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EXPLAINING RETURN ON EQUITY: EVA VS. ACCOUNTING EARNINGS

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ABSTRACT

This study examines whether EVA (computed with the assumptions of constant and varying required return) outperforms accounting earnings by conducting relative and incremental information content analyses. Growing popularity of EVA in India and controversial results of prior studies are the reasons of conducting this study. For better validation, this study comprises 962 and 1157 sample data years of 74 large cap and 89 mid cap Indian companies over the period of 2017-2016 through 2005-2004, respectively. Relative information content analysis reveals that earnings outperform EVA in explaining changing rate of market price of equity. Incremental information content analysis report that earnings significantly increase the explanatory ability beyond that is provided by EVA computed with either assumptions. Thus, EVA cannot replace earnings as it has been claimed by EVA proponents. However, this study also supports to implement EVA as periodic performance measure as EVA computed with either assumptions maintains significant statistical relation with changing rate of market price of equity. Further, the results of empirical study recommends to implement EVA computed with constant required return.

Keywords: [1]EVA, EVAUCRR, EVAUVRR, CAPM.

1. INTRODUCTION

Increasing shareholders' return becomes the sole objective of management, which is a difficult task to accomplish because of high competition in the market. Management follows several methods to succeed in the market. One of the methods is measuring financial performance. It is a big challenge for the managers to select the proper financial performance measurement matric that can help them to measure the financial performance accurately. However, Stern et al. (1991)

1. EVA: Economic Value Added
2. EVAUCRR: Economic Value Added under the Assumption of Constant Required Return
3. EVAUVRR: Economic Value Added under the Assumption of Changing Required Return
4. CAPM: Capital Asset Pricing Model.

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suggested economic value added (EVA) measurement matric to overcome the problem. The superior stock return is the main selling point of EVA. The advertisements, publicity and successful stories encourage companies to adopt EVA. The list of USA companies adopt EVA are Coca-Cola, IBM, Procter and Gamble Johnson, Microsoft, General Electric Eli Lilly, Monsanto, Bausch and Lonb, AT &T. In India, the list companies adopt EVA are Infosys Technologies, BPL, HUL, NIIT, TCS, Godrej consumers product limited, Ranbaxy Laboratories Ltd. and Samtel India Limited. EVA is better than accounting earnings because it considers cost of capital, Lehn and Makhija (1996). It is a performance measurement tool that can measure value creation, Abdeen and Haight (2011). It drives stock prices and is the best measure of wealth creation, (Stewart 1994). Researchers like Stewart, 1995; Lehn and Makhija, 1997; Worthington and West, 2004; Chen and Dodd, 1997; Lefkowitz, 1999; Bao and Bao, 1998; Biddle et al. (1997); Shrma and Kumar(2011); Khan et al.(2016); Misra and Kanwal, 2005; Ahmed (2015) explain that EVA outperforms traditional accounting measures in explaining return on equity. Despite the anecdotal evidences, superiority of EVA over earnings in explaining return on equity is a logical and empirical question. The association of current rate of earnings with changing rate of earnings maintains greater association with stock returns, Easton and Haris (1991). Likewise, Goetzmann and Gartka (1999); Sparling & Turvey (2003); Turvey et al. (2000); Kramar and Pushner (1997); De Villers and Auret (1998)Gift et al., 2010; Biddle et al. (1997 & 1999); Ismail(2006); Kyriazis and Anastassis (2007); Sehrawat (2009); Raman (2005); Banerjee (2000); Sharma and Kumar (2012); Kim(2016) reveal that accounting measures better explain stock return compared to EVA. In India, the studies are conducted by Patel and Patel, 2012; Kumar and Sharma, 2011; Banerjee and Jain, 1999; Mittal et al., 2008; Sharma and Grover, 2015; Bhasin, 2013; Misra and Kunal, 2007; Altaf, 2016; Singh and Mehta, 2012; Bhatnagar et al., 2004; Poornima at al., 2015; Ramadan, 2016; Venkateshwarlu and Kumar, 2004; Shubita, 2013; Mangala and Joura, 2002 examine the performance of EVA vs. earnings in explaining return on stock and report the controversial results.

The principal feature of EVA measure is that, unlike traditional accounting measures, it reduces income by a charge for the cost of capital, Kim (2006). This charge has long been included in certain traditional measures of income that mainstream economists have used for more than century, McIntyre (1999). Cost of capital or required rate of return is the normal market return by Modigliani and Miller (1961). EVA is the difference between earnings and required earnings, where required earnings are determined by multiplying required rate of return with book value of capital. Therefore, required earnings can be presumed to be the average earnings of similar companies in the market under same risk factor. Stewart (1991) has assumed that required rate of return remains constant over time. Despite the popularity of EVA concept, the assumption of constant required return has attracted lot of criticism. The researchers like Campbell and Mei (1993); Hodrick(1992); Keim and Stambaugh (1986); Saha and Malkiel (2012); Feldstein

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(1980); Warr (2005); Ahrendsen and Khoju (1994); Turvey et al. (1995); Fama and French(1988) explain that required return never remains constant and change in stock prices happens more due to changing required return than due to changing cash flow.

The objective of study:

The controversial results of prior studies and the growing popularity of EVA in India encourage to conduct this study. The objective of this study is to investigate if EVA determined under the assumption of constant as well as varying or changing required return outperforms earnings in explaining changing market price of equity. This study conducts relative as well as incremental information content analyses to examine the explanatory ability of EVA and accounting earnings. In the process, the study also finds whether EVA computed with constant or varying required return maintains better relation with stock return. Relative information content analysis examines whether information content of EVA determined under each of the assumptions is better than that of earnings, whereas incremental information content analysis examines whether EVA determined under the assumption of constant and changing required return increases the explanatory ability or information content beyond that is provided by earnings.

It considers the sample data of 74 large cap Indian companies over the period of 2004-2005 through 2016-2017 and sample data of 89 mid cap companies over the period of 2004-2005 through 2016-2017. Overall results of this study reveal that earnings outperform EVA in explaining changing market value of equity. However, the evidence of this study suggests to implement EVA as performance measurement matric as it maintains significant association with changing rate of market price of equity.

The remainder of the study has arranged as follows: next, it focuses on the literature review. Third, this study focuses on methodology, where the procedure of finding EVA has been discussed. Fourth, it explains the sample and variables. Fifth, it discusses hypotheses and statistical model specification. Sixth, it focuses on empirical results and analyses. Seventh, it presents discussion and eighth outlines conclusion.

2. LITERATURE REVIEW

2.1 EVA outperforms Earnings:

EVA has significant explanatory ability in explaining stock return, Lehn and Makhija (1997). Worthington and West (2004) examine and compare the information content of EVA with traditional measures and elucidate that EVA is more associated with stock returns than accounting measures. EVA measure produces relatively more information than traditional measures, Chen & Dodd (1997). EVA maintains higher explanatory power over accounting measures, Bao and Bao (1998). Biddle et al. (1997) conducted incremental information content

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study using the sample of 773 US companies selected from Stern, Stewart and Co. over the period of 1984-1993 and observed that EVA has incremental information content beyond the information content by earnings. Sharma and Kumar (2011) conducted the incremental information content study considering sample of BT 500 and observed that EVA has incremental information content in addition to the information content by earnings. Khan et al. (2016) conducted very similar study by considering 28 non- financial firms listed in Karachi Stock Exchange and observed that EVA has incremental information content beyond the information content by earnings. O' Byrne(1996) reported that EVA explains more than twice as much of the variance of the market and capital ratio as it is explained by the accounting NOPAT. Misra and Kanwal (2005) studied the relationship of share price with EVA measure and traditional accounting measures using BSE-100 companies from the period of 1998-1999 through 2002-2003 and concluded that EVA has better association with market value of share compared to the traditional measures. The study has been conducted on 5 companies of Bangladesh and reported that EVA significantly explains share price, Ahmed (2015).

2.2 Earning Outperforms EVA:

Long term survival of companies probably more related to accounting earnings, and earnings per share does better than EVA in explaining differences across companies and in predicting future performance Goetzmann and Garstka (1999) . There is extremely weak correlation between EVA and shareholders' return, Sparling & Turvey (2003). Turvey et al. (2000) conducted study on 17 publicly traded food companies in Canada to find relation of EVA with stock market return and found no relationship between two. Explanatory ability of net operating profit is better than EVA in explaining market value, Kramar and Pushner (1997). While examining the explanatory ability of earnings in explaining stock prices in South Africa, it is observed that earnings outperforms EVA, De Villers and Auret (1998). Traditional measures are significantly related with stock returns compared to value added measures Peterson and Peterson (1996). EVA does not have better explanatory ability compared to traditional performance methods with respect to explaining market returns, Biddle et al. (1997 & 1999). EVA is not better in explaining stock return than traditional accounting measures, Ismail (2006). Information content of accounting measures is better than EVA, Kyriazis and Anastasis (2007). Sehrawat (2009) explained in his book entitled "EVA and Performance Measurement", where he analyzed companies for five financial years. He concluded that Earnings better explain the variations in share price compared to EVA. Variation in stock return is better explained by profit after tax than net operating profit after tax, Raman (2005). Market value of firm can be well predicted by future expected EVAs, Banerjee (2000). While conducting study on Indian companies, Sharma and Kumar (2012 finds that earnings per share (EPS) explains equity value better than EVA. Kim (2016) also examined

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the information content of earnings and EVA with respect to explaining market value of firm and found that EVA has very little correlation, whereas earnings maintain better relation.

2.3 Required Return Never Remains Constant:

It has been assumed that required return remains constant over time (Stewart 1991). The assumption of constant required return attract the attention of critics. Changes in stock are more due to change in total required returns than due to changes in the market's cash flow expectations Campbell and Mei (1993). Stock returns are predictable using interest rate variables, Hodrick (1992); Keim and Stambaugh (1986). Time-varying discount rates that are appropriate to value U.S start-up firms are considerably higher than those in traditional discounted cash flow models Saha and Malkiel (2012). Increase inflation results in decrease discount rate that leads to increase in value of asset Feldstein (1980). Even low inflation can induce significant distortions in EVA, Warr (2005). The assumption of constant discount rate cannot be accepted, Ahrendsen and Khoju (1994). The cost of capital never remains constant due to changing economy, Turvey et al. (1995) explained. Time varying discount rates are consistent with investors' preference for current against future consumption and stochastic evolution of their investment opportunities, Fama and French (1988).

2.4 Suggested Adjustments in Accounting Earnings may distort the Objective of EVA:

Stewart (1991) suggested to have 164 adjustments in accounting earnings to determine EVA accurately and it has attracted lot of criticism by other researchers. There is no theoretical or empirical evidence that EVA adjustments convert wrong accounting number into correct estimate value, and there is no economic theory to guide the selection of most relevant accounting variables that will be adjusted, Anderson et al. (2004). Adjustments to net operating income may remove accruals that used by the market to find the future prospectus of companies, Biddle et al. (1997). Data necessary to make the adjustments are difficult to obtain Petersons and Peterson (1996). Results of adjustments depend upon the assumptions and judgment that can vary from company to company making it difficult to conduct reliable comparison, Cates (1997).

It is necessary to ensure that the adjustments to cost of capital and adjustments to accounting profit need to be made in such a manner that comparison from year to year can accurately measure the performance, Chamberlain and Campbell (1995). As the objective of EVA is to evaluate the financial performance of specific company with respect to market, in order to determine EVA accurately, the variables of EVA i.e. (return on equity of specific company and normal market return) need to be kept at the same level.

The prior studies raise the following concerns.

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1. Should adjusted return on equity be compared with unadjusted normal market return to determine EVA?
2. Does EVA or accounting return explain changing rate of market price of equity better?

This study addresses the first concern by computing EVA through considering unadjusted return on equity. It conducts relative and incremental analyses to address the second one.

3. METHODOLOGY

3.1 The Procedure of Finding EVA:

The objective of EVA is to find the performance of specific company with respect to market by deducting cost of capital (required rate of return) from net operating profit after tax (NOPAT).

According to Stewart 1991,

EVA=NOPAT- weighted average cost of capital*capital employed, where NOPAT= Net operating profit after tax.

=NOPAT- {(cost of debt capital after tax* debt capital/capital employed) + (cost of equity capital* book value of equity capital/capital employed)}*capital employed

=NOPAT- cost of debt capital after tax* debt capital-cost of equity capital*book value of equity

= (NOPAT- cost of debt capital after tax* debt capital)-cost of equity capital* book value of equity

=Net profit after interest and tax (PAIT) - cost of equity capital* book value of equity

=Rate of return* book value of equity - cost of capital* book value of equity

= (Rate of return-cost of capital or required rate of return)*book value of equity…… (1)

3.2. Finding Required Rate of Return (normal market return):

Cost of capital (required rate of return) has been determined by using Capital Asset Pricing Model (CAPM).

Required rate of return= $r_f + \beta*(r_m - r_f)$…… (2)

Where r_f = risk free rate of return=average annual Treasury bond rate

r_m =expected market return= Annual BSE Sensex Index Return.

β= Covariance between return on equity of specific company and market return/ Variance of market return

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The study determines required return under the assumption of constant required return by holding risk free return, beta and market premium constant across the years. To keep risk free return, beta and market premium constant, this study considers the average of all these factors throughout the sample years. This study computes varying required return by considering annual risk free return and market premium that changes across the years, but remains same across the companies over the same years, and by considering beta factor that changes across the years and across the companies.

4. SAMPLE AND VARIABLES

4. 1. Sample:

In this study, the secondary data are used. The financial statements and average market value of equities of companies are collected from ACE Equity. Sample data of 74 large cap companies are collected over the period of 2004-2005 through 2016-2017. Initially, only the data of 74 large cap companies are considered for the study comprising 962 data years. To have the better exposition, the sample data of 89 mid cap companies of BSE 500 over 2004-2005 through 2016-2017 are considered later on and comprising 1165 data years.

4. 2. Variables:

This study follows the method adopted by Easton and Harris (1991), Chen and Dodd (1997) and Sharma and Kumar (2011).

Dependent Variable:

4.2.1. Changing Rate of Market Price of Equity (ΔRMPE): It is the rate of appreciation of market value of equity capital.

ΔRMPE= (Market value of equity of 't th' year – market value of equity of '(t-1)th year) / annual market price of equity of '(t-1)th' year. ΔRMVE is considered as dependent variable for regression analysis.

Independent Variables:

4.2.2. Rate of Accounting Return on Equity (RAROE): RAROE = Profit after Interest and Tax (PAIT)/ Average annual market price of equity of previous year Profit.

4.2.3. Changing Rate of Accounting Return on Equity (ΔRAROE): **ΔRAROE** = (PAIT of 't th' year – PAIT of '(t-1)th' year) / annual market price of equity of '(t-1)th' year.

4.2.4. Rate of EVA under Constant Required Return (REVAUCRR): REVAUCRR = (Rate of EVAUCRR)/ (annual market price of equity of previous year)

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4.2.5. Changing Rate of EVA under constant Required Return (Δ REVAUCRR): Δ **REVAUCRR** = (EVA of 't th' year – EVA of '(t-1) th' year) / average annual market price of '(t-1) th' year

Where EVA is determined under the assumption of constant required return.

4.2.6. Rate of EVA under Varying Required Return (ROEVAUVRR): **ROEVAUVRR** =EVAUVRR / Average annual market price of equity of previous year.

4.2.7. Changing Rate of EVA under Varying Required Return (ΔROEVAUVRR): Δ**ROEVAUVRR** = (EVAUVRR of 't th' year - EVAUVRR of (t-1)th year) / average annual market price of (t-1)th .

5. HYPOTHESES

This study implements relative and incremental information content approaches to investigate whether EVA (either determined under the assumption of constant required return or under changing required return) outperforms earnings. Relative information content comparisons are appropriate when making mutual exclusive choices among performance measures, whereas incremental information content comparisons assess whether one measure provides more information beyond that provided by other measures, Biddle et al. (1997). To examine the relative information content and incremental information content, this study develops models by following, Easton and Harris (1991); Sharma and Kumar (2011); Biddle et al. (1995); Kim (2006).

Here, the objective of conducting relative information content analysis is to find whether EVA determined either under the assumption of constant required return or under the assumption of changing required return outperforms earnings, whereas incremental information content analysis examines whether EVA determined under either assumptions(under the assumption of constant required return or changing required return) increases the information content beyond that is provided by accounting earnings in explaining changing rate of market price of equity.

H1: The relative information content of EVA either determined under the assumption of constant or under the assumption of changing required return is always better than earnings.

H2: EVA, either determined under the assumption of constant or changing required return, increases the information content beyond that is provided by earnings.

The rejection of H1 is interpreted as relative information content of earnings is better than the information content of EVA determined under the assumption of constant and varying required return). Rejection of H2 is interpreted as EVA does not increase (add) information content beyond that is provided by earnings.

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Table 1: Dependent Variable

Variables	Definition
ΔRMPE	(current year's average market price – last year's average market price)/last year's average market price

Table 1.2 Independent Variables

Variables	Definition
REVAUCRR	EVAUCRR of current year/Average market value of equity of last year
ΔREVAUCRR	(EVAUCRR of current year- EVAUCRR of last year)/Opening average market value of equity
REVAUVRR	EVAUVRR of current year/Average market value of equity of last year
ΔREVAUVRR	(EVAUVRR of current year- EVAUVRR of last year)/Average market value of last year
RAROE	Current year's PAIT/ Average market value of equity of last year
ΔRAROE	(Current year's PAIT- last year's PAIT) / Average market value of equity of last year

5.1. Relative Information Content Analysis:

Methodology of this study is similar to the methodology followed by Easton and Harris (1991), Sharma & Kumar (2011), Ismail (2008), and Biddle et al. (1997). The following three models examine the relative information content of EVA, earnings and required earnings by conducting ordinary least square regression analysis. Here i stands for companies of large cap and mid cap, while t stands for the time period which is 2003-2004 for large cap companies and 2004-2005 through 2016-2017 for mid cap companies. To conduct relative information content analysis, the study mostly compares the coefficient of determination of following three statistical models.

$\Delta RMPE_{it} = a_0 + a_1 RAROE + a_2 \Delta RAROE + e_{it}$ …… (Model-1)

$\Delta RMPE_{it} = b_0 + b_1 REVAUCRR_{it} + b_2 \Delta REVAUCRR_{it} + e_{it}$ …… (Model-2)

$\Delta RMPE_{it} = c_0 + c_1 REVAUVRR\ it + c_2 \Delta REVAUVRR_{it} + e_{it}$ …… (Model-3)

The pooled cross sectional data are used in each model. Statistical model 1 is without EVA, where statistical model 4 and 5 are with EVA determined under each of the assumptions.

5.2 Incremental Information Content Analyses:

To answer the second hypothesis, the study implements incremental information content approach with the objective of finding whether EVA measure adds to the information that is provided by earnings and uses F-statistics, t- statistics (coefficients significance), Pearson's correlation coefficient and coefficient of determinations. The present study is in line with Easton and Harris (1991); Sharma and Kumar (2011); Biddle et al. (1995).

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$\Delta RMPE_{it} = a_0 + a_1\ RAROE + a_2\Delta\ RAROE + e_{it}$ …… (Model-1)

$\Delta RMPE_{it} = b_0 + b_1\ REVAUCRR_{it} + b_2\Delta\ REVAUCRR + b_3\ RAROE + b_4\Delta RAROE + u_{it}$ … (Model-4)

$\Delta RMPE_{it} = c_0 + c_1 REVAUVRR\ it + c_2\Delta REVAUVRR_{it} + c_4\ RAROE + c_5\Delta\ RAROE + v_{it}$ .. (Model-5)

6. EMPIRICAL RESULTS AND ANALYSIS

6.1. Table 2 reports the summary of the dependent variable, changing return on market value of equity, and all the six independent variables. Panel A of table 2 reports that all the mean value of independent variables are positive. The positive mean value of rate of EVAUCRR and rate of EVAUVRR denote that most of the large cap companies earn more than their required earnings, whereas low values of these variables indicate in long run, companies are unable to earn more than their cost of capital because of high competition. Panel B of table2 reports that the mean value of EVAUCRR and EVAUVRR are negative. It indicates that most of the mid cap companies included here are earning less than their cost of capital.

Table 2: Description of Statistics

	Observations	Mean	Median	SD	Min	Max
Panel: A Large Cap Companies						
ΔRMPE	962	44.75	27.049	92.52	-65.05	2718.67
RAROE	962	10.3286	6.8012	12.944	-16.60	194.30
ΔRAROE	962	3.4975	1.12	12.51	-126.51	194.30
ROEVAUCRR	962	0.6393	1.2517	11.65	-54.20	182.45
ΔROEVAUCRR	962	0.9625	0.1297	11.236	-133.18	182.45
ROEVAUVRR	962	0.7833	1.2078	11.74	-44.89	185.65
ΔROEVAUVRR	962	0.9960	0.2355	11.92	-134.11	185.65
Panel: B Mid Cap Companies						
ΔRMPE	1157	43.04	20.283	106.4815	-82.48	1944.54
RAROE	1157	12.86	9.327	14.67	-69.89	188.26
ΔRAROE	1157	3.91	1.4357	13.03	-84.94	175.41
ROEVAUCRR	1157	-2.6478	-1.183	15.11	-124.30	144.75
ΔROEVAUCRR	1157	0.6577	-0.021	11.64	-94.21	159.41
REVAUVRR	1157	-2.8489	-1.268	14.89	-105.4	126.52
ΔROEVAUVRR	1157	0.4882	0.0125	12.08	-88.83	146.18

Note: ΔRMPE represents changing rate of market value of equity, RAROE represents rate of accounting return on equity, ΔRAROE represents changing rate of accounting return on equity, ROEVAUCRR represents rate of EVA under constant required return, ΔROEVAUCRR represents changing rate of EVA under constant required return, ROEVAUVRR represents rate of EVA under varying required return and ΔRPEVAUVRR represents changing rate of EVA under variable required return.

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6.2. Pairwise Correlation Study:

Table 3 reports the pairwise correlation between dependent and independent variables. It is observed that all the variables are positively and significantly associated with each other at less than 0.001 level. Panel A and panel B of table 3 reveal that rate of accounting return on equity and changing rate of accounting return maintain highest correlation with changing rate of market value of equity. This result rejects the claim of EVA advocates that EVA maintains better association with return on equity compared to accounting measures. It does not support the Hypothesis 1. Here, it is observed that correlation of RAROE> correlation of EVAUCRR>correlation of EVAUVRR with ΔRMPE. However, the highest correlation maintained by rate of accounting return on equity and changing rate of accounting return on equity are 65.4% and 66.4% for large cap companies and 47.3% and 47.3% are for mid cap companies respectively. ΔRMPE is 56.6% correlated with REVAUCRR is, 57.3% correlated with ΔREVAUCRR, 54% correlated with REVAUVRR and 52.5% correlated with ΔREVAVRR for large cap companies. Similarly, ΔRMPE is 35.4% correlated with REVA, 38.43% correlated with ΔREVAUCRR, 27% correlated with REVAUVRR, and 30.1% correlated with ΔREVAVRR for mid cap companies. It is observed that rate of accounting return on equity is 87.5% correlated with changing rate of accounting return on equity, 77.7% and 78.6% correlated with REVA and ΔREVAUCRR, 74% and 73% correlated with REVA and ΔREVAUVRR.

Table 3: Correlation Matrix

Panel: A Large Cap

	1	2	3	4	5	6	7
1. ΔRMPE	1						
2. RAROE	0.654*						
3.ΔRAROE	0.664*	0.875*	1				
4. REVAUCRR	0.566*	0.777*	0.749*	1			
5. ΔREVAUCRR	0.573*	0.786*	0.939*	0.767*	1		
6. REVAUVRR	0.540*	0.740*	0.730*	0.973*	0.778*	1	
7. ΔREVAUVRR	0.525*	0.730*	0.888*	0 .732*	0.974*	0.784*	1

Panel: B Mid Cap

1. ΔRMPE	1						
2. RAROE	0.473*	1					
3.ΔRAROE	0.473*	0.755*	1				
4. REVAUCRR	0.354*	0.681*	0.612*	1			
5.ΔREVAUCRR	0.384*	0.651*	0.917*	0.734*	1		
6. REVAUVRR	0.270*	0.616*	0.572 *	0.966*	0.749*	1	
7. ΔREVAUVRR	0.301*	0.547*	0.808 *	0.689*	0.966*	0.751*	1

Notes: Δ**R**MPE represents changing rate of market value of equity, RAROE represents rate of accounting return equity, ΔRAROE denotes changing rate of accounting return on equity, REVAUCRR represents rate of EVA under

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constant required return, ΔREVAUCRR represents changing rate of EVA under constant required return, REVAUVRR is for rate of EVA under varying required return and ΔRPEVAUVRR is for changing rate of EVA under variable required return. Cut off point of the significance of correlation is 5%. The correlation between the variables in above table are significant at less than 0.001 level.

6.3. Examining Relative Information Content of EVA under Each of the Assumptions and Earnings:

To further explore the association of earnings and EVAs with return on equity, the study conducts the regression analysis which is reported in table 4. In panel A (which is for large cap companies) of table 4, VIF factors indicate the absence of multicollinearity and heteroscedasticity. F factors 414.194 of model 1, 277.868 of model 2 and 224.217 of model 3 with cut-off point 5% indicate that the association of RAROE and ΔRAROE, the association of REVAUCRR and ΔREVAUCRR, as well as the association of REVAUVRR and ΔREVAUVRR with Δ**R**MPE are statistically significant at less than 0.001 level. It is observed that RAROE and ΔRAROE explains 46.2% variance of Δ**R**MPE, the association of REVA and ΔREVAUCRR of model 2 explains 36.6% variance of Δ**R**MPE, whereas the association of REVAUVRR and ΔEVAUVRR of model 3 explains 31.7% variance of Δ**R**MPE.

In panel B (which is for mid cap companies) of table 4, VIF factors indicate the absence of multicollinearity and heteroscedasticity. F factors 197.4, 118.16 and 64.347 between ΔRMPE and the association of RAROE and ΔRAROE), between ΔRMPE and the association of RAREVA and ΔRAREVA (model 2), between ΔRMPE the association of REVAUVRR and ΔREVAUVRR (model 3) indicate that all these independent variables are statistically significant at less than 0.001 level. The association of RARE and ΔRARE explains 46.2% variance of ΔRMPE, the association of REVAUCRR and ΔEVAUCRR of model 2 explains 16.9% variance of Δ**R**MPE, whereas the association of REVAUVRR and ΔEVAUVRR of model 3 explains 9.99% variance of Δ**R**MPE. Consistent with the result of correlation in table 3, the regression analyses report that the association RARE and ΔRARE for large cap and mid cap explain the highest 46.2% and 25.3% variance of Δ**R**MPE. The result of the relative information content analysis undermines the anecdotal stories of EVA and fails to support the first hypothesis (H1) that EVA under either assumption (constant or changing required return) better explains Δ**R**MPE compared to accounting return.

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Table 4: Relative Information Content Analysis:

	Model 1 (RAROE, ΔRAROE)		Model 2 (REVAUCRR, ΔREVAUCRR)		Model 3 (REVAUVRR, ΔREVAUVRR)	
Panel: A: Large cap						
F-Statistics	414.194		277.868		224.217	
p- Value	0.000		0.000		0.000	
R^2	46.36%		36.7%		31.9%	
Adjstd. R^2	46.2%		36.6%		31.7%	
D-W Ratio	2.03		2.06		2.031	
	RAROE	ΔRAROE	REVAUCRR	ΔREVAUCRR	REVAUVRR	ΔREVAUVRR
Coefficient	3.584	4.14	3.625	4.233	3.996	3.245
t- value	6.43	7.93	7.682	8.422	7.769	6.142
VIF	4.263	4.26	2.425	2.425	2.594	2.594
P Value	0.000	0.000	0.000	0.000	0.000	0.000
Panel: B Midcap						
	(RAROE&ΔRAROE)		(REVAUCRR&ΔREVAUCRR)		(REVAUVRR&ΔREVAUVRR	
F-Statistics	197.4		118.160		64.34	
p-value	0.0		0.000		00.00	
R^2	25.5%		17.000%		10.00%	
Adjstd. R^2	25.3%		16.9%		9.99%	
D-W Ratio	1.874		1.923		1.89	
	RAROE	ΔRAROE	REVAUCRR	ΔREVAUCRR	REVAUVRR	ΔREVAUVRR
Coefficient	1.949	2.210	2.453	1.332	1.555	1.141
t-value	6.93	6.98	7.886	5.564	5.957	3.545
VIF	2.326	2.326	1.607	1.607	1.71	1.71
P Value	0.000	0.000	0.000	0.000	0.000	0.000

Notes: RAROE represents return on accounting return on equity ΔRAROE represents changing rate of accounting return on equity, ROEVAUCRR denotes rate of EVA under assumption of constant required return, ΔREVAUCRR symbolizes changing rate of EVA under the assumption of constant required return, REVAUVRR is for rate of EVA under varying or changing required return, ΔREVAUVRR represents changing rate of EVA under varying required return. All the variables maintain the statistical significant relation with equity return at 0.001 level. R^2 of model 1> R^2 of Model 2 and R^2 of Model 3.

6.4. Examining Incremental Information Content:

To determine the incremental information content of EVA under both the assumptions, this study considers the regression model 1, model 4 and model5. The explanatory abilities of model 4 and model 5(separately) are compared with the explanatory ability of model 1. Model 1 is the association of RAROE and ΔRAROE. Model 4 is the association of RAROE, ΔRAROE, REVA and ΔEVAUCRR, whereas model 5 is the association of RAROE, ΔRAROE, REVAUVRR and ΔREVAUVRR. Panel A of table 5 is for large cap companies, whereas panel B of table 5 is for mid cap companies.

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Panel A of table 5 reports the incremental information content of EVA vs. accounting return on equity of large cap companies. F-factor of the association of four variables (RAROE, ΔRAROE, REVAUCRR and ΔEVAUCRR) with Δ**R**MPE is 228.23. It denotes the statistical significance at less than 0.001 level. Durbin and Watson (D-W) number 1.989 indicates the absence autocorrelation within the variables. The coefficient of REVAUCRR in model 4 is statistically significant at 0.01 level, while the coefficients of all the other variables (RAROE, ΔRAROE, and ΔEVAUCRR) are statistically significant at less than 0.001 level. VIF factor indicates that there is multicollinearity exist in the sample data of ΔRAROE and ΔEVAUCRR as it is higher than 10 (Belsley et al. 1980), while VIF factors of rest of the variables indicate the absence of multicollinearity. Further, the association of four variables (RAROE, ΔRAROE, REVAUCRR and ΔEVAUCRR) of model 4 in panel A explains 48.6% variability of ΔRMVE. This result indicates that the association of REVAUCRR and ΔEVAUCRR of model 4 increase the explanatory ability by 2.4%(48.6% to 46.2%) beyond that is explained by the association of RAROE and ΔRAROE of model 1(it is reported in panel A of table 4).

Model 5 of Panel A reveals that the association of four variables (RAROE, ΔRAROE, REVAUVRR and ΔEVAUVRR) of model 5 maintains F value 228.276 with RAROE and indicates the statistical significance at less than 0.001 level. Further, Durbin and Watson (D-W) number 1.968 indicates the absence of autocorrelation within the variables. VIF factors of all the variables of model 5 except ΔRAROE indicate the absence of multicollinearity. The coefficients of REVAUVRR in model 5 is statistically significant at 0.009 level, while all the other variables(RAROE, ΔRAROE, REVAUVRR and ΔEVAUVRR) are statistically significant at less 0.001 level. Further, model 5 of panel A indicates that the association of four variables explain 48.6% variability of Δ**R**MPE. This result indicates that the association of REVAUVRR and ΔEVAUVRR of model 5 increases the explanatory ability by 2.4%(48.6% from46.2%) beyond that is explained by the association of RAROE, ΔRAROE of model 1(it is reported in panel A of table 4) which is statistically significant.

Panel B of table 5 reports the incremental information content of EVA vs. earnings of mid cap companies. F-value 104.544 indicates the association of four variables (RAROE, ΔRAROE, REVAUCRR and ΔEVAUCRR) of model 4 maintains statistical significant relation at less than 0.001 level with Δ**R**MPE. Durbin and Watson (D-W) number 1.903 indicates the absence of autocorrelation within the variables. The coefficient of EVAUCRR in model 4 does not have significant relation with market rate of return, while all the other variables are statistically significant at less 0.001 level. VIF factor indicates the absence of multicollinearity. Further, panel A indicates that the association of four variables (RAROE, ΔRAROE, REVAUCRR and ΔEVAUCRR) of model 4 explains 26.4% variability of Δ**R**MPE. It indicates that association of REVAUCRR and ΔEVAUCRR in model 4 increases the explanatory ability by 1.1% (25.3% to

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26.4%)beyond that is explained by RAROE, ΔRAROE in model 1(it is reported in panel B of table 4).

F- value 115.198 indicates that the association of four variables (RAROE, ΔRAROE, REVAUVRR and ΔEVAUVRR) of model 5 maintains statistical significant relation at less than 0.001 level with Δ**R**MPE. Durbin and Watson (D-W) number 1.888 indicates the absence of autocorrelation present within the variables. VIF factors of all the variables of model 5 indicate the absence of multicollinearity. The coefficients of REVAUVRR in model 5 is statistically significant at 0.018 level, while all the other variables are statistically significant at less 0.001 level. Further, model 5 of panel A indicates that the association of four variables (RAROE, ΔRAROE, REVAUVRR and ΔEVAUVRR) explains 28.2% variability of market rate of return on equity. It indicates that REVAUVRR and ΔEVAUVRR in model 5 increase the explanatory ability by 3%(25.3% to 28.3%)beyond that is explained by RAROE, ΔRAROE in model 1(it is reported in panel B of table 4).

The result of incremental information content analyses conducted on large and mid-cap companies supports H2 hypothesis and reports that EVA under the assumption of constant and changing required return marginally increases information content beyond that is provided by earnings.

On the other hand, panel A of table 5 reports that the R^2 of the association of four variables of model 4 (RAROE, ΔRAROE, REVAUCRR and ΔREVAUCRR) explains 48.6% which is more by 12%(from 36.6% to 48.6%) compared to the explanatory ability of the association of REVAUCRR and ΔREVAUCRR (reported in panel A of table 4 and formulated in statistical model 2). It indicates that the association of RAROE and ΔRAROE increases explanatory ability by 12% beyond that is provided by the association of REVAUCRR and ΔREVAUCRR. Similarly, it is observed that the presence of the association of RAROE, ΔRAROE in model 5 increases R^2 by 16.9% (from 31.7% to 48.6%) compared to the explanatory ability of the association, REVAUVRR and ΔREVAUVRR.

Therefore, the association of RAROE, ΔRAROE increases explanatory ability by 12% beyond that is provided by rate of EVA with constant required return and rate of accounting return on equity increases R^2 by 16.9% beyond that is provided by the association of REVAUCRR and ΔREVAUCRR.

Similarly, panel B of table 5 reports that R^2 of the association of RAROE, ΔRAROE, REVAUCRR and ΔREVAUCRR increases the explanatory ability by 9.5% (from 16.9% to 26.4%) beyond it is explained by the association of REVAUCRR and ΔREVAUCRR (16.9% reported in panel B of table 4 of model 2). Further, R^2 of the association of RAROE, ΔRAROE, REVAUVRR and ΔREVAUVRR with RMVE increases by 18.31% (from 9.99% to 28.3%)

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beyond that is provided by REVAUVRR and ΔREVAUVRR (9.9% reported in panel B of table 4 of model 3). It indicates that the association of RAROE, ΔRAROE increases the explanatory ability by 9.5% beyond that is provided by the REVAUCRR and ΔREVAUCRR. Further, the association of RAROE and ΔRAROE increases the explanatory ability by 18.31% beyond that is provided by the association of REVAUVRR and ΔREVAUVRR.

This result is opposite of the result of the study conducted by Chen and Dodd(1997), but in parallel with the results of the studies conducted by Worthington and West (2001); Sharma and Kumar (2011); Ismail(2006); Kim(2006);Biddle et al. (1998).

Table 5: Incremental Information Content Analysis:

Model 4 and Model 5:

Category	Coefficients	t-value	p-value	VIF
Panel: A Large cap				
Model 4 RAROE and EVAUCRR in Explaining ΔRMPE				
RAROE	1.628	2.576	0.01	5.732
ΔRAROE	9.104	9.463	0.000	15.273
REVAUCRR	2.199	4.533	0.000	3.163
ΔREVAUCRR	-6.099	-6.457	0.000	10.578
R^2=0.488 or 48.8%, R^2a=0.486 or 48.6%, F value=228.23, P=0.000, D-W =1.959				
Model 5: RAROE and EVAUVRR in Explaining ΔRMPE				
RAROE	1.644	2.629	0.009	5.610
ΔRAROE	7.945	9.904	0.000	10.621
REVAUVRR	2.453	4.870	0.000	3.306
ΔREVAUVRR	-4.965	-6.625	0.000	6.934
R^2=0.488 or 48.8%, Adjstd R^2=0.486 or 48.6%, F =228.276 P=0.00 0 D-W=1.968				
Panel: B midcap				
Model 4 RAROE and EVAUCRR in Explaining ΔRMPE				
RAROE	1.599	5.048	0.000	2.99
ΔRAROE	4.341	7.209	0.000	8.533
REVAUCRR	0.351	1.372	0.340	2.077
ΔREVAUCRR	-2.545	-4.223	0.000	6.814
R^2=0.266, Adjstd. R^2=0.264, F-value=104.544, P value=0.000, D-W Ratio=1.903				
Model 5 RAROE and EVAUVRR in Explaining ΔRMPE				
RAROE	1.318	4.23	0.000	2.970

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ΔRAROE	4.574	10.004	0.000	5.052
REVAUVRR	0.622	2.379	0.018	2.153
ΔREVAUVRR	-2.982	-6.978	0.000	3.791

R^2=0.286, Adjstd R^2=0.283, F-value=115.198, P-value=0.000, D-W Ratio=1.888

Note: RAROE represents rate of accounting return on equity ΔRAROE represents changing rate of accounting return on equity, REVAUCRR denotes rate of EVA under assumption of constant required return, ΔREVAUCRR symbolizes changing rate of EVA under the assumption of constant required return, REVAUVRR is for rate of EVA under varying or changing required return, ΔREVAUVRR represents changing rate of EVA under varying required return.

7. DISCUSSION

This study finds EVA under the assumption of constant and changing required return which is presumed to be the real scenario of market in order to comply with the assumption of Stewart 1991 that required return remains constant and to comply with the suggestions of its critics (that required return never remains constant). While determining EVA, this study justifies that the suggested adjustments in accounting earnings may distort the core objective of EVA of evaluating the performance of specific company with respect to market. Therefore, this study determines EVA without making any adjustments in accounting earnings. It follows the suggested model of Easton and Harris (1991) for all the variables and examines their information content using relative and incremental information content analyses.

The result of the relative information analysis does not support the EVA proponents and reveals that earnings outperform EVA for large cap and mid cap companies under each of the assumptions. The relative information content study rejects the hypothesis 1 and claims that explanatory ability of earnings is better than that of EVA under both the assumptions. For large cap companies, the incremental information content analysis reports that EVA computed with constant/ varying required return marginally increases (2.4%) explanatory ability beyond that is provided by earnings. Similarly, for mid cap companies, incremental information content analysis reports that EVA computed with constant required return increases 1.1% explanatory ability(information content) beyond that is provided by earnings and EVAUVRR increases 3% explanatory ability beyond that is provided by earnings. Thus, it accepts hypothesis 2 as EVA under both the assumptions increase or add marginally information content beyond that is provided by earnings and they are statistically significant. On the other hand, for large cap companies, earnings increase the explanatory ability by 12% and 16.9% beyond that is provided by EVAUCRR and EVAUVRR, respectively. Similarly, for mid cap companies, earnings increase 9.5% and 18.31% explanatory ability beyond that is provided by EVAUCRR and EVAUVRR, respectively..

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The result of this study is in agreement with the results of the studies conducted by Sharma and Kumar (2011); Biddle et al. (1996); Khan et al. (2016).

This study differs from other studies by

1. Determining EVA without any adjustment in accounting earnings and logically justifying that the adjustment may distort the objective of EVA.

2. Examining whether EVA computed with the assumption of constant required return outperforms EVA computed with varying required return.

3. Implementing Easton and Harris (1991)'s model for all the variables and deflating all the matrices by dividing with market value of equity determined at the end of previous year to bring uniformity in the process of determining independent and dependent variables so that their efficiency can be compared effectively in explaining market return on equity.

8. CONCLUSION

This study examines whether EVA computed under constant as well as varying required return outperforms accounting earnings in explaining changing rate of market value of equity. It attempts to keep all the dependent and independent variables in the comparable level to better evaluate their performance, while computing EVA under constant and varying required return. The overall result of the present study reveals that earnings outperform EVA in explaining changing rate of market value of equity and EVA determined under each of the assumptions marginally increases the explanatory ability beyond that is provided by earnings. Therefore, EVA cannot replace earnings in explaining changing rate of market value of equity. However, the evidence of this study supports EVA computed with the assumption of constant required return to be implemented as period performance measure as it maintains better and stronger association with changing rate of market price of equity compared to EVA computed with varying require return. Even though earnings maintain better association with rate of changing market price of equity, it still can explain less than 50% variance of equity return. It advocates that besides quantitative factor, there are qualitative factors including innovative activities, manager's convincing ability, and relation with customers etc. responsible to explain the unexplained variance of return on equity. The methodology and the result of this study can serve as guide to the practitioners and academicians. This study recommends to use discounted valuation models including EVA discounted valuation model which may help to explain the greater variation of market value of equity.

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