest corporations for the year 2012. It is also among the Top 250 Global Energy Company by Platts. ONGC was founded on 14 August 1956 by the Indian state, which currently holds a 74.14% equity stake. It is involved in exploring for and exploiting hydrocarbons in 26 sedimentary basins of India, and owns and operates over 11,000 kilometers of pipelines in the country. Its international subsidiary ONGC Videsh currently has projects in 15 countries. The company is state owned and listed both in BSE and NSE.

b. Share price = average of opening price , closing price, high price and low price

c. Accounting earning – based performance measurement metric

Traditionally the methods of measurement of corporate performance are many. In this chapter, we will concentrate only five different earning- based performance measurement systems. They are classified as

(i) Profitability ratio based on Assets/ Investments;
- **Return on capital employed (ROCE)**

- $ROCE = \dfrac{\text{Net Profit After tax}}{\text{(Average Capital Employed)}} \times 100$

(ii) Profitability from the point of view of Owners /Shareholders;
- **Earning Per Shares (EPS)**

- $EPS = \dfrac{\text{Net Profit–Pref Dividend}}{\text{Number of outstanding Equity Shares}}$

(iii) Profitability ratio in the context of managerial performance;
- **EBDITA Margin**

$$\dfrac{\text{Earning before Interest,Taxes,Depreciation,and Amortisation}}{\text{Net Sales}}$$

d. Value–based performance measurement metric

There are several value-based measures such as Cash Flow Return on Investment (CFROI), Economic Value Added (EVA), Market Value Added (MVA) and Cash Value Added

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(CVA). This paper attempts to examine the relationship between share price and Market Value Added, Economic value added and cash value added

(i) Economic value added

Economic Value Added is a modified version of residual income or economic profit. The Economic Value Added (EVA) metric is a quantitative technique to evaluate a firm's financial performance. Any surplus generated from operating activities over and above the cost of capital is termed as Economic Value Added (EVA)

EVA = NOPAT − Capital Charge

NOPAT = PAT + Interest (1 − t)

Capital charge = cost of capital x capital employed

Cost of capital : k_d (proportion of debt) + k_e (proportion of equity)

Capital Employed: Capital employed is the total of net-worth and borrowings.

Interest and K_d: Since interest is not directly available form the prowess database, it has been calculated by dividing the interest as shown in the income statement with the total borrowings. Kd has been determined as net of tax (average tax rate).

Cost of Equity (K_e): K_e was calculated using the CAPM model. Return on the Nifty index was taken as the market return (R_m) and beta (β) from the Prowess database. The study used the book Debt Equity Ratio (DER) for calculating the K_e.

(ii) Market value Added

MVA as the excess of market value of capital (both debt and equity) over the book value of capital. If the MVA is positive, the company has created wealth for its shareholders.

Market Value Added = Company's total Market Value − Capital Invested

With the simplifying assumption that market and book value of debt are equal, this is the same as **Market Value Added = Market Value of equity − Book value of equity**

Book value of equity refers to all equity equivalent items like reserves, retained earnings and provisions. In other words, in this context, all the items that are not debt (interest bearing or non-interest bearing) are classified as equity.

Ehrhardt (2002) propose formula of MVA:

MVA = Total Market Value − Total Capital
= (MV of Stock + MV of Debt) − Total Capital

Where, MV of Stock = Market Capitalization = Shares Outstanding x Stock Price

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

Total Capital = Total Book Value of Debt and Equity

(iii) Cash Value Added

CVA is Cash Value added as another indicator of company's performance in the context of value creation over the reporting period. Valuation based this concept reflects the real increase in company's value over reporting period in cash flow term. It has been developed by Boston Consulting Group. The model presented here is called the Cash Value Added (CVA) model and is, in its design, very simple. It includes only cash items, i.e. Earnings before Depreciation Interest and Tax (EBDITA), adjusted for non-cash charges), working capital movement and non-strategic investments. The sum of those three items is the Operating Cash Flow (OCF). The OCF is compared with a cash flow requirement, "the Operating Cash Flow Demand" (OCFD). This OCFD represents the cash flow needed to meet the investor's finan-

Oil and Natural Gas Corporation Limited (ONGC): Table 1								
Regression with share price and accounting earning- based performance indicators								
	R	R square	constant			Slope		
			value	t	Signi.	value	t	Signi.
EPS	0.842**	0.709	-216.87	-1.03	0.327	14.125	4.685	0.001
ROCE	0.362	0.131	-58.74	-0.087	0.932	21.6	1.164	0.274
EBDITM	0.047	0.002	181.80	0.13	0.899	12.36	0.642	0.537

Oil and Natural Gas Corporation Limited (ONGC) Correlation analysis: table 2						
	EPS	ROCE	EBDITM	EVA	CVA	MVA
EPS	1					
ROCE	0.651*	1				
EBDITM	0.039	0.038	1			
EVA	0.572	0.675*	0.307	1		
CVA	0.256	0.256	0.577	0.853**	1	
MVA	0.308	0.128	0.495	0.723*	0.893**	1
*Significant at 5% level, **Significant at 1% level						

Oil and Natural Gas Corporation Limited (ONGC) :Table 3								
Regression with share price and value based performance indicators								
	R	R square	constant	slope				
			value	t	Signi.	value	t	Signi.
EVA	0.602*	0.362	181.152	0.711	0.495	0.009	2.159	0.051
CVA	0.606*	0.367	295.55	1.139	0.284	0.004	1.761	0.050
MVA	0.697**	0.486	310.366	1.897	0.09	0.08	2.919	0.017

cial requirements on the company's strategic investments, i.e. the capital cost.

CVA = Gross Cash Flow– Economic Depreciation– Capital Charge

Economic Depreciation = $[WACC/ (1+WACC)^n - 1]\star$ Depreciable Assets

Gross Cash flow = Adjusted profit + interest expense + depreciation

The another variant of CVA is used here is as follows:

CVA = Gross Cash Flow – Capital Charge

Or, CVA = (NOPAT + Depreciation + Amortisation) – Finance Cost

Finance Cost = Average Capital employed **x cost of Capital**

Relationship between market value of shares and accounting earnings based measures

The objective of the test is to test the hypothesis that there is no significant linear relationship between market value of shares and traditional accounting earning- based performance measures such as EPS, ROCE and EBDITA Margin (EBDITM). The results are shown in **Table1**. The result in-dicated that all the earning- based performance measure-ment showing positive correlation with the share price. EPS is significantly correlated (.842) with the share price at 1% level of significance. The variation of share price can be ex-plained by EPS 71% (R^2=.709) and the t test of the beta value (4.685) is significant at 1% level. Hence first sub null hypothesis is rejected at 99% confidence level showing that Share price has a meaningful relation with EPS. However, the other alternative hypothesis is accepted which indicates other earning-based indicators are not associated with value of shares of the company.

Relationship between accounting based measures and value-based measures

This paragraph would empirically examine the relationship between accounting based performance measures and value based performance measures with the help of multiple cor-relation analysis. The hypothesis of the study is to test the relation between value-based performance measures and traditional earning- based performance measures. The val-ue–Based measures consider here are Economic value add-ed(EVA), cash value added (CVA) and Market Value Added (MVA). The result indicates that EVA is not significantly as-

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sociated with traditional earning based performance measures except ROCE having moderate correlation with 5% level of significance. CVA is not significantly associated with traditional earning based performance measures. The same result is reflected when we consider MVA. So our hypothesis is rejected and we can comment that value based performance tools have week relation with traditional earning based tools. The result due to the reason that accounting earning based measures ignores the cost of capital.

Association between market value of shares and value-based performance measures

The objective of the test is to test the hypothesis that there is no significant linear relationship between market value of shares and value-based performance measures such as Economic value added (EVA), cash value added (CVA) and Market Value Added (MVA). The result summarized in table no.3. The results of correlation matrix reveal that all the value based performance measurement showing positive correlation with the share price and the result is significant. The correlation between share price and value based performance indicators can be summarized as MVA > CVA > EVA. The result of the regression analysis reveals. The explanatory power (R^2= 70%) is high for MVA and the slope is significant which indicates MVA influences the share price value significantly. Hence, we reject the hypothesis and comment that share price having good association with value-based measure. The result indicates there is strong association between cost of capital, cash flow and value of shares.

Conclusion and suggestions

Summing up the conclusion drawn from the study is as follows. This study reveals that all the traditional earning- a

based measure except EPS fails to capture the share price variation strongly. As an alternative, we introduced modern value-based performance measures like EVA, CVA, MVA and CFROI to judge the association with share price. The tools applied here to measure the performance of the company are not available in their annual report. They are computed based on the data available from the annual report of the company. Value-based measures have been obtained by adjusting accounting items and considering cost of capital. However, due to lack of information and for maintaining simplicity, the adjustments have been kept at a minimum level. The study shows if these value-based measures demonstrate an effective relationship with share price and could explain variations in share price significantly. If companies disclose this information in their annual report using standardized approach the effectiveness will be more to explain the share price variation. The moderate correlation between traditional earning-based measures and value-based measures force to conclude that disclosure of value-based measure is not supplementary to accounting earning-based measure rather complementary to each other. In this information era it is the right of the shareholder to know the value addition by the company on their investment to judge their performance and the shares accordingly.

Based on present study, the following suggestions with regard to new value-based performance measures and traditional performance measures are made which can go a long way to improve the financial performance measurement of Indian companies.

1. As per results of study, value-based measures like EVA, CVA and MVA have emerged as the effective performance measures along with the traditional measure, viz. EPS, ROCE, and EBITDA Margin. Considering the populari-

ty and the fundamental contribution of EVA and CVA in terms of its consideration of all the capital charges, including equity cost and real value addition measured by MVA, it should not be ignored by Indian companies as the use of these tools increases the awareness of capital cost of running a business.

2. SEBI and MCA (Ministry of Corporate Affairs) should issue some guiding principle for computation of EVA, CVA and MVA and its practice in financial reporting and accounting disclosures by the Indian companies. It should issue necessary guidelines making it mandatory for all the companies to disclose value-based performance measures in their financial statements.

3. As the traditional measures do not consider cost of capital employed, so it is better to disclose cost of equity , cost of borrowing and cost of capital employed in their annual report

4. Standardized norms should be recommended for calculation of traditional earning- based performance measurement like ROCE, ROA, ROE etc

Limitation of the study

1. The book value of capital invested was used as a measure of capital invested. Book value reflects accounting choices made over time and hence calculation may not be accurate.

2. For calculation of cost of capital, we have used the book value as weight instead of market value.

3. The study ignores the impact of inflation.

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