ECONOMIC VALUE ADDED (EVA) AND OTHER ACCOUNTING PERFORMANCE INDICATOR: AN EMPIRICAL ANALYSIS OF INDIAN AUTOMOBILE INDUSTRY

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ABSTRACT:

The growth of Indian capital market has increased the pressure on the companies to consistently perform better. Corporate performance is affected by various factors ranging from company specific, industry specific and economic variables. According to Rappaaport(1986), there are seven drivers such as sales growth rate, operating profit margin, income-tax rate, working capital investment, fixed capital investment, cost of capital and forecast duration that can be managed to create value. Traditionally, periodic corporate performance is most often measured using some traditional accounting measures such as EPS,ROCE,RONW, capital productivity and labour productivity. Among the set of popular Value Based Management system, Economic Value Added(EVA) is the prominent. This study examine whether EVA has got a better predictive power relative to the traditional accounting measures such as EPS, ROCM, RONW, capital productivity and labour productivity. The study supports the claim that the EVA is the better predictor of market value compared to other accounting measures.

KEY WORDS: ECONOMIC VALUE ADDED, SHAREHOLDERS WEALTH, VALUE BASED MANAGEMENT , MARKET VALUE ADDED, CORPORATE PERFORMANCE AND EARINGS PER SHARE.

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Corporate performance measurement is one of the emerging areas of research in finance among the researchers all over the world. Several studies are carried to find out what influences the share price (market price) of a company. Corporate performance is affected by various factors ranging from company specific, industry specific and economic variables. For long, there had been wide acceptance on the objective of the firm to maximize the value or wealth maximization. While the principle that fundamental objective of the business concerns is to increase the value of its shareholder's investment is widely accepted, there is substantially less agreement about how this is accomplished **(Rappaport, 1986).** As the lenders (debt and others), can protect themselves contractually, the objective can be narrowed down to maximizing stockholders value or stockholders wealth. When financial markets are efficient, the objective of maximizing stockholder wealth can be narrowed even further – to maximizing stock prices **(Damodaran, 1996).**

Even through stock price maximization as an objective is the narrowest of the value maximization objectives, it is the most prevalent one. It is argued that the stock prices are the most observable of all measures that can be used to judge the performance of a publicly traded firm. Besides this, the stock price is a real measure of stockholder wealth, since stockholders can sell their stock and receive the price now. While the responsibility of firm value maximization has to be fixed with the managers, using stock prices as a measure of periodic measure of corporate performance throws a serious problem. While many argue that the stock prices are not under the full control of the managers, there are many others who believe that stock price maximization leads to a short-term focus for manager-as the stock prices are determined by traders, short-term investors and analysts, all of whom hold the stock for short-periods and spend their time trying to forecast next quarter's earnings.

According to **Rappaport (1986),** within a business, there are seven drivers (sales growth rate, operating profit margin, income tax rate, working capital investment, fixed capital investment, cost of capital and forecast duration) that can be managed to create value. The theory suggests that improvement in these value drivers leads to an increase in shareholders' value. So, traditionally periodic corporate performance is most often measured using some variant of historical accounting income (eg. Net Profit, EPS) or some measures based on the accounting income (eg. ROI / ROCE). However, it had long been recognized that accounting income is not a

consistent predictor of firm value creation and the traditional measures are not appropriate for evaluation of corporate performance.

An appropriate measure of corporate performance on one hand should be highly correlated to share holder return and on the other hand should be able to signal the extent of periodic wealth creation. A search for such a measure had been the trigger for the rapidly growing literature on Value Based Management (VBM). Among the set of popular VBM systems, a variant of the traditional residual income measure known as Economic Value Added (EVA) is arguably the most prominent. Therefore, the present part of analysis examines whether Economic Value Added has got a better predictive power relative to the traditional accounting measures such as Return on Capital Employed(ROCE),Market Value Added(MVA), Return on Sales(ROS), Market Price(MP), Earnings Per Share(EPS), Return on Total Assets(ROTA), Profit After Tax(PAT) and Sales(s) of selected automobile companies in India.

Review of Literature:

Stern (1990)[1] observed that EVA as a performance measure captures the true economic profit of an organisation. EVA-based financial management and incentive compensation scheme gives managers better-quality information and superior motivation to make decisions that will create the maximum shareholder wealth in an organisation. **Stewart (1994)[2]** has expanded that adoption of the EVA system by more and more companies throughout the world clearly depicts that it provides an integrated decision - making framework, can reform energies and redirect resources to create sustainable value for companies, customers, employees, shareholders and for management. **Grant (1996)[3]** found that EVA concept might have everlastingly changed the way real profitability is measured. EVA is a financial tool that focuses on the difference between company's after tax operating profit and its total cost of capital. **Luber (1996)[4]** confirmed that a positive EVA over a period of time will also have an increasing MVA while negative EVA will bring down MVA as the market loses confidence in the competence of a company to ensure a handsome return on the invested capital.

Banerjee (1997)[5] has conducted an empirical research to find the superiority of EVA over other traditional financial performance measures. ROI and EVA have been calculated for

sample companies and a comparison of both showing the superiority of EVA over ROI. **Ethiraj (1998)**[6] derived those stock prices moves up as a company adopts EVA as an internal performance criterion. KPMG - BS **study (1998)**[7] assessed top 100 companies on EVA, Sales, PAT and MVA criteria. The Survey has used the BS - 1000 list of companies using a composite index comprising sales, profitability and compounded annual growth rate of those companies covering the period 1996-97. Sixty companies have been found able to create positive Shareholder Value whereas 38 companies have been found to destroy it. **Anand, et al (1999)**[8] revealed that EVA and MVA are better measures of business performance that NOPAT and EPS in terms of shareholders' value creation and competitive advantage of a firm. **Bao and Bao (1999)**[9] revealed that the EVA is positively and significantly correlated with the firm value. **Harihar (1999)**[10] highlighted some myths regarding EVA. According to him, EVA calculations are not simple and need a lot of adjustments in the financial books. Further, EVA figures can be manipulated to suit the needs of management. **Thenmozhi (1999)**[11] compared EVA with some other traditional measure of corporate performance viz. ROI, EPS, RONW, ROE, ROCE etc. She has referred to some of the shortcomings of the concept of EVA but maintain that EVA is a better measure of corporate performance. **Banerjee (2000)**[12] attempted to find out whether Market Value of Firm if the function of current operational Value (COV) and Future Growth Value (FGV). Based on the analysis of his data he comes to the conclusion that in many cased there was a considerable divergence between MVA and the sum total of COA and FGV.

Riceman, et al (2002)[13] argued that EVA is a performance measure that is being used by an increasing number of companies, but academic research on EVA is limited. **Mangala and Simpy (2002)**[14] discussed the relationship between EVA and Market Value among various companies in India. The results of the analysis confirm stern's hypothesis and concluded that the company's current operational value was more significant in contributing to change in market value of share in Indian context. **Bardia (2002)**[15] revealed that in a dynamic environment, a common investor finds it increasingly difficult to monitor his investments. EVA guides investors in evaluating the performance of the company and monitoring their investments. **Stern, Joel (2003)**[16] presented the results of Stem Stewart's research on Indian companies, which shows considerable need to improve the wealth creation performance and allocation of capital in the Indian economy. They explained how the effective implementation of the EVA framework could

be a solution to address this problem. **Balachandran and Sriram (2005)[17]** made an attempt to study the value created for the shareholders of the company. They used to determine the relationship between Economic Value Added and dividend paid to the shareholders. The study revealed that the company had utilized the dividend-paying fund ploughing back into the business. The company was very conservative in declaring dividend and always had long-term objective of creating wealth to the shareholders, which has been achieved. **Ali M Ghanbari and Narges Sarlak (2006)[18]** empirically reviewed the trend of EVA of Indian Automobile Companies. The results indicate that there was a significant increasing trend in EVA during the period of study and the firms in the automobile industry are moving towards the improvement of their firm's value.

Manorselvi and Vijayakumar (2007) in their study revealed that the traditional measures of performance do not reflect the real value addition to shareholders wealth and EVA has to be explained shareholders value addition. **Vijayakumar (2008)** empirically indicated that Net Operating profit After Tax (NOPAT) and Return on Net Worth (RONW) are the most significant variable with MVA followed by EVA and EPS. **Soral and Shurveer (2009)** revealed that EVA has found to have significant correlation with operating margin. **Vijayakumar (2010),** in his study supports the hypothesis of Stern and Stewart's that MVA of firm was largely positively associated with EVA in all the selected sectors of Indian Automobile industry. It appears that the concept of EVA, as an emerging concept of financial management is fairly clear in the minds of almost all these researches whose studies have been reviewed above. In a fast changing business environment, the investor friendly financial performance measures may be the need of hour.

Measurement of Economic Value Added (EVA):

EVA introduced by Stern Stewart & company is an incarnation of Residual Income concept. Stewart defined 'EVA as an estimate of true economic profit, the amount by which earnings exceed or fall short of required minimum rate of return investors could get by investing in other securities of comparable risk'. It is the net operating profit minus the appropriate charge for the opportunity cost of capital invested in an enterprise (both debt and equity).

Expressed as a formula, EVA for a given period can be written as:

EVA   = NOPAT - COST OF CAPITAL EMPLOYED

= NOPAT – (WACC x CE)

Where

NOPAT   - Net Operating Profit After Taxes but before financing costs

WACC   - Weighted Average Cost of Capital; and

CE   - Capital Employed

(or)

equivalently, if rate of return is defined as NOPAT / CAPITAL , this turns into a perhaps more revealing formula:

EVA   = (RATE OF RETURN – COST OF CAPITAL) X CAPITAL

Where

Rate of return   -   NOPAT / CAPITAL

Capital Employed   -   Total of balance sheet minus non-interest bearing debt in the beginning of

the year.

Cost of Capital   - [Cost of equity X proportion of equity from capital] + [(cost of debt X

proportion   of debt from capital) X (1-tax rate)]

Cost of capital or weighted average cost of capital is the average cost of both equity capital and interest bearing debt.

Cost of debt (K_d)

Cost of debt refers to the average rate of interest the company pays for its debt obligations. Cost of debt (K_d) has been computed as:

K_d =   Total interest expenses X (1-Effective tax rate) /

Beginning total borrowings

While calculating beginning borrowing all short-term as well as long-term borrowings has to be included as all debts are interests bearing. Therefore, interest paid in the financial year has been considered as total interest expenses.

Cost of equity (K_e)

To find out cost of equity (K_e), Capital Assets Pricing Model (CAPM) has been used. This model holds that firms' equity cost is the composition of risk free rate of return for a stock plus premium representing the volatility of share prices. According to this model, K_e is the shareholders' expected rate of return and this expected rate of return (R_j) is as follows:

$$R_j = R_f + \beta \ X \ (R_m - R_f)$$

Where, R_f - Risk free rate of return,

R_m - Market rate of return, and

β - Sensitivity of the share price in relation to the market index

The interest rate of Government securities has been considered as a proxy for risk free rate of return. The market rate of return has been calculated by using Index Numbers of Security Prices (Bombay Stock Exchange) from year to year basis. The yearly return of the index numbers has been computed by using the following formula:

R_m = [(Index number for current year – Index number for previous

Year) / (Index number of previous year)] x 100

Beta (β) is the risk-free co-efficient which measures the volatility of a given script of a company with respect to volatility of market. It is calculated by comparing return on a share to return in the stock market. Mathematically, beta is the statistical measure of volatility. It is calculated as covariance of daily return on the stock market indices and the return on daily share prices of a particular company, divided by variance of return on daily stock market indices. The Beta co-efficient has been calculated as follows:

$$\beta_j = COV_{im} / \sigma_m^2$$

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137

where, β_j - is the Beta of the security in the question

COV_{im} - stands for co-variance between the return of security and return of market, and

$\sigma_m{}^2$ - stands for the variance of market return

Market Value Added (MVA):

While EVA measures shareholder value addition of firm in terms of its real economic performance, MVA measures market's assessment of firm's value. MVA thus measures value by the management over and above the capital invested in the company by investors.

Market Value Added (MVA) = Market value of company - Capital employed

For a public limited company, its market value is calculated as market value of its equity (number of shares outstanding times their share price) plus book value of debt (since market value of debt is generally not available). Capital employed is effectively the book value of investments in the business made-up of debt and equity. Effectively, the formula becomes

Market Value Added (MVA) = Market value of equity - Book value of equity

These items have been obtained from balance sheet statement of companies. Data for the market price existing on the close of financial year has been collected from the Economic Times, CMIE Prowess and Capitaline databases.

Sampling Selection:

Keeping in view the scope of the study, it is decided to include all the companies under automobile industry working before or from the year 1996-97 to 2008-09. There are 26 companies operating in the Indian automobile industry. But, owing to several constraints such as non-availability of financial statements or non-working of a company in a particular year etc., it is compelled to restrict the number of sample companies to 20. Out of 20 selected companies under Indian Automobile Industry, three Multinational Companies (MNC's) namely Hyundai

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138

Motors India Ltd, Honda Siel Cars India Ltd and Ford India Private Ltd were omitted because these companies established their operations in India in different accounting years. The companies under automobile industry are classified into three sectors namely; Commercial vehicles, Passenger cars and Multi-utility vehicles and Two and three wheelers. For the purpose of the study all the three sectors have been selected. It accounts for 73.23 per cent of the total companies available in the Indian automobile industry. The selected 20 companies include 5 under commercial vehicles, 3 under passenger cars and multi-utility vehicles and 9 under two and three wheeler sectors. It is inferred that sample company represents 98.74 percentage of market share in commercial vehicles, 79.76 percentage of market share in passenger cars and Multi-utility vehicles and 99.81 percentage of market share in two and three wheelers. Thus, the findings based on the occurrence of such representative sample may be presumed to be true representative of automobile industry in the country.

The study is mainly based on secondary data. The major source of data analysed and interpreted in this study related to all those companies selected is collected from "PROWESS" database, which is the most reliable on the empowered corporate database of Centre for Monitoring Indian Economy (CMIE). Besides prowess database, relevant secondary data have also been collected from BSE Stock Exchange Official Directory, CMIE Publications, Annual Survey of Industry, Business newspapers, Reports on Currency and Finance, Libraries of various Research Institutions, through Internet etc.

Analysis of EVA:

The concept of EVA is well established in financial economics but only recently this term has moved into the main stream of corporate finance, as more and more companies have started adopting it as the base for business planning and financial performance monitoring. There is grouping evidence that EVA, not EBIT, determines the value of a firm. Effective use of capital is the key to value. The present part of analysis examines in detail the EVA of sample companies. A ranking has been done with respect to EVA. Various statistical measures like mean, standard deviation, range, variance, skewness and kurtosis have been computed to understand the central tendency and dispersion of EVA of sample companies. Kendall tau-b has been used to test the

association between the selected financial variables. Multiple regressions have been adopted to find out the best predictor from among the independent variables. EVA based frequency distribution of sample companies is shown by Table 1. It is clear from the Table 1 that during the first six years of the study period, 29.4 per cent in 1996-97, 5.9 percent in 1997-98, 58.9 per cent in 1998-99, 5.9 per cent in 1999-2000, 11.8 per cent in 2000-2001 and 5.9 per cent in 2001-02 have registered negative EVA. Looking at the Table 1 it is also inferred that around 53 per cent to 76 per cent of the sample companies have registered negative EVA during the year 2002-03 to 2008-09.

Around 29 per cent to 47 per cent of the companies during the first six years of the study period and around 6 per cent to 35 per cent of the sample companies during the last six years under study are generating positive EVA, but it has been up to 50 crores. About 6 per cent to 12 per cent of the sample companies from 1996-97 to 2001-02 and about the same percentage of the sample companies from 2003-04 to 2008-09 reported an EVA of over Rs. 100 crores to Rs. 200 crores. Table 1 reveal that the number of companies generating EVA in the range of above Rs. 200 crores has drastically come down during 2002-03 to 2006-07.

Trends in EVA-Based Rankings:

Trends in EVA of sample companies (year-wise ranking) and Trends in EVA of top 5 and last five of the sample companies are portrayed by Table 2 and Table 5. The top five companies include Bajaj Auto Ltd, Hero Honda Motors Ltd, Mahindra and Mahindra Ltd, Ashok Leyland Ltd and Tata Motors Ltd. Out of the these five companies, one company namely Mahindra and Mahindra Ltd belongs to passenger cars and multiutility vehicles sector, two companies namely Bajaj Auto Ltd and Hero Honda Motors Ltd belongs to two and three wheelers sector and the remaining two companies namely Ashok Leyland Ltd and Tata Motors Ltd belongs to commercial vehicles sector. In four out of thirteen years Hero Honda Motors Ltd and three out of thirteen years Tata Motors Ltd and Bajaj Auto Ltd have been holding the first rank. However in the terminal years, Tata Motors Ltd and Bajaj Auto Ltd EVA performance is quite discouraging. Among the last five companies namely Maruti Udyog Ltd, Kinetic Motor

Company Ltd, Majestic Auto Ltd, Kinetic Engineering Ltd and Scooters India Ltd which all belongs to two and three wheelers sector.

Results and Discussion on statistical analysis of EVA:

Different statistical measures have been computed for understanding the central tendency and dispersion of EVA of sample companies. For this purpose, statistical value of the mean, range, standard deviation, variance, skewness and kurtosis have been computed. Kurtosis and skewness have been calculated to show about the distribution (Symmetric/ Asymmetric). Kurtosis is measures of the "peakedness" or the "flatness" of a distribution. A kurtosis value near zero (o) indicates a shape close to normal. A positive value for the kurtosis indicates a distribution more peaked than normal. Negative kurtosis indicates a shape flatter than normal. An extreme negative kurtosis (eg.<–5.0) indicates a distribution where more of the values are in the tails of the distribution that around the mean. A kurtosis value between ± 1.0 is considered excellent for most psychometric purposes and a value between ± 2.0 in many cases also acceptable. Skewness measures to what extent a distribution of values deviates from symmetry around the mean. A value of zero represents a symmetric or evenly balanced distribution. A positive skewness indicates a greater number of smaller values. A negative skewness indicates a greater number of larger values. A skewness value between ± 1 is considered excellent and a value between ± 2 is in many cases acceptable.

Company-wise statistical analysis of EVA is offered by Table 3 where it is observed that out of the selected seventeen companies, twelve companies (71 per cent) have registered positive mean EVA, whereas Bajaj Auto Ltd stands first in the list with the higher average followed by Hero Honda Motors Ltd, Mahindra and Mahindra Ltd, Ashok Leyland Ltd and Tata Motors Ltd. The values of range show the high volatility in EVA and that of standard deviation and variance display the variation scale from central tendency and dispersion. Fourty one per cent companies (7 out of 17) have their EVA positively skewed and 58 per cent companies (10 out of 17) indicate positive kurtosis reflecting that the observations cluster more and with longer tails.

EVA vis-a-vis selected Financial Variables:

Various statistical tools like mean, standard, deviation, variance, range, skewness and kurtosis show inconsistent results to get a grip over EVA's behaviour. Supplementary information based on statistical analysis is considered necessary to understand the behaviour patterns of the EVA measure. The generic research task of this part is to observe and assess how the EVA measure is related with the long established but traditional measures. In this section, an attempt has been made to bring out the basic analysis of relationship between selected financial measures and EVA of selected companies during the study period. These measures include Turnover, Return on sales (ROS), Return on Total Assets (ROTA), Return on Capital Employed (ROCE), Earnings Per Share (EPS), Market Price Per Share (MP) and Market Value Added (MVA). These measures are mainly used to appraise the financial performance of a corporate. Kendall's tau-b has been considered appropriate tool to measure the relationship of EVA with selected financial variables, since it is based on the ranked variables.

Kendall's TAU-B:

It is a non parametric measure of association for ordinal or ranked variables that takes ties into account. The sign of the coefficient indicates the direction of the relationship, and its absolute value indicates the strength, with large absolute values indicating stronger relationships. The relationship of EVA with the selected financial variables has been analysed and are presented in the Table 4. Table 4 puts forward the synoptic description of the relationship of EVA with select financial variables for the selected Indian Automobile Companies during the study period. Glancing all the way through the   Table 4, it is noticed that the correlation between EVA and sales is found at above moderate level in Kinetic Motor Company Ltd and Hero Honda Motors Ltd and significant at 1 per cent level. On the other hand, the correlation between these variables in Maruti Udyog Ltd, Bajaj Auto Ltd and Scooters India Ltd recorded negative trend but significant at   5 per cent level only in Scooters India Ltd. Below moderate level of relationship was found during the study period for the remaining companies with regard to EVA with sales.

The correlation coefficient explaining the relationship between EVA and ROS reveals that below moderate level of relationship was found with regard to EVA with ROS except Kinetic Motor Company Ltd but significant at 1 per cent level. The correlation co-efficient explaining the relationship between EVA with ROTA reveals that below moderate level relationships exists in all the selected companies except Kinetic Motor Company Ltd and Hero Honda Motors Ltd. However, in case of Tata Motors Ltd, Bajaj Auto Ltd, Maharashtra Scooters Ltd and TVS Motor Company Ltd, an adverse relationship is noticed. The table further reveals that there exists below moderate degree but positive correlation in ten out of seventeen companies as regards EVA and ROCE. The degrees of negative correlation observed between EVA and ROCE in Tata Motors Ltd, Mahindra and Mahindra Ltd, Maharashtra Scooters Ltd, TVS Motor Company Ltd and Hero Honda Motors Ltd. It is noticed that the degree of correlation is superior and positive in Kinetic Motor Company Ltd but significant at 1 per cent level. Further, there exists low degree of positive correlation (8 out of 17) and low degree of negative correlation (6 out of 17) between EVA and EPS over the study period. The correlation between EVA and EPS is found at above moderate level only in case of Kinetic Engineering Ltd, Hero Honda Motors Ltd and Scooters India Ltd, with 1 per cent and 5 per cent level of significance.

The relationship between EVA and MP shows that insignificant below moderate level of relationship was found in all the selected companies. Similarly, the correlation between EVA and MVA is though negative in twelve out of seventeen companies, the strength is below moderate level / low in all the companies except LML Ltd during the study period but significant at 5 per cent level. Hence, it is concluded that there exists significant positive relationship between EVA with Sales, ROS, ROTA, ROCE and EPS in the case of Kinetic Motor Company Ltd. Further, EVA is significantly associated with ROS in case of Swaraj Mazda Ltd, with MVA in LML Ltd (but negative), with ROTA in TVS Motor Company Ltd, with ROTA and EPS in Hero Honda Motors Ltd, with ROS and EPS in Kinetic Engineering Ltd and with sales (negative) and EPS in Scooters India Ltd during the study period.

Regression Analysis of selected financial variables:

The present part of analysis makes an attempt to find the relevance of **Stern and Stewards** claim and the hypothesis that EVA of the firm is positively associated with the selected financial variables. The multiple regression analysis between the dependent variable (EVA) and independent variables (Sales, EPS, ROTA, ROCE, PAT, ROS, MP, EPS) is carried out to study the relationship between EVA and other selected financial variables to bump into the simple most significant explanatory variable. The Backward mode of regression analysis to select the best predictor has been considered appropriate for this analysis. Backward method begins with all independent variables in the model, and at each step the least predictor is removed. Variables are removed until an established criterion for the F-Statistics and adjusted R-Square no longer holds good. Accordingly under this method the un-removed variables are the best predictor of the dependent variable.

The analysis of variance and the Durbin- Watson test have been put into use to examine the collision among the dependent and independent variables. In this way, it is determined whether the given classification is important in affecting the results. This can be done via the mechanism of the F and t-tests. The significant value of F and t-indicates that the dependent variable and the independent- variable or the set of independent variables are statistically associated and particularly the independent variables explain the dependent variables in the scientifically accepted fitted model. The results of multiple regression analysis for the whole Indian automobile are presented in Table 6 to Table 8.

It is evident from Table 6 that the value of correlation coefficients are coming down and that of the adjusted R-Square is going up till the 5th model is reached, where the estimated standard error is also minimum. This shows that MVA, EPS, PAT and Sales are the best determinant of EVA of Indian automobile industry during the study period. The Durbin- Watson model rules out any positive auto-correlation between the dependent and independent variables. The Table 7 presents the results of ANOVA analysis. The F- statistics sound that value of the residual is the minimum in 5th model supporting the observation of Table 6 and in Table7, the values are tested significant through F-statistics even at 1 per cent level of significance. Table 8 is interested to find the most explanatory independent variable or set of variables of EVA in

Indian automobile industry. Tested with t-Statistics, the table brings out that the MVA is found significant if tested at 7.1 per cent level whereas EPS, Sales and PAT are observed quite significant even at 1 per cent level of significance. The overall conclusion of Tables 6 to 8 throws light on four most important variables i.e, EPS, Sales, PAT and MVA where in MVA stand fourth and PAT is the best one.

Conclusion:

The results of the study showed that 53 per cent to 76 per cent of the sample companies have registered negative EVA during the terminal years of the study period. The top five companies in generating EVA include Bajaj Auto Ltd, Hero Honda Motors Ltd(two and three wheelers sector), Mahindra and Mahindra Ltd (passenger cars and multiutility vehicles sector), Ashok Leyland Ltd and Tata Motors Ltd(commercial vehicles sector). Below moderate level relationship was found during the study period with regard to EVA with the selected financial variables. The results of factor analysis showed that out of the eight variables, three factors have been extracted and these three factors put together explain 69.902 per cent of the total variance. Further, the results showed that sales and profit after tax are found to have a stronger relationship with EVA. The results of multiple regressions indicate that four variables namely EPS, Sales Pat and MVA better explaining the EVA. The study indicates that there is strong evidence to support Stern Stewart's claim that EVA is superior to the traditional performance measures in its association with MVA.

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145

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Table 1

EVA – Frequency Distribution of Sample Companies (1996-97 to 2008-09)

EVA	96-97	97-98	98-99	99- 00	00-01	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09
Negative	5	1	10	1	2	1	9	4	10	13	8	4	8
Up to Rs.50 Cr	6	7	5	6	8	8	3	6	3	1	3	3	2
Rs.50 Cr to Rs.100 Cr	–	1	–	1	–	1	1	1	2	–	1	2	1
Rs.100 Cr to Rs.200 Cr	2	2	1	1	2	1	2	2	–	2	2	1	–
Above Rs.200 Cr	4	6	1	8	5	6	2	4	2	1	3	7	6
Total	17	17	17	17	17	17	17	17	17	17	17	17	17

Figures in brackets denote percentage to total.
Source : Computed.

Table 2

Trends in EVA (Year--wise)

Company	96-	97-	98-	99-	00-	01-	02-	03-	04-	05-	06-	07-	08-
Ashok Leyland Ltd	3	6	2	8	4	6	4	4	16	16	2	2	6
Tata Motors Ltd	1	1	17	1	6	10	16	3	2	17	17	6	3
Bajaj Tempo Ltd	15	13	12	17	16	16	6	11	13	11	6	9	8
Eicher Motors Ltd	10	16	5	13	9	13	8	8	11	3	11	8	16
Swaraj Mazda Ltd	11	14	4	16	11	14	7	12	6	5	10	11	14
Hindustan Motors	7	7	13	9	14	8	14	17	3	12	13	10	13
Mahindra and	6	4	14	4	3	5	13	5	4	2	3	3	1
Maruti Udyog Ltd	2	2	16	3	17	2	17	9	17	15	5	1	17
Bajaj Auto Ltd	4	3	15	2	1	1	1	7	8	6	12	5	4
LML Ltd	5	5	1	5	2	4	2	2	15	13	9	17	7
Maharashtra	14	10	11	10	12	11	3	10	7	4	7	12	9
TVS Motor Company	8	8	6	7	7	7	15	6	14	14	4	7	5
Kinetic Motor	13	15	9	12	10	9	10	15	12	10	16	16	15
Hero Honda Motors	9	9	3	6	5	3	11	1	1	1	1	4	2
Kinetic Engineering	12	11	8	11	8	12	12	16	5	8	8	15	12
Majestic Auto Ltd	17	17	10	14	13	17	9	13	9	7	14	13	11
Scooters India Ltd	16	12	7	15	15	15	5	14	10	9	15	14	10

Source : Computed.

Table 3

Company -wise statistical analysis of EVA

Company	Mean	SD	CV	CAGR	Variance	Skewness	Kurtosis	Max.	Min.
Ashok Leyland Ltd	268.82	418.77	1.56	0.84	175367.50	2.22	7.23	1508.58	-248.60
Tata Motors Ltd	175.30	937.62	5.35	6.39	879136.10	-0.59	1.55	1888.03	-1937.03
Bajaj Tempo Ltd	5.40	44.46	8.23	11.95	1976.64	0.10	-0.67	77.82	-57.77
Eicher Motors Ltd	4.31	111.29	25.82	24.89	12385.71	-2.08	6.97	164.59	-321.69
Swaraj Mazda Ltd	3.87	27.68	7.15	14.47	766.43	-2.16	7.52	47.35	-78.08
Hindustan Motors Ltd	11.14	87.78	7.88	4.06	7706.02	-0.33	-0.17	138.27	-167.24
Mahindra and Mahindra Ltd	412.04	511.67	1.24	23.94	261809.40	1.12	0.38	1494.67	-178.50
Maruti Udyog Ltd	-34.63	1635.34	-47.22	23.61	2674321	-0.34	1.40	3210.54	-3174.69
Bajaj Auto Ltd	516.17	702.76	1.36	10.24	493873.40	1.27	1.91	2223.75	-425.16
LML Ltd	174.89	224.62	1.28	-5.15	50454.24	-0.43	-1.33	462.71	-165.39
Maharashtra Scooters Ltd	23.52	39.88	1.70	-4.95	1590.17	2.06	5.33	135.48	-28.90
TVS Motor Company Ltd	83.35	179.43	2.15	18.70	32196.19	-0.64	0.43	341.95	-304.01
Kinetic Motor Company Ltd	-23.12	40.88	-1.77	33.00	1671.43	-0.36	-1.01	28.47	-95.70
Hero Honda Motors Ltd	475.80	396.09	0.83	32.03	156884	0.18	-1.60	1060.65	-34.30
Kinetic Engineering Ltd	-2.34	29.87	-12.76	5.80	892.31	-0.49	-1.06	36.60	-55.50
Majestic Auto Ltd	-5.70	12.38	-2.17	-9.55	153.26	-0.06	-0.77	14.78	-27.78
Scooters India Ltd	-0.97	33.43	-34.46	51.12	1117.24	1.98	6.03	94.98	-46.36

Source : Computed

Table 4

EVA with selected Financial variables (whole sample) – Kendall's tau b

Company	Sales	ROS	ROTA	ROCM	EPS	MP	MVA
Ashok Leyland Ltd	0.103	0.000	0.103	0.000	-0.077	-0.179	-0.128
Tata Motors Ltd	0.000	-0.090	-0.103	-0.128	-0.039	-0.077	-0.026
Bajaj Tempo Ltd	0.256	0.179	0.205	0.256	0.142	-0.256	-0.205
Eicher Motors Ltd	0.179	0.179	0.000	0.179	0.103	0.065	-0.206
Swaraj Mazda Ltd	0.026	0.436*	0.359	0.308	0.333	-0.154	0.206
Hindustan Motors Ltd	0.410	0.231	0.128	0.179	0.116	0.090	-0.385
Mahindra and Mahindra Ltd	0.282	-0.051	0.000	-0.103	0.179	0.179	0.051
Maruti Udyog Ltd	-0.103	0.245	0.179	0.179	0.333	-	0.128
Bajaj Auto Ltd	-0.205	0.154	-0.154	0.000	-0.256	-0.333	0.065
LML Ltd	0.333	0.103	0.308	0.359	0.256	0.128	-0.513*
Maharashtra Scooters Ltd	0.000	-0.231	-0.231	-0.205	-0.231	-0.103	0.282
TVS Motor Company Ltd	0.179	-0.245	-0.462*	-0.410	-0.308	-0.385	-0.154
Kinetic Motor Company Ltd	0.718**	0.821**	0.727**	0.818**	0.718**	0.385	-0.256
Hero Honda Motors Ltd	0.641**	0.000	0.503*	-0.026	0.564**	0.385	-0.410
Kinetic Engineering Ltd	0.333	0.487*	0.154	0.282	0.452*	-0.051	-0.128
Majestic Auto Ltd	0.179	0.179	0.179	0.103	-0.077	-0.333	-0.282
Scooters India Ltd	-0.462*	0.385	0.256	0.308	0.538*	-0.333	-0.410

** - Significant at 0.01 level ; * - Significant at 0.05 level; Source : Computed.

Table 5

Ranking based on thirteen years average of EVA
(Top 5 Companies and Last 5 Companies)

ECONOMIC VALUE ADDED			
Top Five Companies	**Mean Value**	**Last Five Companies**	**Mean Value**
Bajaj Auto Ltd	516.17	Maruti Udyog Ltd	-34.63
Hero Honda Motors India Ltd	475.80	Kinetic Motor Company Ltd	-23.12
Mahindra and Mahindra Ltd	412.04	Majestic Auto Ltd	-5.70
Ashok Leyland Ltd	268.82	Kinetic Engineering Ltd	-2.34
Tata Motors Ltd	175.30	Scooters India Ltd	-0.97

Table 6

EVA and other independent variables – Model Summary (Whole Industry)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin- Watson
1.	.359[a]	.129	.096	513.56	
2.	.359[b]	.129	.100	512.36	
3.	.358[c]	.128	.104	511.24	
4.	.358[d]	.128	.108	510.13	
5.	.357[e]	.127	.111	509.15	2.314

a. **Predictors: (Constant), ROCE, MVA, ROS, MP, EPS, ROTA, PAT, SALES**
b. **Predictors: (Constant), MVA, ROS, MP, EPS, ROTA, PAT, SALES**
c. **Predictors: (Constant), MVA, ROS, EPS, ROTA, PAT, SALES**
d. **Predictors: (Constant), MVA, ROS, EPS, PAT, SALES**
e. **Predictors: (Constant), MVA, EPS, PAT, SALES**
f. **Dependent Variable: EVA**

 Source: Computed.

Table 7

EVA and other independent variables - ANOVA (Whole Industry)

Model		Sum of Squares	df	Mean Square	F	Sig.
1.	Regression	8252129.592	8	1031516.199	3.911	.000[a]
	Residual	5.592E7	212	263751.164		
	Total	6.417E7	220			
2.	Regression	8250290.477	7	1178612.925	4.490	.000[b]
	Residual	5.592E7	213	262521.530		
	Total	6.417E7	220			
3.	Regression	8233086.334	6	1372181.056	5.250	.000[c]
	Residual	5.593E7	214	261375.187		
	Total	6.417E7	220			
4.	Regression	8215444.796	5	1643088.959	6.314	.000[d]
	Residual	5.595E7	215	260241.542		
	Total	6.417E7	220			
5.	Regression	8172340.249	4	2043085.062	7.881	.000[e]
	Residual	5.600E7	216	259236.278		
	Total	6.417E7	220			

a.   **Predictors: (Constant), ROCE, MVA, ROS, MP, EPS, ROTA, PAT SALES**

b.   **Predictors: (Constant), MVA, ROS, MP, EPS, ROTA, PAT, SALES**

c.   **Predictors: (Constant), MVA, ROS, EPS, ROTA, PAT, SALES**

d.   **Predictors: (Constant), MVA, ROS, EPS, PAT, SALES**

e.   **Predictors: (Constant), MVA, EPS, PAT, SALES**

f.   **Dependent Variable: EVA**

  Source: Computed.

Table 8

EVA and other independent variables coefficients (Whole Industry)

Model		Unstandardized Coefficients		Standardized	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	111.023	45.582		2.436	.016
	EPS	1.903	.639	.217	2.976	.003
	SALES	-.038	.016	-.371	-2.441	.015
	PAT	.791	.198	.596	3.991	.000
	MP	-.053	.205	-.022	-.259	.796
	MVA	-.019	.011	-.144	-1.797	.074
	ROS	-.393	.921	-.029	-.426	.670
	ROTA	.333	1.402	0.018	.238	.812
	ROCE	.029	.351	.006	.084	.934
2.	(Constant)	110.861	45.434		2.440	.016
	EPS	1.906	.637	.217	2.993	.003
	SALES	-.038	.016	-.372	-2.448	.015
	PAT	.791	.198	.596	4.002	.000
	MP	-.052	.204	-.022	-.256	.798
	MVA	-.019	.011	-.144	-1.801	.073
	ROS	-.381	.909	-.028	-.420	.675
	ROTA	.377	1.298	.020	.290	.772
3.	(Constant)	105.492	40.215		2.623	.009
	EPS	1.916	.634	.219	3.021	.003
	SALES	-.039	.016	-.376	-2.498	.013
	PAT	.778	.190	.586	4.088	.000
	MVA	-.019	.011	-.144	-1.809	.072
	ROS	-.397	.905	-.029	-.439	.661
	ROTA	.334	1.284	.018	.260	.795
4.	(Constant)	105.040	40.090		2.620	.009
	EPS	1.949	.619	.222	3.148	.002
	SALES	-.039	.015	-.380	-2.550	.011
	PAT	.789	.185	.594	4.259	.000
	MVA	-.019	.011	-.145	-1.817	.071
	ROS	-.364	.893	-.026	-.407	.684
5.	(Constant)	103.908	39.916		2.603	.010
	EPS	1.913	.612	.218	3.128	.002
	SALES	-.039	.015	-374	-2.525	.012
	PAT	.779	.183	.586	4.250	.000
	MVA	-.019	.011	-.144	-1.817	.071

Dependent Variable: EVA

Source: Computed.