

Economic value-added (EVA) myths and realities: evidence from the Indian manufacturing sector

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Abstract

Purpose – The main aim of this paper is to examine the claim that economic value added (EVA) advocates its superiority over the traditional accounting-based financial performance measures, i.e. profit after tax (PAT), earnings per share (EPS), return on assets (ROA), return on equity (ROE) and return on investment (ROI) in the Indian manufacturing sector and at the same time, give empirical facts. It also tests and examines the information content of various performance measures and their relationship with stock returns.

Design/methodology/approach – The paper uses the sample of 534 Indian manufacturing companies from the Bombay Stock Exchange (BSE) during the period 2000–2018. Multiple regression models are applied to examine the information content of EVA and traditional performance measures in explaining shareholders' returns.

Findings – Relative information content tests revealed that traditional accounting-based measures such as EPS, ROE and ROA performed better than EVA in explaining the returns of Indian manufacturing companies. Incremental information content of EVA adds little contribution to information content above traditional performance measures. The claim of superiority of EVA over accounting-based measures in association with shareholder returns is proved invalid in Indian manufacturing companies.

Originality/value – This study concludes that EVA has no superiority over traditional accounting-based financial performance measures in explaining stock returns of Indian manufacturing companies. To achieve heftiness in outcomes, panel data are tested by using Breusch–Pagan–Godfrey (BPG) test for heteroskedasticity, Hausman's test for fixed and random effect, variance inflation factor (VIF) test for multicollinearity and Durbin–Watson test for autocorrelation.

Keywords Economic value added (EVA), Traditional performance measures, Indian manufacturing companies, Relative information content, Incremental information content

Paper type Research paper

1. Introduction

In recent years, the most important business aim is to generate value and wealth for shareholders. Shareholder vigorosity has got an extraordinary level partially because of developments in regulatory reforms (in the context of investors' protection and disclosure requirements) and incorporation of financial institutions and markets. These developments have guided to increase force on companies to enhance shareholders worth in the competitive world. Companies, which have the main concern on shareholder value, are much healthier and develop the overall economy. A question arises on how do we create shareholder value and



how do we measure accurately shareholder value? Finding an answer to this question is very complex and difficult as the business world is continuously observing the beginning of new shareholder value creation measures. Therefore, an ever-increasing array of research findings eliminate the difficulty in the creation of new measures and declares shareholder value creation. Traditional accounting-based financial performance measures such as profit after tax (PAT), earnings per share (EPS), return on assets (ROA), return on equity (ROE) and return on investment (ROI), etc. compute shareholder value creation. Now, these measures are criticized as a result of the inability to fit in the total cost of capital, time value of money, cash flows and accrual-based accounting conventions. Furthermore, they do not offer strategic value management direction. Drawbacks in traditional measures give a golden opportunity for modern value-based measures as economic value added (EVA), cash value added (CVA), shareholder value added (SVA), economic profits (EP), cash flow return on investment (CFROI), market value added (MVA), etc. In the last three decades, the modern value-based financial performance system has achieved recognition in academic literature. One of the most important innovations in these measures is EVA supported and initiated by US-based consultant firm Stern Stewart and Company. [Stewart \(1991\)](#) found that EVA is superior to accounting-based performance measures (including ROA, ROE and EPS) in explaining changes in shareholder wealth. Also, [Lefkowitz \(1999\)](#) carried similar findings as Stern Stewart. Indian companies support the Stern Stewart hypothesis that EVA is better than traditional accounting-based measures in association with stock returns, and the measure adds more wealth to shareholders than conventional measures ([Sikarwar & Gupta, 2016](#)). [Uyemura, Kantor, and Petit \(1996\)](#) revealed that EVA has more relevant and incremental information than traditional measures, including NI, ROE, ROA and EPS. Further, [Lehn and Makhija \(1996\)](#) found a high correlation between EVA and stock returns. The results present EVA as a better long-run performance measure than traditional accounting-based financial performance measures. Also, EVA is a prominent part of management control systems ([Chen & Dodd, 2001](#)).

EVA is a variation in the residual income concept in which a minimum of 164 potential accounting adjustments are recommended that used to make accounting adjustments to construct EVA. The Indian financial reporting system does not oblige to show EVA disclosure in the financial statement. This shortcoming creates a problem for different stakeholders to judge the performance based on the EVA concept.

This study compares EVA and traditional accounting-based financial performance measures such as PAT, EPS, (ROA, ROE and ROI in explaining the shareholder returns using a sample of 534 Indian manufacturing companies for the period 2000–2018. This study also examines and correlates these variables with stock returns as an external measure of performance to find whether EVA is better linked with stock returns as compared to accounting earning-based measures. The outcomes of this study can help stakeholders to find out which variable adds more information to stock returns.

The rest of this article is structured as follows: literature review, data and methodology, statistical model specifications, results and analysis, summary and conclusion followed by limitations and suggestions for future research.

2. Literature review

In corporate finance, there is an emergent discussion on which performance measures give precise details changes in shareholder return or market value of the firm. Some studies conduct an empirical analysis to examine the claim of Stern Stewart and Company that EVA is the best explanatory performance measure over traditional accounting-based measures in its association with the market value of the firm or stock returns. On the other hand, some studies refused Stern Stewart's claim that EVA is superior to other traditional measures in

association with the market value of the firm or stock returns. Therefore, the results of empirical studies are controversial and questionable due to descriptive efficiency and quantifying the significance of modern value-based financial performance measures or accounting-based measures. This segment provides some major studies on the subject of corporate performance measurement.

2.1 Empirical studies advocating traditional accounting-based financial performance measures

Using different information content tests and a sample of 108 companies (33 non-EVA users and 75 EVA users), [Palliam \(2006\)](#) refuted the claim that highly reputed and widely accepted metrics for EVA users are superior to non-EVA users. Further, [Biddle, Bowen, and Wallace \(1998\)](#) revealed that no evidence claims EVA is more closely associated with equity returns or firm value. [Chen and Dodd \(1997\)](#) found a weak relationship between EVA and stock returns. [Kim \(2006\)](#) also advocated that free cash flow and net operating profit after tax (NOPAT) have more exploratory power over EVA in explaining the firm value. EVA adds slightly to information provided by NOPAT and free cash flow. [Ismail \(2006\)](#) viewed that operating cash flow and accruals have more relative and incremental information content than EVA in explaining the stock returns. [Ismail \(2008\)](#) also favoured the traditional measure, and EPS has more exploratory power than EVA in explaining stock returns. [Alipour and Pejman \(2015\)](#) stated that traditional measures such as ROA and ROS have more power to explain the market value of the firm as compared to EVA. [Fayed and Dubey \(2016\)](#) highlighted that value-based measures have little relative and information significance in explaining total shareholder returns. [Peterson and Peterson \(1996\)](#) found no strong association between EVA and other value-based measures over the traditional accounting measures to explain stock returns. Many other studies found that conventional accounting-based financial performance measures such as net income, PAT, EPS, ROA, cash flow from the operation and return on net worth (RONW) are more related to stock returns or market value in comparison to EVA or other value-added measures ([Kumar & Sharma, 2011a, b](#); [Erasmus, 2008a, b](#); [Ramana, 2007](#); [Eljelly & Alghurair, 2001](#); [Kramer & Pushner, 1997](#); [Meditinos, Sevic, & Theriou, 2007](#)). The above mention studies are in favour of traditional accounting-based financial performance measures.

2.2 Empirical studies sponsoring value-based financial performance measures

Some researchers like [Stewart \(1991\)](#), [Rappaport \(1986\)](#) and [Ehrbar \(1998\)](#) advocated EVA for its capability to incorporate the full cost of capital than traditional performance measures. [Athanasakos \(2007\)](#) advocated that adopters of EVA have very much power to explain stock price performance in comparison with nonadopters of EVA. In a similar study, [Kleiman \(1990\)](#) compared the stock returns performance of EVA adoption companies and non-EVA adoption companies in the USA during the period 1987–1996. The results indicated that the stock market performance of EVA adoption companies is significantly better than that of their industry competitors. EVA adoption gives a boost in cash flow measures and profitability level after the implementation of EVA ([Tortella & Brusco, 2003](#); [Ferguson, Rentzler, & Yu, 2006](#)). [Bacidore, Boquist, Milbourn, and Thakor \(1997\)](#) methodically focused on a firm's stock price performance for the measurement of shareholder wealth creation and concluded that there is a correlation between EVA and stock returns of shareholder wealth creation rather than NOPAT, WACC, economic book value of assets and market value of assets. [De Medeiros \(2005\)](#) also presented the high level of relationship of EVA with stock returns in his research. Furthermore, [Ehrbar \(1999\)](#) favoured the superiority of EVA and market value adder over the accounting measures as discounted cash flows, earnings and EPS, etc.

Considering the literature, we found that most studies in the area of value-based financial performance measures in the manufacturing sector were conducted in developed countries

like the USA, Japan, UK, France and Germany. In contrast, studies on value-based financial performance measures in the manufacturing sector in developing countries like India are scarce. Therefore, the literature review provides scope for research on the Indian manufacturing sector. So, there is an apparent necessity to explore the financial performance measure in the context of Indian manufacturing industries.

3. Data and methodology

3.1 Sample and data

The sample consists of 534 Bombay Stock Exchange (BSE) listed Indian manufacturing companies from 2000 to 2018 for which data were accessible. In the beginning, a sample of 18544 companies was chosen from the manufacturing sector (as classified by the Prowess IQ Database maintained by the Centre for Monitoring Indian Economy (CMIE)). The sample was built using the following selection criteria; the first criterion is that only those companies are to be selected for this study that remain listed at least for 15 years and which reported their data on the majority of the relevant variables. Second, only those companies selected are to be top in the criteria of the market capitalization of the year 2016. The final sample consists of 534 companies with a balanced panel set of 10146 observations because of any missing data.

3.2 Variable description

The hypothetical model of this study allows for PAT, EPS, ROA, ROE, ROI and EVA as independent variables. The dependent variable that is identified in the literature review is stock returns. This study examines the information content of traditional measures and EVA with the stock returns of the companies. The method of the present research is similar to that of [Biddle et al. \(1998\)](#), [Erasmus \(2008a, b\)](#), [Ramana \(2007\)](#), [Kim \(2006\)](#), [Irala \(2005\)](#), [Kumar and Sharma \(2011a, b\)](#), [Hall \(2016\)](#) and [Sikarwar and Gupta \(2016\)](#). Prowess IQ is our source of data collection in this study. All sample variables are calculated over the 19 years for all firms under the study.

3.2.1 Economic value added (EVA). In 1991, Stern Stewart and Company described EVA as an excess of NOPAT, less with capital charge. They developed and marketed the concept of EVA as a simple variant of residual income. They systematically constructed the calculation of residual income with a sequence of 164 accounting adjustments. Though the definite number of adjustments would rely on operating GAAP (Generally Accepted Accounting Principles) of a country, EVA is computed as follows:

$$EVA_t = NOPAT_t - WACC_t * CAPITAL_{t-1}$$

where EVA_t = Economic value added in the period “t”,

$NOPAT_t$ = Net operating profit after tax in the period “t”,

$WACC_t$ = Weighted average cost of capital in the period “t”,

$CAPITAL_{t-1}$ = Capital employed in the previous period year “t-1”,

NOPAT presents the net operating profit after tax with some adjustments as follows:

= Net income to common shareholders,

Plus research and development expenses,

Plus goodwill amortization,

Plus extraordinary losses (minus gains) after tax,

Plus increase in bad debt reserves and

Plus LIFO reserves.

The *weighted average cost of capital (WACC)* provides the minimum rate of return to the company that it may gratify the investors to on their investments.

The calculation of the weighted average cost of capital is as follows:

$$WACC = W_e K_e + W_p K_p + W_d K_d$$

where

WACC = Weighted average cost of capital,

W_e = Proportion of equity capital in capital,

K_e = Cost of equity capital,

W_p = Proportion of preference capital in capital,

K_p = Cost of preference capital,

W_d = Proportion of debt in capital and

K_d = Cost of debt.

The calculation of the cost of capital is as follows:

Cost of capital = cost of equity*percentage of equity from capital + cost of debt*percentage of debt from capital + cost of preference capital *percentage of preference capital from the capital.

The following equation states the cost of equity:

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

where

K_e = cost of equity,

R_f = risk-free rate of return,

β_i = sensitivity of stock to the overall market return and

R_m = market rate of return.

Cost of preference capital has been calculated as follows:

$$K_p = \frac{\text{Preference Annual Dividend}}{\text{Issue Price of Preference Share}}$$

The cost of debt has been calculated as follows:

$$K_d = \frac{\text{Total Interest Expenses}}{\text{Total Borrowings}}$$

Invested capital (IC) also called capital employed which describes as net assets beginning of the year in a company. For the manufacturing company, the computation of invested capital is as follows:

= Net assets beginning of the year,

Minus marketable securities and construction in progress,

Plus bad debt reserves,

Plus non-capitalized lease,
 Plus LIFO reserves,
 Plus cumulative amortization of goodwill and
 Plus research and development expenses.

3.2.2 *Stock returns are calculated as follows.*

$$SR_{it} = \frac{P_{it} - P_{i(t-1)} + D_{it}}{P_{i(t-1)}}$$

where SR_{it} = the stock returns of company “i” in the period “t”.

P_{it} = the stock market price of company “i” in the period “t”.

$P_{i(t-1)}$ = the stock market price of company “i” in the previous period “t-1”.

D_{it} = dividend of company “i” in the period “t”.

3.2.3 *PAT is computed as follows.*

$$\text{Profit after Tax (PAT)}_{it} = \text{Revenue}_{it} - \text{Expenses}_{it}$$

3.2.4 *EPS is calculated by dividing the net profit after tax and preference dividend by the number of outstanding shares of the company.*

$$EPS_{it} = \frac{PAT_{it} - \text{Preference Dividend}_{it}}{\text{Number of outstanding shares}_{it}}$$

3.2.5 *ROA is computed by dividing the net profit after tax by the total assets employed in the business.*

$$ROA_{it} = \frac{PAT_{it}}{\text{Total Assets}_{it}}$$

3.2.6 *ROE measures the efficiency and profitability of the firm by dividing the net profit after tax by the equity share capital (paid-up) that is employed in the business.*

$$ROE_{it} = \frac{PAT_{it} - \text{Preference Dividend}_{it}}{\text{Equity share capital (paid - up)}_{it}}$$

3.2.7 *ROI measures profitability by dividing the net profit after tax by the capital employed that employed in the business.*

$$ROI_{it} = \frac{PAT_{it}}{\text{Capital Employed}_{it}}$$

3.3 Hypothesis of the study

Review of literature arose to these objectives:

- (1) Is there any association between various traditional performance measures (PAT, EPS, ROA, ROE and ROI) and stock returns?
- (2) In the context of relative information content, which one is the best performance measure among various traditional performance measures?

- (3) Is the incremental information content of traditional performance measures higher than the relative information content of traditional performance measures in explaining stock returns of Indian manufacturing companies?
- (4) Is the incremental information content of EVA superior to that provided by PAT, EPS, ROA, ROE and ROI in explaining stock returns of Indian manufacturing companies?

To achieve these objectives, the following hypotheses are developed and tested:

- H1. There is a correlation between various traditional performance measures (PAT, EPS, ROA, ROE and ROI) and stock returns.
- H2. The relative information content of various traditional performance measures has superiority for explaining stock returns of Indian manufacturing companies.
- H3. The incremental information content of traditional performance measures is better than the relative information content of traditional performance measures in explaining stock returns.
- H4. EVA includes more information content in explaining the stock returns of Indian companies.

These hypotheses were examined using the methodology illustrated in the next section.

4. Statistical model specifications

Our methodology is based on the most of earlier studies cited in this article, i.e. [Kim \(2006\)](#), [Ismail \(2008\)](#), [Kumar and Sharma \(2011a, b\)](#), [Alipour and Pejman \(2015\)](#) and [Hall \(2016\)](#). These studies applied ordinary least squares (OLS) regression model for a set of cross-sectional time-series data. This regression technique significantly improves the validity of the regression outcomes and also provides more reliable results for the cross-sectional time-series data. The present study examines the relative and incremental information content of different traditional performance measures and their relationship with stock returns using this model. To get second objective, we constructed five univariate regression models to find out the explanatory power of select variable using relative information content regression model analysis. Univariate regression models are used as follows:

$$SR_{it} = \alpha_0 + \beta PAT_{it} + \varepsilon_{it} \dots \dots \dots (1)$$

$$SR_{it} = a_0 + \beta EPS_{it} + \varepsilon_{it} \dots \dots \dots (2)$$

$$SR_{it} = a_0 + \beta ROA_{it} + \varepsilon_{it} \dots \dots \dots (3)$$

$$SR_{it} = a_0 + \beta ROE_{it} + \varepsilon_{it} \dots \dots \dots (4)$$

$$SR_{it} = a_0 + \beta ROI_{it} + \varepsilon_{it} \dots \dots \dots (5)$$

$$SR_{it} = a_0 + \beta EVA_{it} + \varepsilon_{it} \dots \dots \dots (6)$$

where SR_{it} is stock returns for firm (i) in the period (t), α_0 is alpha (constant), β is beta (slope), PAT_{it} is profit after tax for firm (i) in the period (t), EPS_{it} is earnings per share for firm (i) in the period (t), ROA_{it} is return on assets for firm (i) in the period (t), ROE_{it} is return on equity for firm (i) in the period (t), ROI_{it} is return on investment for firm (i) in the period (t), EVA_{it} is economic value added for firm (i) in the period (t), ε_{it} is error term for firm (i) in the period (t) and $i = 1, \dots, 534$ and $t = 1, \dots, 19$.

To test H3, multiple regression analysis is used by the incremental information content of independent variables (PAT, EPS, ROA, ROE and ROI) on the dependent variable (stock returns).

$$SR_{it} = \alpha_0 + \beta_1 PAT_{it} + \beta_2 EPS_{it} + \beta_3 ROA_{it} + \beta_4 ROE_{it} + \beta_5 ROI_{it} + \varepsilon_{it} \dots \dots \dots (7)$$

$$SR_{it} = \alpha_0 + \beta_1 PAT_{it} + \beta_2 EPS_{it} + \beta_3 ROA_{it} + \beta_4 ROE_{it} + \beta_5 ROI_{it} + \beta_6 EVA_{it} + \varepsilon_{it} (8)$$

where SR_{it} is stock returns for firm (i) in the period (t), α_0 is alpha (constant), β is beta (slope), PAT_{it} is profit after tax for firm (i) in the period (t), EPS_{it} is earnings per share for firm (i) in the period (t), ROA_{it} is return on assets for firm (i) in the period (t), ROE_{it} is return on equity for firm (i) in the period (t), ROI_{it} is return on investment for firm (i) in the period (t), EVA_{it} is economic value added for firm (i) in the period (t), ε_{it} is error term for firm (i) in the period (t) and $i = 1, \dots, 534$ and $t = 1, \dots, 19$.

5. Results and analysis

5.1 Descriptive statistics and correlation matrix

In Table 1 and 2, we report the results of heteroskedasticity, fixed effect and random effect, and stationarity in panel data regression models for the period of 2000–2018, respectively. Part 1 of Table 3 depicts descriptive statistics and the correlation of dependent variable (stock returns) and six sample independent variables. It is evident from the table all the research variables have a positive mean value, which is considered in this study. In addition, average stock returns of all companies is 46.01 whereas the mean value of PAT is 201.30, indicating that the majority of Indian manufacturing companies in this study are able to get higher return than cost of capital. One significant observation that can be drawn from the table is

Tests description		Model 1	Model 2	Model 3	Model 4	Model 5
Heteroskedasticity						
Breusch–Pagan–Godfrey (BPG) test	obs* R^2	1.892	0.911	3.460	1.704	0.387
	p -value	0.169	0.340	0.063	0.192	0.534
Fixed/random effect test						
Hausman's test	Chi-square statistic	50.891	171.900	55.712	182.951	40.934
	p -value	0.000	0.000	0.000	0.000	0.000

Note(s): ** Significant level at 0.05

Table 1. Results of different tests for best fit pooled regression models

Financial performance measures	Levin, Lin and Chu	Im, Pesaran and Shin W -stat	Augmented Dickey Fuller–Fisher chi- square	Results
PAT	-26.252 (0.000)**	-20.657 (0.000)**	2341.900 (0.000)**	Stationary
EPS	-21.383 (0.000)**	-21.780 (0.000)**	2414.310 (0.000)**	Stationary
ROA	-27.589 (0.000)**	-26.487 (0.000)**	2747.380 (0.000)**	Stationary
ROE	-25.662 (0.000)**	-23.065 (0.000)**	2474.920 (0.000)**	Stationary
ROI	-25.208 (0.000)**	-24.860 (0.000)**	2613.390 (0.000)**	Stationary
EVA	-21.818 (0.000)**	-19.127 (0.000)**	2265.680 (0.000)**	Stationary

Note(s): **Significant level at 0.05; PAT: profit after tax; EPS: earnings per share; ROA: return on assets; ROE: return on equity; ROI: return on investment and EVA: economic value added

Table 2. Results of panel unit root test

Values in parentheses are p -values

	Stock returns	PAT	EPS	ROA	ROE	ROI	EVA
<i>Part 1: descriptive statistics</i>							
Mean	46.01	201.30	14.23	3.86	2.53	5.18	283.97
SD	167.13	1145.33	62.91	10.89	9.02	24.12	1529.0
Minimum	-100.00	-11906.23	-400.93	-236.84	-38.00	-875.50	-10101.56
Maximum	11632.82	33612.00	3936.63	66.91	583.47	174.05	38172.60
<i>Part 2: correlation matrix</i>							
PAT	0.370**	1					
EPS	0.488**	0.595**	1				
ROA	0.291**	0.456**	0.346**	1			
ROE	0.472**	0.582**	0.386**	0.567**	1		
ROI	0.290**	0.457**	0.635**	0.470**	0.559**	1	
EVA	0.372**	0.381**	0.460**	0.242**	0.512**	0.243**	1
Stock returns	1	0.370**	0.488**	0.291**	0.472**	0.290**	0.372**

Note(s): In descriptive statistics, PAT and EVA numerals are in Rs (INR) crore; EPS numeral is in Rs (INR) per share; ROA, ROE, ROI and stock returns are in percentages. PAT: profit after tax; EPS: earnings per share; ROA: return on assets; ROE: return on equity and ROI: return on investment**. Correlation is significant at the 0.01 level (two-tailed)

Table 3.
Descriptive statistics

that most of sample Indian companies are adding value to shareholders' wealth with 1529.0 mean value. According to this table, EVA has the largest mean value followed by PAT, stock returns, EPS, ROI, ROA and ROE. Table further reveals that EVA (1529.0), PAT (1145.33) and stock returns (167.13) have highest standard deviation values in sample variables. ROE, ROA, ROI and EPS reveal the lowest standard deviation.

In Part 2 of Table 3, we report the results of pair-wise correlation between sample variables that considered in this study. We notice that all sample variables are positively associated with each other. A stock return is extremely correlated with EPS (0.488) with significant value at 1%. Further, ROE (0.472) has the highest correlation with stock returns whereas EVA, PAT, ROA and ROI are observed with lower correlation. One significant observation that can be drawn from table that traditional performance measures as EPS and ROE outperform EVA among financial performance metric. On the first hand, based on correlation analysis, we observed that the traditional financial performance measures are more correlated with stock returns.

5.2 Results of regression statistics for relative information content test

Table 4 shows the results for every independent variable's relative information content tests using R^2 , adjusted R^2 , F -statistics, p -value, Akaike information criterion (AIC) and Durbin-

Regression model	R^2	Adjusted R^2	F -statistics	p -value	AIC	Durbin-Watson
1. PAT	0.526	0.498	18.827	0.000	1.529	1.408
2. EPS	0.550	0.523	20.779	0.000	1.476	1.487
3. ROA	0.534	0.507	19.509	0.000	1.510	1.446
4. ROE	0.536	0.509	19.662	0.000	1.506	1.442
5. ROI	0.535	0.507	19.532	0.000	1.509	1.442
6. EVA	0.528	0.500	19.032	0.000	1.523	1.411

Note(s): Significant at 5% level; PAT: profit after tax; EPS: earnings per share; ROA: return on assets; ROE: return on equity; ROI: return on investment and EVA: economic value added

Table 4.
Regression statistics for relative information content of sample independent variables

Watson values. The evaluation is made by performing six simple regressions for each performance measure (PAT, EPS, ROA, ROE and ROI). The table compared the R^2 of six separate regressions, one for each performance measures. We find that there is a significant difference between the six regression models of relative information content. It is observed that all equations are significant according to F -statistics at the 0.05 level. In the same way, the coefficient values of all six explanatory variables are statistically significant at the level of 0.05. We find that EPS have greatest ability to explain shareholder returns of Indian manufacturing companies with R^2 of 55%. Next, ROE has significantly larger R^2 (53.6%) followed by ROA, EVA and PAT. One significant observation that can be drawn from the table is that traditional performance measures dominate over value-based performance measures while explaining the variations in shareholders' return of Indian manufacturing companies. EVA ranks fourth in terms of explanatory power of the independent variables by R^2 of 52.8%. So, empirical results of the study do not confirm the claim of EVA is superior to traditional performance measures (PAT, EPS, ROA, ROE and RO) in the perspective of relative information content. Our model is consistent with the results of various international studies (Chen & Dodd, 1997; Biddle, Bowen, & Wallace, 1997; Bao & Bao, 1998; Worthington & West, 2001; De Wet, 2005; Ismail, 2006; Kim, 2006; Irala, 2005; Kyriazis & Anastassis, 2007; Erasmus, 2008a, b; Maditinos, Sevic, & Theriou, 2009; Kumar & Sharma, 2011a, 2011b; Altaf, 2016). We conclude that traditional performance measures (EPS and ROE) have great ability to explain the variations in stock returns of Indian manufacturing companies.

5.3 Results of regression statistics for incremental information content test

With the purpose of find out incremental information content of EVA, we used two regression models (model 7 and 8) with sample variables. Regression model 7 used only earnings-based measures in its equation. Modern metric EVA only appeared in regression model 8. According to F -statistics, regression model 7 and 8 are statistically significant at the level of 5%.

It is evident from Table 5 that the mutually combination of sample traditional accounting measures (model 7) revealed that R^2 is 55.9% with a statistically significant p-value (0.000). Thus, our third hypothesis (H3) indicated that the incremental information content of sample accounting-based variables adds marginal explanatory power in explaining stock returns performance of firm. The statistic for the regression model 8 (including EVA along with

Independent variables	Model 7	VIF	Model 8	VIF
PAT	-0.390 (-12.376)	2.589	-0.597 (-17.302)	2.352
EPS	0.251 (13.259)	3.108	0.228 (12.116)	2.135
ROA	-0.197 (-3.356)	3.425	-0.168 (-2.880)	1.987
ROE	0.467 (12.693)	4.365	0.546 (14.814)	1.568
ROI	0.150 (2.688)	4.552	0.168 (3.043)	2.223
EVA	-	-	0.216 (14.018)	2.568
R^2	0.559	-	0.568	-
Adjusted R^2	0.532	-	0.542	-
F -statistics	21.334	-	22.12	-
% change in R^2	-	-	0.90%	-
Hausman's test	298.528 (0.000)	-	250.478 (0.000)	-
Breusch-Pagan-Godfrey (BPG) test	5.556 (0.352)	-	7.275 (0.296)	-
Durbin-Watson	1.507	-	1.526	-

Note(s): Significant at 5% level; PAT: profit after tax; EPS: earnings per share; ROA: return on assets; ROE: return on equity; ROI: return on investment; EVA: economic value added and VIF: variance inflation factor

Table 5.
Multiple regression
statistics for
incremental
information content of
various traditional
performance measures

traditional measures) carrying R^2 56.8%, which explained that EVA adds marginally 0.90% information content in explaining stock returns of the firm in Indian manufacturing companies. It can be concluded that EVA along with other performance measures can explain stock return performance of Indian companies. Nevertheless, EVA is not a better performance measure than traditional measures due to scant explanatory power in elucidating variation in the stock returns performance, which is opposed by [Stewart \(1991\)](#), [Belkaoui and Fekrat \(1994\)](#), [Milunovich and Tsuei \(1996\)](#), [Banerjee \(1999\)](#), [Kleiman \(1990\)](#) and [Sikarwar and Gupta \(2016\)](#).

6. Summary and conclusion

As the commencement of this article, we examined the correlation between the dependent variable (stock returns) and independent variables (PAT, EPS, ROE, ROA, ROI and EVA) of BSE-listed companies using a dataset of 534 Indian manufacturing companies for the period 2000–2018. The present study investigated the information content of five accounting-based performance measures and EVA in explaining the stock returns of sample companies. The results using relative and incremental information content tests indicated that the relative information content of EPS and ROE out of various sample measures outperforms that of EVA, so we reject the hypothesis that EVA has better explanatory power than traditional performance measures. Further, the incremental information content results revealed that EVA is not superior to accounting-based measures and had no significant impact on variations in the stock return performance of the Indian manufacturing companies. The empirical results of this study do not support the claim advocates by various studies as [Stewart \(1991\)](#), [Worthington and West \(2004\)](#), [Grant \(2003\)](#), [Lee and Kim \(2009\)](#), [Bao and Bao \(1998\)](#), [Lehn and Makhija \(1996\)](#), [Uyemura *et al.* \(1996\)](#), [O'Byrne \(1996\)](#), [Sikarwar and Gupta \(2016\)](#), [Athanasakos \(2007\)](#) and [Machuga, Pfeiffer and Verma \(2002\)](#) that EVA is a better indicator than traditional performance measures. However, we find evidence following the work of assorted studies ([Fayed & Dubey, 2016](#); [Ramana, 2007](#); [Arabsalehi & Mahmoodi, 2012](#); [Erasmus, 2008a, b](#); [Kim, 2006](#); [Chen & Dodd, 2001](#); [Biddle *et al.*, 1997](#); [De Wet, 2005](#); [Kramer & Pushner, 1997](#); [De Villiers & Auret, 1997](#); [Ismail, 2006](#); [Kumar & Sharma, 2011a, 2011b](#); [Alipour & Pejman, 2015](#)).

The practical contribution of the current study is to design the multicriteria performance measurement system by incorporating a combination of these measures. [Biddle *et al.* \(1998\)](#) found that EVA components estimated by Stern Stewart add marginally to the information content in accruals and cash flows, making them economically insignificant. [Kaur and Narang \(2009\)](#) found that only 37 out of 500 Indian firms provided EVA reports in annual reports. [Tripathi, Kashiramka, and Jain \(2018\)](#) revealed that computation complexities and the unaudited nature of EVA are the reason for the nondisclosure of EVA in corporate financial statements in Indian firms. The EVA disclosure in Indian financial reporting is not mandatory, as well as computation difficulties of EVA are the main reasons for most Indian companies still depend on conventional measures. Thus, the Indian corporate sector will be benefited from this study in deciding their best financial performance measures and making financial control effective. The study found that accounting-based measures, such as EPS, ROA and ROE, positively affect stock returns.

Moreover, these measures have more explanatory power than EVA. Traditional measures such as EPS, PAT, ROA, ROI and equity are their businesses' significant financial performance measures. So, we conclude that Indian companies can continue to evaluate their performance based on traditional accounting-based financial performance measures.

The study is helpful for society in numerous ways. The findings are important for indirect users of the financial information like government, management, corporate managers, board of directors, employees and creditors. These stakeholders judge the company's financial

performance for different reasons based on information provided by these measures. The study is also expected to be of immense interest and use for students, academicians and researchers as it would open new vistas for further research in management accounting.

It is recommended that using alternative dependent variables such as MVA with the same or a larger data set of similar or greater time span. Many international studies (Altaf, 2016; Kumar & Sharma, 2011a, b; Ross, 1998; Ferguson *et al.*, 2006; Kumar, 2013) have used MVA instead of stock returns to observe the explanatory power of different financial performance measures. All in all, our study's results do not support the claim that superiority of EVA and a better explanatory performance measure than traditional accounting-based measures in explaining stock returns performance of the firm. The study findings can have the following implications:

Managers can improve the internal performance and increase shareholder wealth of company with the help of measures that introduced and identified by the present study.

There is a little association between EVA and stock returns performance of Indian manufacturing companies listed in BSE, so investors cannot think about EVA along with earnings-based measures in their investment decisions and give minor importance in their decision making.

Researchers who test the information content of cost of capital, adjusted NOPAT, operating cash flows and residual income should evaluate these measures' association with stock returns to find out the explanatory power of these measures. Other studies can examine the value relevance of banking institutions and service sector and create association with the results of other industries.

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