

Shareholder value creation of eva and traditional accounting measures – evidence from india

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Abstract

In an era marked by globalization and rapid technological advancements, companies are striving to maintain relevance and sustainability in the market by exploring diverse business opportunities and implementing effective strategies. This study aims to investigate the value relevance of Economic Value Added (EVA) and Traditional Accounting Variables such as Earnings Per Share (EPS), Return on Assets (ROA), Return on Equity (ROE), and Profit After Tax (PAT) on Market Value Added (MVA). Focusing on manufacturing firms in the NIFTY Midcap 100 index from 2008-09 to 2019-20, the study employs panel data regression analysis based on the Easton and Harris Model (1991) and utilizes Gretl software for statistical analysis. The study uses panel data regression analysis to examine how EVA, Traditional Accounting Variables, and MVA relate, using financial data from 49 manufacturing firms in the NIFTY Midcap 100 over ten years. The Easton and Harris Model serves as the theoretical framework for the analysis, and Gretl software is utilized for statistical computations and modelling. The findings of this study shed light on the value relevance of EVA and Traditional Accounting Variables in explaining changes in MVA, serving as a measure of shareholder value. The study aims to provide insights into which metrics demonstrate a stronger correlation with MVA, thus offering valuable implications for shareholders, investors, and corporate decision-makers. The practical implications of this study extend to shareholders, investors, and corporate management. By understanding the value relevance of different performance metrics, stakeholders can make informed decisions regarding investment, strategic planning, and resource allocation. Moreover, this study contributes to the ongoing discourse on value-based management and its impact on shareholder value creation in the manufacturing sector. This study contributes to the existing literature by focusing on the value relevance of EVA and Traditional Accounting Variables specifically in the context of manufacturing companies within the NIFTY Midcap 100 index. The utilization of panel data

regression analysis and the Easton and Harris Model adds methodological rigor and originality to the research, offering valuable insights for both academia and industry practitioners.

Keywords: Shareholder Value Creation, Market Performance, Economic Value Added, Market Value Added, Easton and Harris Model

1. Introduction

As posited by financial management theorists and experts, the fundamental motto of corporate finance is maximizing the intrinsic value of the firm, in turn the wealth of the shareholders. The maximization of shareholders' wealth can be assessed in terms of return on their investments in the form of capital appreciation or dividends. In today's capital markets, investors assess a firm based on both financial reports and market performance as signalled in share prices. In this context, whether the measures of financial and economic performance like profits, Return on Assets, Earnings per Share etc. really assess the true value of the company? If so, does these measures capable enough to reflect the measures of market performance? The answer to this is being pondered by many as to which is the reliable and effective measure that connotes the intrinsic value of a firm? Does that measure highly reliable in facilitating investment decisions to identify over-priced or under-priced shares or will that help the management in assessing the performance of their employees or will that be good enough to evaluate the credit risk and help lenders gauge the security of their loans? (Lee, 1996). A new concept known as Value based Management has thrown some light in culling out the true economic value added by a firm and whether the investors' fund is being productively utilized by a firm in the longer run. The value-based measures complement the traditional accounting measures of financial performance in identifying the value creating stocks.

Value Based Management (VBM) has been in the limelight of corporate finance which helps managers in ascertaining the strategies congruent to achieve goals in the most effective way. The concept evolved during 1990's which integrates the firm's strategy with the value it creates in the capital market. The term "Value based Management" was postulated by Taggart et al. (1994) which speaks of value drivers like corporate governance, performance management, strategic planning etc. integrated towards shareholder value creation. Companies adopting value-based management (VBM) principles generally achieve better results than those that do not as revealed by the study conducted by Athanassakos, 2007. The value-based management perspective suggests that understanding value drivers should influence not just internal actions and control systems but also external disclosure requirements, aligning with calls in financial accounting for more comprehensive information on key value drivers (Ittner and Larcker, 2001).

Shareholder Value

Shareholder value has become a prominent word in corporate finance. Financial theorists all over the world are looking for a definite measure of performance that may serve as a standard for determining the genuine value delivered by a company for its shareholders. Many financial management theorists believe that popular value-added measures, such as Market Value Added (MVA), represent the true appreciation of shareholders' wealth (Shotter, Dennis, Brummer, and Boshoff (1998), Fernandez, 2002, Fiordelisi & Molyneux, 2004, Vijayakumar, 2008, Munteanu & Brezeanu, 2012, Hall, 2018). The primary goal of corporate finance is to maximise shareholder

value or (wealth). While the traditional focus of corporate finance has been on maximizing shareholder wealth, there's a growing acknowledgment of the benefits of adopting a stakeholder-oriented approach. This approach involves considering the interests of all stakeholders, not just shareholders, in decision-making processes. By aligning the interests of shareholders with those of other stakeholders, companies can foster long-term financial success through factors such as innovation, reputation enhancement, and risk mitigation. Therefore, while shareholder wealth maximization remains significant, there's increasing recognition of the importance of balancing shareholder interests with those of stakeholders to achieve sustainable value creation.

Market Value Added

MVA represents a company's future growth prospects. It is a long-term indicator of market performance. It displays a company's potential growth opportunities. MVA is calculated by subtracting the market value from the economic book value of the firm's total capital, equity, and debt. It is the difference between the firm's market value and its invested capital. It depicts a firm's future market worth, in the sense that it represents the present value of a company's future economic profits (Vijayakumar, 2008). MVA indicates the real worth of a company's investments. It evaluates the efficiency of capital employed and predicts successful endeavours for a company. The MVA of a company is the difference between its market and book value.

$$MVA = \text{Market value of a Firm} - \text{Capital employed by Firm}$$

Performance Measures for Shareholder Value Creation

Enterprises worldwide undergo continuous evaluations based on performance metrics such as EPS (Earnings per Share), ROA (Return on Assets), ROE (Return on Equity), PAT (Profit After Tax), and more. There were studies that investigated into the relationship between performance measures and shareholder value. Nonetheless, there is insufficient data to demonstrate that a single indicator can be employed to predict changes in shareholder value. Furthermore, these performance indicators are derived from accounting-based data, which is deemed to be distorted and so inefficient in reflecting the true performance of the companies. Many researchers have ventured into the realm of investigating true measurements of performance in order to overcome the ineffectiveness of traditional metrics. The majority of research undertaken in developed markets validated the superiority of Economic Value Added (EVA), a superior measure of performance that may explain shareholder value. (Lehn and Makhija, 1997, Worthington and West, 2004, Feltham et al., 2004). Economic Value Added (EVA), a prominent value-based metric created by US Consulting firm Stern Stewart & Co. in the 1980s has been viewed as a true appraisal of a corporation's economic performance.

Economic Value Added

Economic Value Added is one of the Value Based Management indicators that indicates a firm's real economic performance. As posited by (Young & O'Byrne, 2003), EVA can be linked to the value drivers of a firm which acts as the catalyst in the implementation of strategies by a firm. It denotes the economic profit, the residual profits of a firm arrived after deducting a capital charge from the Net Operating Profits After Tax (NOPAT) of a firm. The opportunity cost of capital, also known as the Weighted Average Cost of Capital (WACC), is critical in determining economic

profit. If a company can obtain a return on invested capital that exceeds the WACC, it has created value for its shareholders. As a result, a positive EVA indicates the creation of value. On the other hand, negative value of EVA denotes destruction of value. Negative EVA would indeed signify a decrease or destruction of value rather than its creation or enhancement. Economic Value Added (EVA) serves as a performance indicator for firms over a specific timeframe. Contrary to misconceptions, firms with negative EVA should not be automatically dismissed as lacking future prospects (Pettit, 2001). Metrics such as EVA provide a means to accurately assess economic profit and serve as benchmarks for manager compensation based on performance. By integrating value-based measures like EVA into performance evaluations, companies can foster employee improvement. This improvement stems from aligning business strategies towards long-term value creation. Compensating managers based on accounting earnings will have misleading outcomes as it "...may take actions that increase earnings but destroy value, or fail to take actions that may reduce earnings but create value" (Young, 1999). On the flip side, Biddle et al., 1997 has opined that "for some firms EVA may be an effective tool for internal decision making, performance measurement, and incentive compensation, it does not dominate earnings in its association with stock market returns". Thus, it makes sense to evaluate a company based on both traditional as well as sophisticated measures of performance like EVA which will be able to reflect shareholder value in a better manner. Shareholder value can be assessed from value based metric like MVA of a company. There is an impending need to know the relevance of value metrics like EVA in conjunction with the conventional accounting-based performance measures like EPS, ROA, ROE, PAT in predicting the indicator of shareholder value like MVA in the Indian context. India's rapid economic growth provides an ideal setting to assess the effectiveness of value metrics like EVA alongside conventional accounting-based performance measures. The diverse market dynamics in India offer valuable insights into how different companies perform and how various performance metrics relate to shareholder value. As an emerging market, India faces unique challenges such as regulatory uncertainties and infrastructure limitations, making it crucial to evaluate the efficacy of value metrics in overcoming these obstacles. The increasing investor participation in India's capital markets necessitates sophisticated measures beyond traditional accounting metrics for evaluating company performance and potential, highlighting the relevance of exploring value-based metrics in this context. Particularly, this study addresses a crucial aspect of corporate finance: the creation of shareholder value and the effectiveness of financial performance metrics such as Economic Value Added (EVA), Market Value Added (MVA), EPS, ROA, and ROE in accurately reflecting a company's true worth. Its significance lies in bridging the gap between traditional accounting measures and value-based metrics, particularly within the dynamic context of India's rapidly growing economy and diverse market dynamics. By evaluating the relevance and utility of metrics like EVA alongside conventional measures in predicting shareholder value, specifically through MVA, this research aims to provide a comprehensive understanding of how different performance indicators contribute to shareholder wealth in the Indian business landscape. This study stands out by delving into the intricate connection between value-based and conventional performance metrics, providing insights into how they differ in evaluating company performance and potential. The study's motivation stems from the need to fill existing gaps in understanding how these metrics align with shareholder interests, especially in the context of India's evolving market complexities. Through

rigorous analysis using panel data analysis, the study aims to measure and compare the impact of various financial performance measures on key indicators of shareholder value, thus contributing to a more comprehensive understanding of value creation strategies in corporate finance.

2. Literature Review

Over the last few decades, the concept of shareholder value has been intensely debated. There appears to be a disorientation between the management's perspective of shareholder orientation and its implementation in the shareholder value concept. The justification of shareholder value orientation by the management is indeed a topic of relevant research (Follert, Klingelhöfer & Daumann, 2023). "Shareholder Value Creation" is dynamic in the field of corporate finance and has evolved over the past few decades as an important goal of businesses in the longer run. Managing businesses effectively amidst tremendous competition and satisfying the stakeholders by earning returns over their expectations is a quintessential task for corporates all over the world. Volatility in capital markets and rapid economic disruptions in today's world has increased the complexity about decision making for investors. It is imminent for the investors to know whether companies are productively employing and contributing true returns on their investments which are above the opportunistic cost of capital. This exploration leads to finding out the value relevance of performance measures and their significance in predicting shareholder value creation by various contemporary researches conducted by financial economists around the world. The discussion surrounding shareholder value creation has evolved significantly over the years, with debates focusing on the alignment of management's perspective on shareholder orientation with the practical implementation of shareholder value concepts. This ongoing discourse underscores the need for robust frameworks like value-based management (VBM) to effectively navigate the complexities of corporate finance and maximize shareholder value. Research studies provide valuable insights into how VBM principles can enhance corporate performance and contribute to shareholder value creation, thereby reinforcing the importance of aligning corporate strategies with shareholder interests for long-term value maximization.

Ittner and Larcker's (2001) review of value-based management (VBM) frameworks and Athanassakos's (2007) study on the adoption of VBM among Canadian companies both contribute to the broader discussion on shareholder value creation. Ittner and Larcker's review highlights the importance of understanding value drivers and integrating financial and managerial accounting research to enhance internal actions and external disclosure requirements, all of which are central to maximizing shareholder value. Athanassakos's study further emphasizes this point by demonstrating the positive correlation between using Economic Value Added (EVA) and improved stock price performance, indicating that embracing VBM principles can lead to enhanced corporate performance and ultimately contribute to shareholder value creation. These insights collectively underscore the significance of VBM in aligning corporate strategies with shareholder interests and optimizing overall business performance for value creation.

The literature on shareholder value creation has evolved significantly, with Economic Value Added (EVA) emerging as a prominent metric in assessing managerial contributions to value. This shift reflects the ongoing debate about the efficacy of traditional accounting-based measures versus newer approaches like EVA in capturing true shareholder value. EVA's significance lies in its ability to capture managerial contributions to value more effectively than conventional metrics. Academic

investigations, employing rigorous models, underscore EVA's potential as an incentive contracting tool, with its correlation to stock returns serving as a reliable indicator of its value. The study by Gupta and Sikarwar (2016) compared Economic Value Added (EVA) with traditional accounting performance measures like earnings per share (EPS), return on assets (ROA), and return on equity (ROE) across 50 Indian companies from the Nifty 50 index during 2008-2011. Using panel regression models, it assessed their relative and incremental information content in relation to stock returns, finding that EVA provides more relevant and incremental insights into shareholder value creation compared to traditional metrics. It suggested further analysis across different industries and adjustments to EVA calculations. This approach, linking stock returns with financial measures, adds a novel dimension to existing research in this field.

The evolving discourse on shareholder value creation, marked by the adoption of metrics like Economic Value Added (EVA), reflects a shift towards more nuanced and effective ways of assessing managerial contributions to value. Empirical evidence further supports the adoption of EVA by firms seeking to optimize internal performance measurement and align managerial incentives with shareholder wealth creation (Garvey and Milbourn, 2000). The exploration of Economic Value Added (EVA) as a significant metric for assessing managerial contributions to value and its adoption by firms aligning with shareholder wealth creation sets the stage for understanding how specific firm characteristics influence shareholder value indicators, as demonstrated by Nieuwoudt and Hall (2022) and Johan (2018). Nieuwoudt and Hall (2022) examined the firm-specific characteristics that had a substantial impact on the indicators of shareholder value. The main aim was to determine whether there exists a difference in firm specific attributes in reflecting shareholder value as measured by value based measures like EVA, MVA vs. traditional accounting based measure like EPS. Multiple regression analysis were performed to analyse the relationship using a sample of 35 JSE listed firms from 2000 to 2018. The findings revealed large firms with attributes of high profitability, efficient asset management and low systematic risk to have created shareholder value. In case of MVA, firms exhibiting lower liquidity ratios with less investments in R&D seem to have added more value to shareholder's wealth. EPS as a measure of shareholder value showed contrasting results. Those firms with high risk profile and lower profitability were able to contribute better to shareholder's wealth. Johan (2018) investigated the link between EVA, MVA, and Return on Weighted Average Cost of Capital to assess the holding company, PT's, investment outcomes. Over an eight-year period from 2009 to 2016, the financial performance of Astra International, Tbk's subsidiary companies was compared to the holding company's cost of capital. EVA had a consistent measurement with the comparison of subsidiary's ROE (Return on Equity) with holding company's Weighted Average Cost of Capital. Furthermore, negative MVA did not necessarily reflect negative EVA or the difference between ROE and negative WACC. Apart from EVA, the market valued the company based on a variety of other factors.

The studies by Gounder and Venkateshwarlu (2017) in the Indian banking sector and Hall (2016) in the South African enterprise landscape collectively underscore the ongoing exploration of performance metrics like Economic Value Added (EVA) and Market Value Added (MVA) in understanding and enhancing shareholder value creation. While Gounder and Venkateshwarlu (2017) focus on the relative importance of EVA in predicting shareholder value in Indian banks compared to traditional indicators, Hall (2016) delves into industry-specific value drivers and their

impact on MVA and market-adjusted returns across diverse sectors. These studies provide valuable insights into the nuanced relationship between performance measures and shareholder value across different business contexts. The study performed by Gounder and Venkateshwarlu (2017) in the Indian banking sector, compared conventional accounting-based measures with modern performance metrics like Economic Value Added (EVA) in predicting shareholder value as measured by Market Value Added (MVA). Their research, encompassing public and private sector banks, revealed a significant relationship between EVA and MVA across all banks, with DPS showing a stronger association with MVA in private sector banks. Hall's (2016) examined industry-specific value drivers in South African enterprises, particularly focusing on MVA and market adjusted returns as indicators of shareholder value creation. This study, spanning various sectors such as construction, food and beverages, manufacturing, retail, and technology, analyzed the impact of economic and accounting-based value drivers on shareholder value over a ten-year period. The findings emphasized the importance of using MVA as the primary measure for evaluating enterprises segmented by specific sectors, with accounting variables demonstrating a stronger influence on dependent variables compared to economic variables like EVA. These results align with the broader discussion on the relevance of different performance metrics in assessing shareholder value across diverse industries. Oana's (2014) examination of EVA's ability to reflect MVA in Finnish companies provides a valuable perspective on the effectiveness of Economic Value Added as a performance measure. While the study acknowledges EVA's relevance in evaluating company performance, it also indicates that EVA might not be the most superior measure, aligning with the ongoing debate about the efficacy of different metrics in capturing shareholder value. This discussion resonates with the broader exploration of performance measures like EVA and MVA across different industries, contributing to a nuanced understanding of shareholder value creation metrics.

The evaluation of Economic Value Added (EVA) in relation to shareholder value creation has been a subject of rigorous examination across various business environments. In the Portuguese business context, da Cunha Pinto and Machado-Santos (2011) delved into the correlation between EVA and Market Value Added (MVA), highlighting EVA's superior explanatory power despite occasional discrepancies between profit indicators and EVA. EVA® was tested for its value relevance in explaining EMV and MVA compared to Net income and Operating profit. Even though, the Group had recorded positive profit and net income during the study period, the negative EVA for the years 2006 and 2008 verified their inability to shareholder value creation. The results pointed out that EVA indeed had a greater explanatory power and information content in reflecting EMV and MVA. Similarly, Kumar and Sharma (2011) explored EVA's relevance in Indian manufacturing, contrasting it with traditional metrics like NOPAT and Operating Cash Flow (OCF), echoing findings that underscore the continued importance of conventional measures in understanding Market Value Added dynamics. The value relevance of EVA in reflecting MVA was evaluated using relative and incremental information content analysis in comparison to NOPAT, Operating cash flow, EPS, ROCE, and ROE. The sample consisted of 76 manufacturing firms listed in BSE, chosen from the list of most valuable companies as ranked by market capitalisation in BT-500 companies. The results of regression analysis portrayed EVA to have a low relative information content as compared to NOPAT and OCF. Likewise, the incremental

information content tests revealed EVA to explain market value to a marginal extent. It emphasised the importance of traditional metrics in explaining the variation in MVA. The findings supporting the better explanatory power of traditional measures were consistent with prior research on US capital markets undertaken by Chen and Dodd (2001) and Ismail (2006). Further, the study results were similar to that of Kyriazis and Anastassis (2007) which pronounced greater association between traditional measures such as net income and operating income exhibiting a significant impact on a company's market value. These studies reflect a broader discourse on the efficacy of EVA in explaining shareholder wealth and its comparison with alternative performance indicators like Total Shareholder Return (TSR) and Tobin's Q, as investigated by Elali (2006). The study used the statistical models of Biddle et al. (1997), Chen and Dodd (1997), and Kramer and Pushner (1997) to investigate the worth of EVA and its components - PS, TIC, and Lagged EVA - in explaining MVA, as an indicator for Shareholder wealth, in comparison to TSR and Tobin's Q. Panel data of 13000 firm-year observations were taken from the database - 2002 US EVA/MVA Yearly 1000 Index from Stern Stewart Excel file ranging from 1990 to 2002. Multivariate regression models were designed to study the relative and incremental value relevance of EVA over TSR and Tobin's Q in predicting variation in MVA. The results showed that the correlation coefficients between MVA and EVA were considerable, demonstrating EVA's information effectiveness. In predicting MVA, the pairwise combination of each component of EVA, as well as TSR and Tobin's Q, exhibited considerable incremental value relevance. Overall, the research findings effectively supported EVA advocates' claims that it outperformed other performance measures in explaining shareholder wealth, and were broadly comparable to prior studies suggesting the information usefulness of EVA, such as Worthington and West (2004), Feltham et al. (2004), Grant (2003), Bao and Bao (1998), Lehn and Makhija (1997) and O'Byrne (1996).

The endorsement of Economic Value Added (EVA) as a superior metric for evaluating shareholder wealth aligns with its inception by Stewart (1991) as a comprehensive tool considering cost of capital. Further investigations, such as those by Lee and Kim (2009), reinforce EVA's effectiveness across diverse industries like hospitality, where it emerges alongside Market Value Added (MVA) and refined EVA (REVA) as a robust measure for predicting market-adjusted returns and assessing overall performance.

The search for a reliable metric that accurately reflects market performance and guides strategic decisions for both company management and investors was evidenced by the research performed by De Wet (2005) who revisited the claim of Stern Stewart proclaiming EVA as a superior performance measure which was refuted by many studies that demonstrated results suggesting traditional measures as better drivers of shareholder value. The study focused on identifying the drivers of value which had a strongest impact on MVA that would in turn guide companies in developing strategies for optimizing value creation for their shareholders. The study sample consisted of 89 industrial companies listed in JSE securities exchange in South Africa during 1995 to 2004. MVA was the external performance measure which was regressed on a year-on-year basis by each of the internal measures of performance like the Spread (Standardised EVA), Cash flow from operations, ROA, ROE, EPS and DPS. The regression results proved EVA to have a less explanatory power on MVA with a R-squared value of 8%. Rather, cash flow from operations had

a greater impact on MVA with a R-squared value of 38%. Likewise, ROA had a better impact on MVA with a R-squared value of 15%. Both EPS and DPS were insignificant in explaining MVA questioning the credibility of earnings and dividends as a base for share valuations in the case of South African listed companies. There were studies portraying significant linkages between EVA and MVA, alignment between a firm's internal value creation and company's market performance. At the same time, few studies had contrasting results to reveal empirically that EVA doesn't reflect shareholder value as measured by MVA. Thus, the results have been inconsistent and there is no conclusive evidence as to which measure is the real indicator of shareholder value. There exists an imminent need for a specific measure that can be used by the company's management to make strategic decisions or help investors to make informed decisions. In which case, is there a reliable measure that connotes the market performance accurately? Further, can that be applied as a benchmark by all the stakeholders to base their decisions?

This study attempted to answer these concerns by including both economic performance metrics such as EVA and traditional accounting-based measures as independent variables. Furthermore, MVA is used as the dependent variable that represents a company's market performance. It is proposed that establishing a unique measure of value creation can contribute to the existing literature by assisting the management, financial analysts, investors to optimize their decisions regarding real value creation and as a benchmark for assessing real performance of companies.

3. Development of Hypotheses

In the backdrop of competitive global markets characterised by volatility, uncertainty, complex and ambiguous nature, there is an imminent need to find out better ways of predicting the future prospects of investments and making informed decisions. In this light, companies too have to gauge their steps in order to satisfy their shareholders and gain their confidence in the longer run. There is a pertinent need for a unique measure that truly reflects shareholder value creation. In spite of the availability of plethora of choices at the disposal of management, there is no single measure to act as benchmark of shareholder value that can reflect value creation of companies belonging to any industry. Further, it is worth pondering whether a company is actually creating value to the shareholder's wealth or is the wealth being productively used? This study attempts to explore whether traditional accounting based performance measures or economic based measure like EVA is dominant in explaining shareholder value of companies. If so, is there a relationship between Economic Value Added (EVA) and traditional performance measures on the indicator of shareholder value. To be more precise, the assessment of value relevance of economic and accounting based measures of performance in reflecting the shareholder value is essential in order to know if the companies are really achieving their long-term strategic objective of maximizing the value of the firm. Many of the previous studies undertaken by various researchers were ascertaining the superiority of value metrics like EVA in contrast with accounting-based performance measures and attempted to explain why it is an accurate measure of market value. Nevertheless, the concept of EVA as an economic performance measure to reflect MVA has been contested by many researchers, with varied findings. This study is focused on pondering into the adaptability and validity of both traditional accounting-based performance measures and EVA, economic measure of performance in reflecting MVA, a value based measure as an indicator of

shareholder value. In this context, the study focuses on addressing the research questions presented below.

1. What is the relative value relevance of EPS, ROA, ROE, PAT and EVA in determining MVA?
2. Is EVA more effective with greater information content than traditional accounting-based performance measures?
3. What is the extent of shareholder value created by manufacturing companies as indicated by EVA, MVA?

Based on these, the following hypotheses were formulated:

H1 There exists a significant value relevance with respect to EPS, ROA, ROE, PAT, EVA jointly at levels and change positions in predicting MVA.

H2 EVA has greater value relevance than accounting-based performance metrics such as EPS, ROA, ROE and PAT in predicting MVA as an indicator of shareholder value.

4. Objectives

The study's primary objective is to examine the value relevance of Economic Value Added and traditional (accounting-based) performance indicators in explaining Market Value Added of 49 manufacturing companies listed in NIFTY Midcap 100 index.

The secondary objectives are;

1. to study the relative value of EPS, ROA, ROE, PAT and EVA on MVA.
2. to assess the incremental information usefulness of EVA in contrast to accounting based performance metrics on MVA.
3. to study the intercompany performance on shareholder value creation using EVA, MVA.

5. Research Methodology

Financial information and daily-adjusted closing prices of manufacturing companies listed in NIFTY Midcap 100 for a period of 10 years from 2009-10 to 2018-19 were collected. The data was collected from Capitaline database, National Stock Exchange (NSE) and RBI website. Purposive sampling method was employed in selecting 49 manufacturing companies listed in NIFTY Midcap 100 as sample. Few manufacturing companies which were listed on the NSE and lacked the relevant financial data for the whole ten-year study period were not included in the sample. In terms of value addition, the manufacturing companies in this index were chosen because of their significant contribution to economic growth when compared to other knowledge-based industry verticals. Moreover, Manufacturing plays a pivotal role in value addition, job creation, and economic growth, making it a crucial sector to analyse. As of 2023, the manufacturing sector contributed approximately 15-17% of India's GDP and employed over 20% of the country's workforce. Additionally, manufacturing companies listed in the NIFTY Midcap 100 index often represent established firms with substantial market capitalization, further underlining their importance in the Indian market. For instance, in 2023, manufacturing companies within the NIFTY Midcap index collectively accounted for around 20-25% of the index's total market

capitalization. This data underscores the prominence of manufacturing within the NIFTY Midcap segment and justifies its consideration in assessing market performance and shareholder value in the Indian context.

Panel data analysis was performed using Gretl software. In order to assess the balanced panel data made up of firm data sets over a ten-year period, multi-variate regression models were developed. Both relative and incremental information content analysis were used to test the value relevance of performance measures in determining MVA. The relative information content makes it possible to pinpoint the predictor variable that best accounts for changes in the dependent variables. In multi-variate regression models, the incremental information content technique uses pairwise combinations of predictor variables to help determine the variables that add additional information content. In this study, the incremental value relevance of EVA in explaining changes in MVA was analysed in comparison to traditional accounting-based measures.

The research framework is primarily formulated based on Easton and Harris formal Valuation model (1991) in which the value relevance tests were performed to assess the relationship between stock return with earnings level variable and change in earnings. The primary aim of the study conducted by Easton and Harris (1991) was to assess the value relevance (explanatory power) of earnings divided by share price at the beginning of the stock return period on the stock return. The research employed three models namely, the levels model, the changes model, the combined model that incorporated both level and change perspectives. The univariate analysis proved that earning level variable (A_t/P_{t-1}) and the change in earnings ($\Delta A_t/P_{t-1}$) were associated with stock return. Likewise, the combined model incorporating both the level and change variables proved good in explaining stock return, adding more information content in terms of higher R-square values.

The models tested by Easton and Harris (1991) have been presented below:

The levels model: $R_{jt} = \alpha_{t0} + \alpha_{t1} A_{jt}/P_{jt-1} + \varepsilon^1_{jt}$

The change model: $R_{jt} = \varphi_{t0} + \varphi_{t1} \Delta A_{jt}/P_{jt-1} + \varepsilon^2_{jt}$

The combined model: $R_{jt} = \gamma_{t0} + \gamma_{t1} A_{jt}/P_{jt-1} + \gamma_{t2} \Delta A_{jt}/P_{jt-1} + \varepsilon^3_{jt}$

Where R_{jt} is the return on a share of firm j

A_{jt} - accounting earnings per share of firm j for period t

ΔA_{jt} is the earnings change from t-1 to t

P_{jt-1} is the price per share of firm j at time t-1.

Many researchers conducted similar studies following the model developed by Easton and Harris (1991) that tested the value relevance of traditional performance variables on stock market returns of different capital markets. In particular, the study conducted by Maditinos, Sevic, Chatzoglou and Theriou (2007) explored the relative as well as incremental information content of EPS, ROI, ROE in explaining stock market return. The study employed the models specified below.

Relative Information Content Approach:

Model (1): Return = $a_0 + a_1 \text{EPS}/P_{t-1} + a_2 \Delta \text{EPS}/P_{t-1} + u_1$

Model (2): Return = $b_0 + b_1 \text{ROI} + b_2 \Delta \text{ROI} + u_2$

Model (3): Return = $c_0 + c_1 \text{ROE} + c_2 \Delta \text{ROE} + u_3$

Incremental Information Content Approach:

Model (4): Return = $f_0 + a_1 \text{EPS}/P_{t-1} + a_2 \Delta \text{EPS}/P_{t-1} + b_1 \text{ROI} + b_2 \Delta \text{ROI} + u_{4t}$

Model (5): $\text{Return} = g_0 + a_1 \text{EPS}/P_{t-1} + a_2 \Delta \text{EPS}/P_{t-1} + c_1 \text{ROE} + c_2 \Delta \text{ROE} + u_{5t}$

Model (6): $\text{Return} = h_0 + b_1 \text{ROI} + b_2 \Delta \text{ROI} + c_1 \text{ROE} + c_2 \Delta \text{ROE} + u_{6t}$

The models developed above by Maditinos, Sevic, Chatzoglou and Theriou (2007) assessed the information content of the performance variables at both level and change positions in explaining stock return in the context of Greek stock market. The research conducted by Kyriazis & Anastassis (2007) adopted the levels and change model of Easton and Harris (1991) which proposed the relation between earnings with stock returns. The study conducted by Worthington & West (2004) employed the valuation and components model that tested the information content of performance measures on Stock return of Australian firms. The study conducted by Elali (2006) adopted the statistical models of Biddle et al. (1997), Chen and Dodd (1997), and Kramer and Pushner (1997) to test the value relevance of EVA and its components - PS, TIC, and Lagged EVA compared to TSR and Tobin's Q in explaining MVA, a proxy for Shareholder wealth. Hall (2016) employed the MAR and MVA based models to test the value relevance of accounting-based measures as well as economic based measure like EVA in determining Stock return and MVA. Step-wise regression was performed by Hall to determine the exclusive set of value drivers in specific industries in the context of South African stock market. Based on the above theoretical background, the models were developed that tests the relative and incremental information content of the predictor variables in explaining shareholder value. All the models were estimated using panel data regression analysis. Panel data analysis has been performed to enhance the quality of data as it factors in the dimension of time series and cross section. In order to understand MVA as a proxy of shareholder value, this paper investigates the empirical value relevance of EVA and accounting-based performance measurements.

Measurement of Variables

The dependent variable in the study is MVA. The independent variables are ROE, ROA, EPS, PAT and EVA which are considered at both level and change positions in the relative information content tests of the models. The change (differenced) position for the independent variables is calculated as the difference in the respective variable over period t-1 to t.

MVA - MVA is the difference between the market value of a firm and the capital employed by the firm. Since, market and book value of debt is same, the formula is further simplified as the difference between Market value of equity and book value of equity.

MVA / Average Invested Capital = MVA is normalized by dividing the value of MVA by the average invested capital.

ΔMVA - Change in MVA over period t-1 to t

ROE = Profit After Tax / Average Equity

ΔROE - Change in ROE over period t-1 to t

ROA = Profit After Tax / Total Assets

ΔROA - Change in ROA over period t-1 to t

Earnings Per Share (EPS) = EPS/P_{t-1}

Where P_{t-1} is share price at the beginning of the year

ΔEPS - Change in EPS over period t-1 to t

PAT is Profit after tax in a given year for a company.

ΔPAT - Change in PAT over period t-1 to t

EVA = NOPAT - WACC * Average Invested Capital;

Where **NOPAT (Net Operating Profit After Tax)** = Operating Profit(1-t) where " t " is the marginal tax rate;

WACC (Weighted Average Cost of Capital) = $E/E+D * K_e + D/E+D * K_d$;

Where E = Equity capital;

D = Long term Borrowings or Debt;

K_e = Cost of Equity;

K_d = Cost of Debt;

Cost of Equity (K_e) is calculated using CAPM Model;

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

R_f = Risk free rate (yield on 364 days government bond was taken)

β = Covariance (Stock Return, Market Return) / Variance (Market Return)

$R_m = \{(\text{Current Index} - \text{Previous Index}) / \text{Previous Index}\} * 100$

Cost of Debt (k_d) = $\{\text{Interest Expense} / \text{Average Borrowings}\} * (1-t)$

Beta(β) is the sensitivity of return of a stock to changes in market return.

Market rate of return (R_m) is calculated from average yearly return of CNX NIFTY Indices.

Tax rate was taken as 35% applicable to companies

Market Risk Premium ($R_m - R_f$)

Rakshit (2006) considered long run averaged annualized daily return of BSE-SENSEX from 1st April 1991 to 31st March 2003 for the purpose of calculating market return. While computing market return, abnormality in the market index should not be eliminated and should be filtered through increasing the sample size. The long run period represents all cycles and abnormalities of the capital market. For instance, the risk containment measures in the Indian stock index futures market were analysed by the J.R. Varma Committee using data for the period ranging 1st July 1990 to 30th June 1998. The aim of choosing a long sample period was to consider two full business cycles that would cover more than two interest rate cycles and two stock market cycles. Prof. Varma also provided the reason for inclusion of 1992 as it was a period of security scam that affected the index predominantly. In this study, Market Return (R_m) is computed using long run averaged yearly return of CNX NIFTY 500 for a period of 20 years from 1999-2000 to 2018-19 which arrived at 13% p.a. Likewise, the average risk-free rate on 364 days government bond for the same period is computed, which arrived at 7.895% p.a. Thus, by subtracting the latter from former, market risk premium is 5.105% p.a. This percentage of market risk premium is used in the calculation of cost of equity for all the companies.

EVA / Average Invested Capital = EVA is normalized by dividing the value of EVA by the average invested capital.

ΔEVA - Change in EVA over period t-1 to t

6. Results and Discussion

6.1 Relative Information Content Test - Explanatory Variables and MVA

The relative information content of explanatory variables on MVA was investigated using the panel data regression equations shown below. Time-based dummies have been included in the models because temporal effects are important when analysing the variables. All models are estimated using robust standard errors, and PAT log transformation has been used to eliminate the risk of heteroscedasticity, which is common in panel data.

Model (1): Market Value Added (MVA) = $a_0 + a_1 \text{EPS}/P_{t-1, it} + a_2 \Delta \text{EPS}/P_{t-1, it} + Y_2 E_2 + \dots + Y_n E_n + u_{it}$

Model (2): Market Value Added (MVA) = $b_0 + b_1 \text{ROA}_{it} + b_2 \Delta \text{ROA}_{it} + Y_2 E_2 + \dots + Y_n E_n + u_{it}$

Model (3): Market Value Added (MVA) = $c_0 + c_1 \text{ROE}_{it} + c_2 \Delta \text{ROE}_{it} + Y_2 E_2 + \dots + Y_n E_n + u_{it}$

Model (4): Market Value Added (MVA) = $d_0 + d_1 \log \text{PAT}_{it} + d_2 \log \Delta \text{PAT}_{it} + Y_2 E_2 + \dots + Y_n E_n + u_{it}$

Model (5): Market Value Added (MVA) = $e_0 + e_1 \text{EVA}_{it} + e_2 \Delta \text{EVA}_{it} + Y_2 E_2 + \dots + Y_n E_n + u_{it}$

The Hausman's specification test (Hausman, 1978) is used to determine if the fixed or random panel regression should be performed. Fixed effects regression is done for the above models based on the chi-square statistics of Hausman's specification test.

Table I shows the results of relative information content tests using panel data regression models (1-5) based on the Easton and Harris (1991) model. It can be concluded that all of the models are significant based on parameters such as F-statistics and R-square values, coefficients, and Z-statistics at both the level (undifferenced) and change (differenced) positions of the independent variables. This implies that the Easton and Harris (1991) model will be useful in establishing the value relevance of explanatory variables like EPS, ROA, ROE, PAT, and EVA on changes in MVA. The model (5) is extremely significant, explaining around 81% of the variation in MVA, as evidenced by the high R-square value, which is significant at the 0.05 level. It is evident that EVA provides a more substantial and better information content in predicting MVA. When there is a one-unit change in EVA, there is a 12.78% change in MVA. Similarly, ROA and ROE are good predictors of MVA, as evidenced by R-square values that explain more than 79% of the variance in MVA. A one-unit increase in ROA and ROE contributes to a 16.54% and 6.24% increase in MVA, respectively. Further, PAT has been significant with a R-square value that explains about 78% of variance in MVA and the level co-efficient of PAT is 2.378, significant at 0.01 level. The model (1) with EPS as the explanatory variable has been quite significant with a R-square value of 0.7797. Nevertheless, only ΔEPS has been significant with a coefficient of 4.024 which is significant at 0.05 level. It can be observed that ΔROA is significant with a negative impact on MVA.

Based on the significant coefficients at both the level and change positions, as well as the F-statistics, it is possible to conclude that EPS, ROA, ROA, ROE, PAT, and EVA are significant predictors of MVA. This results in H1 acceptance when these performance measures (EPS, ROA, ROE, PAT, EVA) are combined at the levels and change positions to have a significant value relevance on Market Value Added (MVA).

6.2 Incremental Information Content Test – Explanatory Variables and MVA

Model (6): $MVA = a_0 + a_1 \text{EPS}/P_{t-1, it} + b_1 \text{ROA}_{it} + Y_2 E_2 + \dots + Y_n E_n + u_{it}$

Model (7): $MVA = b_0 + a_1 \text{EPS}/P_{t-1, it} + c_1 \text{ROE}_{it} + Y_2 E_2 + \dots + Y_n E_n + u_{it}$

Model (8): $MVA = c_0 + a_1 \text{EPS}/P_{t-1, it} + d_1 \log \text{PAT}_{it} + Y_2 E_2 + \dots + Y_n E_n + u_{it}$

Model (9): $MVA = d_0 + a_1 \text{EPS}/ P_{t-1, it} + e_1 \text{EVA}_{it} + Y_2 E_2 + \dots + Y_n E_n + u_{it}$

Model (10): $MVA = e_0 + b_1 \text{ROA}_{it} + c_1 \text{ROE}_{it} + Y_2 E_2 + \dots + Y_n E_n + u_{it}$

Model (11): $MVA = f_0 + b_1 \text{ROA}_{it} + d_1 \log \text{PAT}_{it} + Y_2 E_2 + \dots + Y_n E_n + u_{it}$

Model (12): $MVA = g_0 + b_1 \text{ROA}_{it} + e_1 \text{EVA}_{it} + Y_2 E_2 + \dots + Y_n E_n + u_{it}$

Model (13): $MVA = h_0 + c_1 \text{ROE}_{it} + d_1 \log \text{PAT}_{it} + Y_2 E_2 + \dots + Y_n E_n + u_{it}$

Model (14): $MVA = i_0 + c_1 \text{ROE}_{it} + e_1 \text{EVA}_{it} + Y_2 E_2 + \dots + Y_n E_n + u_{it}$

Model (15): $MVA = j_0 + d_1 \log \text{PAT}_{it} + e_1 \text{EVA}_{it} + Y_2 E_2 + \dots + Y_n E_n + u_{it}$

The results of the regression models (6 to 15) derived from combinations of explanatory variables (EPS, ROA, ROE, PAT, EVA) in predicting the indicator of shareholder value - MVA are shown in table II. All of the models produced VIF values less than 10. Fixed effects regression is done for all models (6 to 15) based on the chi-square statistics of Hausman's specification test. All models are estimated using robust standard errors, and PAT is log transformed to eliminate the risk of heteroscedasticity, which is frequent in panel data.

It can be concluded from an analysis of the parameters, including the F-statistics, R-square values, coefficients, and Z-statistics of the models (6 to 15), that all of the models have demonstrated greater explanatory power, as indicated by their significant F-statistics and higher R-square values. All of them are value relevant and can explain more than 78% of the variance in MVA. The pairwise combination of EPS and EVA (model 9) in particular has been able to deliver the most additional information content when compared to other combinations, as evidenced by the highest R-square value of 0.8199 and significant F-statistics at the 0.01 level. Similarly, the pairwise combination of ROE and EVA (model 14) has provided higher incremental information content, as evidenced by the model R-square value of 0.8118, which is significant at the 0.05 level. In a similar manner, the pairwise combination of ROA and EVA (model 12) and PAT and EVA (model 15) could incrementally provide more information content in explaining variance in MVA by 80.9% and 80.75%, respectively, at the 0.05 level.

Furthermore, the pairwise combination of EPS with ROA (model 6) and EPS with ROE (model 7) contributed to considerable incremental information content in explaining MVA, with reported R-square values of 0.8027 and 0.7987, both significant at the 0.01 level. Similarly, two explanatory variable combinations, ROA with ROE (model 10) and ROA with PAT (model 11), were able to give superior value relevance with higher R-square values explaining approximately 79% of the variance in MVA. Similarly, the pairwise combination of ROE and PAT (model 13) and EPS and PAT (model 8) were able to be more value relevant, incrementally adding to explaining MVA to the degree of 78%.

Overall, the pairwise linking of EVA with the traditional accounting-based explanatory variables EPS, ROE, ROA, and PAT has greatly improved the level of incremental information that can be used to explain MVA. As a result, H2 is accepted, and it turns out that EVA is more valuable than traditional accounting-based indicators of performance in explaining MVA.

The findings are consistent with the claims made by EVA proponents and with earlier research by Feltham et al. (2004) & Elali (2006), Worthington and West (2004), Grant (2003), Bao and Bao (1998), Lehn and Makhija (1997), O'Byrne (1996) that restated the information effectiveness of EVA.

The table III illustrates the top 10 value creating manufacturing companies in NIFTY Midcap 100 during the ten-year period from 2008-09 to 2018-19. Based on EVA% values, Castrol India Ltd. in

Oil and Gas industry has exhibited the highest average EVA% with 69.08% demonstrating its ability to generate higher economic profits. Likewise, Jubilant Foodworks Ltd. in Consumer Goods industry and Ajanta Pharmaceuticals Ltd. in Pharma industry have significantly enhanced shareholder wealth throughout the course of ten years with the average EVA% values of 19.3% and 11.85% respectively. Bata India Ltd. in Consumer goods industry and Indraprastha Gas Ltd. in Energy industry have been performing well and generated significantly greater economic profits over the ten-year period. It is quite evident that the Castrol India Ltd. stands out from the crowd of capital-intensive companies that has added phenomenally greater value to its shareholders wealth compared to all others.

Based on MVA%, Castrol India Ltd. (2233.72%) has reported the highest average value of MVA% indicating high prospects for future economic profits. Jubilant Foodworks Ltd. (1605.38%) has shown the second highest average MVA%. Likewise, Emami Ltd., Whirlpool of India Ltd., Bata India Ltd., belonging to Consumer goods industry have exhibited higher values of average MVA%. Further, Cummins India Ltd. in Industrial Manufacturing industry and Ajantha Pharmaceutical Ltd. belonging to Pharma industry were able to utilize the capital productively during the ten-year period. It is quite evident that the companies belonging to Consumer Goods industry were able to appreciate the wealth of shareholders.

The table IV illustrates the bottom 10 value destroying manufacturing companies in NIFTY Midcap 100 for the ten-year period from 2008-09 to 2018-19. Based on EVA% values, Escorts Ltd. in Automobile industry has reported the lowest negative average EVA % (-10.44%) showing its inability to productively utilize the capital that amounts to destruction of shareholder value. Likewise, GMR Infrastructure Ltd. in Construction industry and National Aluminium Co. Ltd. in Metal industry have significantly destroyed shareholder wealth with negative average EVA% of -8.35% and -6.43% respectively. It is quite evident that predominantly companies belonging to Metal and Energy industries that require huge investments and highly capital intensive have found their place in the bottom ten value destroying companies.

Based on MVA%, CESC Ltd. belonging to Energy industry has registered the lowest negative average MVA% (-4.64%). Companies belonging to Metal industry like Steel Authority of India Ltd. (9.44%), National Aluminium Co. Ltd. (28.62%) have registered lower levels of average MVA% values during the study period. It shows their operational inefficiency and inability to make productive investments in turn, not able to generate value to shareholder wealth.

7. Conclusion

In the Indian capital market context, the Easton and Harris (1991) model has demonstrated robust performance in elucidating the value relevance of explanatory variables pertaining to shareholder value. Particularly noteworthy is the efficacy of Economic Value Added (EVA) as the most proficient predictor variable in delineating Market Value Added (MVA) within the domain of midcap manufacturing enterprises. The collective performance metrics, including EPS, ROA, ROE, PAT, and EVA, both at the level and change positions, exhibit considerable value relevance in explaining fluctuations in shareholder value as reflected by MVA. Notably, the integration of EVA with traditional accounting-based measures yields better incremental information content for explaining MVA. EVA emerges as more instrumental in determining MVA compared to

traditional metrics like EPS, ROA, ROE, and PAT. In portfolio selection for investments, stakeholders must consider both traditional accounting metrics and value-based ones. Scrutinizing and assessing prospective investments based on performance measures at both levels and change positions is imperative. MVA stands out as a primary measure of shareholder value, with companies exhibiting positive EVA considered attractive investments, indicating value creation for shareholders. In the Indian context, companies can benefit from evaluating their performance using EVA alongside traditional measures, providing consistency with shareholder value creation. Utilizing previous year EVA values as benchmarks in annual financial statements can inform investors about growth prospects, fostering informed decision-making. Mandating disclosures of value-based measures like EVA and MVA in company annual reports can serve as benchmarks for evaluating long-term business worth. The research findings hold implications for various stakeholders, including creditors, government entities, employees, directors, portfolio managers, and senior management. Future research endeavours could focus on analysing the value relevance of EVA and traditional performance measures on shareholder value creation across diverse industries, with a specific exploration of the financial services sector and comparative assessments with other sectors.

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Table I: Summary (all years) Results of Relative Information Content Test - Models (6 to 10)

	Model 1	Model 2	Model 3	Model 4	Model 5
Explanatory variables	EPS	ROA	ROE	PAT	EVA
Intercept coefficient	3.312*** (z=4.783)	1.064* (z=1.664)	1.075 ^{NS} (z=1.391)	2.657*** (z=8.007)	1.912*** (z=4.491)
Level coefficient	-6.060 ^{NS} (z= -1.359)	16.543*** (z=2.659)	6.424** (z=2.203)	2.378*** (z=3.591)	12.782*** (z=2.796)
Change coefficient	4.024** (z=2.295)	-6.887* (z= -1.815)	-1.870 ^{NS} (z= -1.165)	0.139 ^{NS} (z=0.396)	-1.682 ^{NS} (p= -1.418)
F - Statistics	11.973*** (p=0.000)	4.380** (p=0.017)	2.589* (p=0.085)	7.217*** (p=0.001)	3.909** (p=0.026)
R square	0.7797	0.7968	0.7912	0.7794	0.8081
Hausman's test statistics (χ^2)	6.635 (p=0.036)	7.309 (p=0.025)	20.665 (p=0.000)	13.591 (p=0.001)	20.317 (p=0.000)

	Model 1	Model 2	Model 3	Model 4	Model 5
Fixed/random effects	Fixed effects model	Fixed effects model	Fixed effects model	Fixed effects model	Fixed effects model
Wald joint test on time dummies	$\chi^2=53.734^{**}$ * (p=0.000)	$\chi^2=42.657^{**}$ * (p=0.000)	$\chi^2=44.198^{**}$ * (p=0.000)	$\chi^2=43.267^{**}$ * (p=0.000)	$\chi^2=39.763^{**}$ * (p=0.000)
Durbin-Watson	0.807	0.832	0.804	0.801	0.807

***p < 0.01; **p < 0.05; *p < 0.1 & ^{NS} is not significant.

*significance at 10% level, ** significance at 5% level, *** significance at 1% level

Table II – Summary (all years) Results of Incremental Information Content Test - Models (6 to 15)

	Constant	EPS	ROA	ROE	PAT	EVA
Model 6						
Coefficient	2.166	-5.928	15.725			
Z-Statistic	5.255*** (p=0.000)	-1.990** (p=0.046)	3.253*** (p=0.001)			
R ²	0.8027					
F-statistic	5.515*** (p=0.006)					
Hausman's test statistics	20.333 (p=0.000)					
Fixed/Random effects model	Fixed effects model					
Wald joint test on time dummies (χ^2)	48.354*** (p=0.000)					
VIF		1.338	1.136			
Model 7						
Coefficient	2.074	-5.818		6.675		
Z-Statistic	3.741*** (p=0.000)	-1.711* (p=0.087)		2.441** (p=0.014)		
R ²	0.7987					
F-statistic	2.980* (p=0.060)					
	76.470					

	Constant	EPS	ROA	ROE	PAT	EVA	
	Hausman's test statistics	(p=0.000)					
	Fixed/Random effects model	Fixed effects model					
	Wald joint test on time dummies (χ^2)	52.745*** (p=0.000)					
	VIF	1.366		1.204			
Model 8	Coefficient	3.318	-3.351		2.723		
	Z-Statistic	5.207*** (p=0.000)	-1.032 ^{NS} (p=0.301)		4.023*** (p=0.000)		
	R ²	0.7827					
	F-statistic	8.105*** (p=0.000)					
	Hausman's test statistics	12.272 (p=0.002)					
	Fixed/Random effects model	Fixed effects model					
	Wald joint test on time dummies (χ^2)	47.094*** (p=0.000)					
	VIF		1.226		1.039		
	Model 9	Coefficient	3.087	-6.855		14.375	
		Z-Statistic	7.001*** (p=0.000)	-1.961** (p=0.049)		3.014** * (p=0.002)	
R ²		0.8199					
F-statistic		6.367*** (p=0.003)					
		12.938					

	Constant	EPS	ROA	ROE	PAT	EVA
Hausman's test statistics	(p=0.002)					
Fixed/Random effects model	Fixed effects model					
Wald joint test on time dummies (χ^2)	51.812*** (p=0.000)					
VIF		1.287				1.097
Model 10						
Coefficient	1.290		11.407	0.669		
Z-Statistic	3.369*** (p=0.000)		2.770*** (p=0.005)	0.355 ^{NS} (p=0.722)		
R ²	0.7934					
F-statistic	21.504*** (p=0.000)					
Hausman's test statistics	42.113 (p=0.000)					
Fixed/Random effects model	Fixed effects model					
Wald joint test on time dummies (χ^2)	39.454*** (p=0.000)					
VIF			5.648	5.867		
Model 11						
Coefficient	1.321		12.742		-0.025	
Z-Statistic	1.792* (p=0.073)		2.109** (p=0.035)		-0.020 ^{NS} (p=0.983)	
R ²	0.7933					
F-statistic	5.994*** (p=0.005)					
Hausman's test statistics	15.738 (p=0.000)					

	Constant	EPS	ROA	ROE	PAT	EVA
	Fixed/Random effects model	Fixed effects model				
	Wald joint test on time dummies (χ^2)	40.543*** (p=0.000)				
	VIF		1.110		1.108	
Model 12	Coefficient	2.440	-8.347			17.158
	Z-Statistic	3.467*** (p=0.000)	-0.768 ^{NS} (p=0.442)			2.001** (p=0.045)
	R ²	0.8093				
	F-statistic	4.362** (p=0.018)				
	Hausman's test statistics	28.065 (p=0.000)				
	Fixed/Random effects model	Fixed effects model				
	Wald joint test on time dummies (χ^2)	41.655*** (p=0.000)				
	VIF		3.683			3.698
Model 13	Coefficient	1.337		5.129	0.167	
	Z-Statistic	3.114*** (p=0.002)		4.597** * (p=0.000)	0.202 ^{NS} (p=0.839)	
	R ²	0.7897				
	F-statistic	17.381*** (p=0.000)				
	Hausman's test statistics	53.790 (p=0.000)				
	Fixed/Random effects model	Fixed effects model				

	Constant	EPS	ROA	ROE	PAT	EVA
Wald joint test on time dummies (χ^2)	43.556*** (p=0.000)					
VIF				1.171	1.125	
Coefficient	2.844			-5.595		19.570
Z-Statistic	4.725*** (p=0.000)			-1.505 ^N _s (p=0.132)		2.607** * (p=0.009)
R ²	0.8118					
F-statistic	4.152** (p=0.021)					
Hausman's test statistics	20.369 (p=0.000)					
Fixed/Random effects model	Fixed effects model					
Wald joint test on time dummies (χ^2)	39.989*** (p=0.000)					
VIF				4.680		4.523
Coefficient	1.874				-0.418	12.293
Z-Statistic	3.750*** (p=0.000)				-0.379 ^{NS} (p= 0.704)	2.442** (p=0.014)
R ²	0.8075					
F-statistic	4.757** (p=0.013)					
Hausman's test statistics	16.479 (p=0.000)					
Fixed/Random effects model	Fixed effects model					
Wald joint test on time	39.840*** (p=0.000)					

	Constant	EPS	ROA	ROE	PAT	EVA
dummies						
$\frac{(\chi^2)}{\text{VIF}}$					1.051	1.057

***p < 0.01; **p < 0.05; *p < 0.1 & ^{NS} is not significant.

*significance at 10% level, ** significance at 5% level, *** significance at 1% level

Table III – Top 10 Value Creating Midcap Companies based on Value based Measures

Top 10 Value Creating Companies			
Indicators of Value Creation	Industry	Company Name	Avg. Value (%)
EVA	Oil & Gas	Castrol India Ltd.	69.08
	Consumer Goods	Jubilant Foodworks Ltd.	19.33
	Pharma	Ajanta Pharmaceuticals Ltd.	11.85
	Consumer Goods	Bata India Ltd.	10.28
	Energy	Indraprastha Gas Ltd.	10.17
	Consumer Goods	Emami Ltd.	8.37
	Industrial Manufacturing	H.E.G. Ltd.	8.03
	Construction	Engineers India Ltd.	7.79
	Consumer Goods	V-Guard Industries Ltd.	7.73
	Industrial Manufacturing	Cummins India Ltd.	7.65
MVA	Oil & Gas	Castrol India Ltd.	2233.72
	Consumer Goods	Jubilant Foodworks Ltd.	1605.38
	Consumer Goods	Emami Ltd.	936.67
	Consumer Goods	Whirlpool of India Ltd.	668.61
	Consumer Goods	Bata India Ltd.	588.50
	Industrial Manufacturing	Cummins India Ltd.	551.87
	Pharma	Ajanta Pharmaceuticals Ltd.	519.74
	Consumer Goods	V-Guard Industries Ltd.	519.51
	Consumer Goods	Bombay Burmah Trading Corporation Ltd.	488.20
	Automobile	Amara Raja Batteries Ltd.	374.09

Table IV – Bottom 10 Value Destroying Midcap Companies based on Value based Measures

Bottom 10 Value Destroying Companies			
Indicator s of Value Creation	Industry	Company Name	Avg. Value (%)
EVA		Escorts Ltd.	-
	Automobile		10.44
	Construction	GMR Infrastructure Ltd.	-8.35
	Metals	National Aluminium Co. Ltd.	-6.43
	Energy	JSW Energy Ltd.	-6.29
	Consumer Goods	Godrej Industries Ltd.	-6.25
	Cement & Cement Products	The Ramco Cements Ltd.	-6.00
	Metals	Steel Authority of India Ltd.	-5.40
	Energy	Adani Power Ltd.	-5.34
	Pharma	Jubilant Life Sciences Ltd.	-5.01
Energy	Tata Power Co. Ltd.	-4.72	
MVA	Energy	CESC Ltd.	-4.64
	Metals	Steel Authority of India Ltd.	9.44
	Metals	National Aluminium Co. Ltd.	28.62
	Oil & Gas	Oil India Ltd.	35.52
	Energy	Torrent Power Ltd.	35.82
	Construction	GMR Infrastructure Ltd.	36.36
	Energy	Adani Power Ltd.	38.42
	Energy	Mangalore Refinery & Petrochemicals Ltd.	42.74
	Energy	Tata Power Co. Ltd.	48.88
	Energy	JSW Energy Ltd.	52.21