

EVA™ AND TRADITIONAL FINANCIAL MEASURE OF BUSINESS PERFORMANCE: A STUDY ON NSE LISTED AUTOMOBILE COMPANIES

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Abstract

In this article a study has been made to analyse empirically the relationship between Economic Value Added (EVA) based ranking and traditional performance indicator (namely, liquidity, profitability and efficiency ratios) based ranking. For this purpose, EVA of the select NSE listed automobile companies is calculated by making some necessary adjustments. It is observed that no single index can be formed with the help of traditional ratios. In this study, it has been found that profitability and efficiency ratios are positively correlated with the EVA, but liquidity has no impact on EVA. These findings establish that rankings based on EVA and rankings based on traditional measures (profitability and efficiency) are nearly the same.

Key words : Economic Value Added (EVA), Liquidity ratio, Profitability ratio and Efficiency ratio.

Introduction

An assessment of the financial performance is an important task for external users in order to evaluate the solvency and profitability position of a particular organization as well as for internal users in their formulation of strategy. Broadly, there are two approaches for the measurement of financial performance. The first approach is the traditional approach, which is merely based on simple notion of accounting profit and the relevant ratios derived from them. Accordingly, financial performance of any company in terms of profitability, liquidity and efficiency can be analyzed with the help of ratio analysis and a business unit may be regarded as a good or weak unit on the basis of some specified profitability, liquidity and efficiency ratios. The second approach, which is based on economic profit, is Economic Value Added (EVA).

The Stern Stewart & Co. of New York City popularized the concept of EVA as an ultimate measure of business performance. Bennett Stewart in his book “The Quest for Value” used the term EVA with a symbol™ as superscript, which is the normal practice of referring to any registered trademark. The EVA is actually Stern Stewart & Co.’s trademark for a specific method of calculating economic profit. EVA may simply be defined as a company’s net operating

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profits after tax and the weighted average cost of capital. Consequently, positive EVA of a company implies that the company is successful in creating value for the business by utilizing the scarce resource in most profitable way. On the other hand, its negative value implies that the company is a value destroyer. According to Stern, Stewart & Chew (1996), EVA is not just another performance measure, but can be the main part of an integrated financial management system, leading to decentralized decision making. Thus, the adoption of EVA should indirectly bring changes in management, which in turn can enhance a firm's value.

Several US companies (e.g. Coca Cola, AT & T, Briggs & Stratton, Quaker Oats etc.) that have adopted EVA as the basis of management performance measurement, have experienced a significant increase in their shareholders' wealth. But several academic empirical studies (e.g., Dodd and Chen, 1996; Biddle, Bowen and Wallace, 1997 etc.) have offered contradictory results regarding the superior informational content of EVA over the traditional measures of performance and the necessity for its application. However, there are a few empirical research studies in Indian context explaining the relationship between traditional performance indicators and EVA for the measurement of any company's performance.

Thus, the main aim of our study is to compare the EVA based performance approach and the traditional performance indicators of selected automobile companies listed in National Stock Exchange.

Brief Survey of Literature

Economic value added is a burning topic for measuring a firm's performance. The available literature of EVA may be classified broadly into six categories. These are concept of EVA and its different theoretical aspects, EVA and stock returns, relationship between EVA and Market Value Added (MVA), the relationship between managerial behaviour and EVA based performance management, the relationship between value based management and EVA and the relationship between EVA and discounting approaches. In this section, an attempt has been made to make a review of the existing literature on EVA according to the above mentioned classification.

• Concept of EVA and It's Different Theoretical Aspects

Under this sub-area we have considered those literatures which include the concept of EVA, implementation of EVA, its advantages and limitations. Stewart (1994) made an attempt in his paper to correct some of the practical and theoretical misconceptions regarding EVA. Ehrbar, Al (1999) has stated that EVA can help corporations to achieve remarkable success. Roztocki and Needy (1999) has examined the effectiveness of EVA as a tool for performance

measure of small manufacturing companies. Wet, D. (2001) has mainly explained the concept of EVA and focused on the necessary actions which are required for implementation of EVA. Bhattacharyya and Phani (2004) have investigated whether EVA can be used as a better tool for the purpose of corporate reporting and internal governance. Ray and Choudhuri (2005) have focused on the uses and limitations of EVA. Phillips, D. (2007) has opined that EVA sets high standards for measuring performance and based on the economic reality it has bitterly determined the company's worth in a better way than the traditional indicators. Cheremushkin (2008) has critically examined whether properly calculated EVA reflects better a firm's performance as compared with initial opportunity costs that existed when the capital was contributed.

• **Relationship Between EVA and Stock Returns**

There are a good number of studies that highlight that EVA is strongly correlated with the stock returns. Stern Stewart (1995), Lehn & Mukhija (1996), Lefkowitz (1999), Dodd and Chen (1996), Worthington and West (2004), Medeiros (2005), Maditinos et al. (2006), Kyriazis (2007) etc. have found a strong relationship between EVA and stock returns. Some researchers, such as, Bao and Bao (1998), Gravey and Todd (2000) etc. have found a mixed result. In this connection some scholars, such as, Biddle, Bowen and Wallace (1997), Krasner and Pushner (1997), Villersand Auret (1998), Birchard, etc. have also highlighted the limitations of EVA in explaining stock returns.

• **Relationship between EVA and MVA**

It has been stated by Stewart(1991) in the book 'Quest for value' that there is a strong correlation between EVA and MVA, which is based on the empirical research carried out on a sample of 613 American Companies comparing two periods, namely 1984-85 and 1987-88. Again Stewart (1994) has investigated the performance of 1000 largest American companies and reported that the change in EVA explains 50% changes in MVA, where as 10% change in MVA have been explained by the changes in sales. This hypothesis has also been supported by some researchers such as, Milunovich & Tseui (1996), O'Byrne(1996), Grant (1996), Peixoto(2002) etc. Some scholars [Kramer & Pushner, 1997; Fernandez, 2001; Wet, 2005; etc] are also of the view that there exists a better relationship between traditional measures and MVA than EVA.

• **Managerial Behaviour and EVA Based Performance Management**

An appropriate performance measure should assess how managerial actions affect the firm value. In this regard, some scholars [Stewart (1995); Biddle et al. (1998); Ferguson and

Leistikow (1998); Irala (2005); Desai and Ferri (2006);etc.] have opined that EVA is a better alternative to the traditional performance measures such as profits, EPS, and ROE etc.

• Value Based Management and EVA

Some researchers, such as, Teitelbaum (1997), Bacidere (1997), Bao and Bao (1999), Anand, Garg and Arora (1999), Banerjee (2001), Bora (2001), Chakraborty (2001), etc., have considered EVA as a management tool as well as a value based performance indicator.

• Discounting approaches and EVA

The use of DCF (Discounted-Cash-Flow) method for investment decision making and valuation is well entrenched in finance theory and practice. Dillon and Owers (1997) have analytically investigated the relationship between EVA and NPV. Shrieves and Wachowicz (2000) have investigated the relationship of free-cash flow (FCF) and EVA. In his entire study he found that the FCF approach focuses on the periodic total cash flows obtained by deducting total net investment and adding net debt issuance to net operating cash flow, whereas the EVA approach requires defining the periodic total investment in the firm. Some scholars, such as [Dillon & Owers, (1997); Velez-Pareja and Tham(2003);etc] are also of the same opinion.

In fact, to the best of our knowledge, most of the studies have been carried out mainly in developed countries, particularly in USA. In our study we like to compute the EVA of the selected Indian automobile companies and compare the ranking of companies on the basis of traditional measure with that of EVA.

Objectives of the Study

The objectives of our study are:

- (1) To compute EVA of the selected automobile NSE listed companies by making the necessary adjustment over the period of 2001-2012.
- (2) To calculate different ratios (namely, liquidity, profitability and efficiency) of those automobile companies during the study period 2001-2012.
- (3) To formulate rank of these select automobile companies on the basis of traditional performance indicators and EVA
- (4) To construct a single index on traditional performance indicator (say, liquidity, profitability and efficiency) and analyse their viability.

Database

In this study, eleven automobile companies (Ashok Leyland, Eicher Motors, Escorts, Hero

Motocorp, Hind.Motors, Kinetic Motor Co., LML, Mah. Scooters, M&M, Tata Motors, TVS Motor Co.) have been selected from total fourteen NSE listed automobile companies. Remaining three companies have been excluded from the data set because of their incomplete information. After elimination of these companies, the basic data on different financial variables, such as profit after tax, provision for taxation, interest paid, equity share capital, reserve and surplus, borrowings, closing share prices etc. have been collected from the sources like daily issues of Economic Times, Prowess of CMIE and Capital line software package over the last eleven years (i.e. from 1st April 2001 to 31st March, 2012).). Again the year end bank rate which is used as a proxy for risk free rate of return has been collected from the website of Reserve Bank of India. The bank rate varies from 6.5% to 9.5% during the study period.

Data Analysis and Interpretation

Sub-section I: In conformity with the objectives of our study, first of all we have to compute EVA of the select companies by making the necessary adjustments. For computing EVA, Stewart & Co. has made 164 necessary adjustments. However, in this study, EVA has been calculated by making ten necessary adjustments which are relevant in the Indian context as per the study of Gandhok et al. in the Business Today on 17th February, 2002 (<http://archives.digitaltoday.in/businesstoday/20020217/cover1.html>). The different important adjustments (namely, research and development, goodwill, interest, non interest bearing current liabilities, non-recurring income and expenditure, construction in progress, asset gain, cash-operating tax, investment in marketable securities and revaluation reserve) have been considered in our study for calculating EVA as per Indian GAAP.

The EVA has been computed in our study as: $EVA = NOPAT - (CE \times WACC)$; Where, NOPAT= Net operating profit after tax; CE= Capital employed; WACC= Weighted Average Cost of Capital;

WACC will be calculated on the basis of the following formula: $WACC = (E/CE) \times K_e + (P/CE) \times K_p + (D/CE) \times K_d$; Where, E= Closing equity share capital + Reserves and Surplus; P= Closing preference share capital; D= Total borrowings (i.e. Debt); K_d = cost of debt = $[\text{Interest on debt} \times (1-T)/\text{total borrowings}] \times 100$; T= Tax rate; K_p = cost of preference share capital = $(\text{preference dividend}/\text{preference share capital}) \times 100$; K_e = cost of equity = $R_f + (R_m - R_f) \beta_j$; R_f = risk free rate of return; R_m = expected return for market portfolio or market return; β_j = beta coefficient for the jth company according to CAPM.

The formula for calculating daily return from NSE nifty is:

$$\frac{\text{closing index of the day } N - \text{closing index of day } (N - 1)}{\text{closing index of day } N - 1} \times 100 \times 365$$

In this study, it has been found out that average yearly market return is 20.44% by making a simple average of a series of 2745 annualised daily return.

The value of beta for each of the select companies has been estimated by regressing company's stock return on the market return and it has been calculated as $\beta_{jm} = \text{Cov}_{jm} / \sigma_m^2$ where, Cov_{jm} is the covariance of stock return with index return and σ_m^2 is the variance of market return. We have next, found out year wise value of EVA by taking into account all the stated steps, during the study period 2001 to 2012 and these EVA figures are disclosed in Table -1.

Table -1
Estimated values of EVA of selected automobile companies

Company	Ashok Leyland	Eicher Motors	Escorts	Hero Motocorp	Hind Motors	Kinetic Motor Co	LML	Mah. Scooters	M&M	Tata Motors	TVS Motor Co.
2001-2002	-139.4	9.547	-132.42	66.686	-65.983	9.29996	-25.59	-12.337	-308.48	-904.73	-9.167
2002-2003	-111	6.4313	-209.73	415.72	-71.424	10.1284	-66.78	-11.536	-147.61	-360.09	-11.07
2003-2004	-67.89	20.418	-194.16	518.94	-58.761	7.99566	-58	-14.886	-180.02	-22.672	42.964
2004-2005	-12.62	2.0573	-452.66	662.73	-96.222	-4.9809	-44.79	-13.283	-19.575	364.194	22.961
2005-2006	42.458	18.144	-120.33	720.09	33.2634	-25.771	-88.79	-7.6483	101.13	725.976	1.1677
2006-2007	50.421	108.52	-219.84	691.68	-50.28	-46.42	-81.27	-4.6103	254.17	840.719	-36.94
2007-2008	69.875	-8.574	-268.83	575.27	-9.0926	-74.174	-12.06	-10.091	332.23	1059.67	-96.01
2008-2009	48.02	-14.379	-270.14	201.36	3.49098	-101.3	-1.14	-6.1321	202.06	1054.61	-133.3
2009-2010	-491	-28.097	-248.92	-3165.3	-57.955	102.005	13.54	-7.3762	-222.41	-518.73	-131.7
2010-2011	-295.6	-1.709	-269.95	-2501.9	-29.973	-1.6371	-15.39	-13.445	466.26	380.133	-107.9
2011-2012	-145.6	33.317	-337.41	1826	-34.852	-1.2346	-16.78	1.33842	530.3	-675.1	-6.239

Sub-section II: In order to examine whether the ranking based on the traditional measure are consistent with the EVA based ranking, the liquidity, efficiency and profitability position of selected automobile companies has been judged. The liquidity position of the company has been judged on the basis of current ratio and quick ratio. For measuring the efficiency of the company, net sales to total assets (NSTA) and net sales to net worth (NSNW) have been computed and to analyze the company's profitability position, three ratios, namely return on investment (ROI), earning per shares (EPS) and net profit to total assets (NPTA) have been considered in this study. Year wise and company wise these ratios are presented in Table -2, Table-3 and Table-4.

Table -2
Computed values of liquidity ratios of the select companies

Company	Ratio	Ashok Leyland	Eicher Motors	Escorts	Hero Motocorp	Hind. Motors	Kinetic Motor Co	LML	Mah. Scooters	M&M	Tata Motors	TVS Motor Co.
2001-2002	CR	2.89	1.35	1.52	0.85	1.59	1.66	1.43	1.3	1.85	1.06	1.59
	QR	1.93	0.89	1.3	0.41	0.9	0.84	0.86	1.1	1.25	0.63	0.95
2002-2003	CR	2.71	1.12	1.67	0.6	1.53	1.53	1.26	1	1.65	1	1.38
	QR	1.67	0.81	1.52	0.39	0.87	0.75	0.62	0.9	1.2	0.64	0.88
2003-2004	CR	2.26	1.06	1.92	0.43	1.56	2.24	1.13	0.9	1.47	0.85	1.02
	QR	1.57	0.73	1.71	0.25	0.76	1.24	0.58	0.8	1.06	0.52	0.53
2004-2005	CR	1.76	1.21	1.39	0.4	1.33	2.97	0.97	0.8	1.15	0.79	0.94
	QR	1.15	0.85	1.2	0.25	0.68	1.59	0.45	0.7	0.77	0.55	0.47
2005-2006	CR	1.85	1.11	1.24	0.37	1.08	2.02	0.88	0.6	1.31	1.08	1.01
	QR	1.36	0.75	1.05	0.23	0.72	1.29	0.51	0.5	0.87	0.84	0.55
2006-2007	CR	1.58	1.24	1.18	0.53	0.91	1.03	0.54	0.8	1.34	1.37	1.12
	QR	0.94	0.83	1	0.38	0.51	0.7	0.2	0.5	0.91	1.08	0.51
2007-2008	CR	1.54	1.15	1.32	0.62	1.19	0.78	0.49	0.5	1.41	1.36	1.31
	QR	0.93	0.83	1.11	0.43	0.71	0.49	0.18	0.5	1.08	1.04	0.68
2008-2009	CR	1.27	1.21	1.41	0.51	1.05	0.32	0.45	0.4	1.12	0.97	1.37
	QR	0.73	0.72	1.15	0.34	0.6	0.13	0.17	0.4	0.79	0.75	0.65
2009-2010	CR	1.48	1.38	0.97	0.49	0.87	0.29	0.45	0.9	1.06	0.88	1.44
	QR	0.86	1.22	0.74	0.33	0.42	0.27	0.19	0.9	0.84	0.67	0.93
2010-2011	CR	1.4	0.61	1.22	0.6	0.75	0.27	0.37	0.7	1.16	0.66	1.31
	QR	0.85	0.43	0.88	0.51	0.43	0.27	0.11	0.7	0.93	0.49	0.92
2011-2012	CR	1.24	0.62	1.28	0.24	0.81	0.26	0.38	0.6	0.91	0.87	1.12
	QR	0.61	0.41	0.94	0.16	0.4	0.27	0.12	0.6	0.66	0.63	0.63

Table -3
Computed values of efficiency ratios of the select companies

Company	Ratio	Ashok Leyland	Eicher Motors	Escorts	Hero Motocorp	Hind. Motors	Kinetic Motor Co	LML	Mah. Scooters	M&M	Tata Motors	TVS Motor Co.
2001-2002	NSTA	1.1	3.31	0.77	4.55	2.26	3.71	1.62	1.01	1.1	1.06	3.08
	NSNW	2.01	4.74	1.42	5.04	6.49	5.8	3.6	1.05	1.72	2.04	5.09
2002-2003	NSTA	1.21	4.26	0.67	5.56	1.86	4.02	1.46	0.59	1.13	1.53	3.94
	NSNW	2.3	6.72	1.39	6.51	5.96	5.34	3.91	0.62	2.19	2.96	5.97
2003-2004	NSTA	1.64	4.93	0.45	5.12	1.66	2.62	1.47	0.3	1.37	2.18	4.96
	NSNW	2.95	6.2	0.97	5.92	6.28	4.56	6.65	0.32	2.39	3.4	6.39
2004-2005	NSTA	2.22	3.57	0.74	4.44	1.74	1.95	3.05	0.18	1.97	2.66	4.06
	NSNW	3.35	7.3	2.28	5.12	12.8	3.8	30	0.19	2.8	3.59	4.91
2005-2006	NSTA	2.07	5.23	0.99	4.38	3.7	1.79	2.04	0.15	2.17	2.59	3.32
	NSNW	3.72	8.23	2.44	4.97	9.15	3.92	-15	0.16	3.34	4.16	4.24
2006-2007	NSTA	2.53	2.63	1.09	3.97	1.81	3.48	4.67	0.1	2.14	2.39	2.81
	NSNW	3.84	3.68	3.24	4.34	5.83	44.24	-1.9	0.11	2.8	3.68	4.22
2007-2008	NSTA	2.89	3.18	1.26	3.75	2.23	2.61	3.13	0.04	1.9	2.5	2.67
	NSNW	3.91	4.73	3.21	4.01	7.29	-4.32	-0.3	0.04	2.78	3.97	4.76
2008-2009	NSTA	2.61	3.32	1.22	3.31	2.71	-26.84	-4	0.01	1.63	2.02	2.16
	NSNW	3.73	4.8	2.71	3.46	5.76	-0.94	-0.4	0.01	2.6	3.65	3.92
2009-2010	NSTA	1.12	0.9	1.26	3.18	2.9	0.69	-2.4	0.01	1.39	0.99	2.14
	NSNW	2.89	0.97	1.58	3.24	7.57	-0.3	-0.5	0.01	2.46	2.06	4.53
2010-2011	NSTA	1.25	0.92	1.35	4.46	4.44	0.02	-2.5	0.02	1.72	1.11	2.33
	NSNW	3.17	0.96	1.64	4.55	19	-0.01	-0.8	0.02	2.35	2.34	5.04
2011-2012	NSTA	1.72	1.2	1.48	4.33	3.95	0.02	-2.4	0.03	1.81	1.32	3.46
	NSNW	4.28	1.23	1.84	6.51	21.2	-0.08	-0.7	0.03	2.24	2.36	6.18

Table -4
Computed values of profitability ratios of the select companies

Company	Ratio	Ashok Leyland	Eicher Motors	Escorts	Hero Motocorp	Hind. Motors	Kinetic Motor Co	LML	Mah. Scooters	M&M	Tata Motors	TVS Motor Co.
2001-2002	NPTA	4.3	20.1	0.95	35.79	-19.37	16.5	1.74	0.66	3.8	-7.85	10.66
	ROI	11.2	25.1	13.3	54.55	13.5	33.22	9.25	1.58	7.57	-0.14	17.71
	EPS	0.37	11.56	14.41	12.06	0.00	9.09	1.49	1.97	2.59	0.00	1.32
2002-2003	NPTA	4.84	16.5	-2.225	55.36	-6.354	18.18	-12	2.35	4.08	-0.17	11.08
	ROI	13	31.3	8.43	86.75	1.226	33.64	-1.5	2.54	6.87	6.422	20.49
	EPS	0.39	9.24	1.13	22.67	0.00	9.99	0.00	4.66	2.21	0.00	1.12
2003-2004	NPTA	7.38	29.7	-6.684	53.79	-5.585	11.56	-14	0.34	5.31	7.278	22.87
	ROI	16.1	49.6	9.66	89.05	2.746	21.92	-7.9	1.05	11.6	20.21	38.98
	EPS	0.47	18.28	3.20	26.78	0.00	9.15	0.00	0.22	2.96	1.72	2.73
2004-2005	NPTA	12.7	8.87	-16.63	49.56	-18.49	0.946	-12	0.99	12.9	17.33	19.89
	ROI	22.7	21.3	-19.13	81.78	-10.29	5.079	-2.7	2.09	20.7	30.82	32.4
	EPS	0.77	16.17	0.00	33.91	0.00	0.88	0.00	5.04	7.22	4.25	2.83
2005-2006	NPTA	12.2	15.8	-14.91	43.99	-21.68	-19.2	-39	3.37	16.6	18.35	12.76
	ROI	19	25.3	16.67	71.92	52.46	-19.2	-43	5.12	24.6	28.3	24.12
	EPS	1.07	20.39	4.33	37.75	3.04	0.00	0.00	8.99	11.01	6.28	2.81
2006-2007	NPTA	14.4	7.87	-1.282	40.84	-20.18	-78.5	-366	3.85	18	16.33	9.012
	ROI	23.7	34.7	11.52	64.47	-11.79	-65.3	-206	6.77	29.8	27.78	16.46
	EPS	1.25	76.65	2.63	45.84	0.00	0.00	0.00	11.68	17.63	7.28	2.37
2007-2008	NPTA	16.8	9.98	-0.08	29.49	-19.14	-94.4	-302	3.56	18.8	17.24	4.17
	ROI	25.2	16.6	6.178	47.35	10.28	-80.5	-199	5.19	27.8	27.11	8.726
	EPS	1.56	17.74	0.00	40.07	0.82	0.00	0.00	6.02	21.55	9.12	1.34
2008-2009	NPTA	14.8	9.56	0.084	28.2	-20.91	2359	217	4.59	13.7	12.41	0.204
	ROI	23.7	15.6	8.097	45.29	26.28	1905	130	6.12	21.6	21.3	3.148
	EPS	1.64	21.59	1.31	45.24	1.91	0.00	0.00	9.27	22.27	9.78	0.61
2009-2010	NPTA	3.29	11.3	4.797	30.43	-43.91	2.269	58.6	4.26	8.44	2.104	1.718
	ROI	9.07	9.62	11.35	45.99	-14.41	448.7	39.3	5.45	12.9	7.192	5.577
	EPS	0.63	28.96	9.72	60.79	0.00	46.32	0.00	8.60	15.30	3.76	0.60
2010-2011	NPTA	6.45	12.7	6.293	58.96	-66.41	-19.8	49.4	4.08	18.9	4.87	6.414
	ROI	14	21.5	12.17	80.25	-17	-23.5	39.9	3.19	28.1	12.92	8.109
	EPS	1.47	27.85	13.19	93.18	0.00	0.00	0.00	6.44	35.58	7.39	1.76
2011-2012	NPTA	9.51	18.1	5.805	41.42	-53.89	-17.5	52.6	10.1	20	5.3	11.54
	ROI	18.6	30.3	8.086	54.43	13.77	25.15	42.3	10	28.3	9.976	17.84
	EPS	2.21	46.00	11.49	79.51	0.05	0.00	0.00	17.55	43.69	5.10	3.92

Sub-section III: To examine whether the rankings of the companies based on EVA are consistent with their rankings based on the computed ratios, we require a single set of ranking. However, it is very difficult to construct a single set of ranking based on these three indicators as they do not move in the same direction.

To achieve this objective, during the study period ranks have been allotted to each ratio in descending order (i.e., rank 1 is given to the largest value), for the sample companies. The Spearman's rank correlation co-efficient have been calculated between each pair of the ratios. The estimated results of this yearly rank correlation coefficient are presented in the Table 5.

Table-5**Estimated Spearman's Rank correlation Coefficient between each group of ratios**

Year	CR and QR	ROI and EPS	EPS and NPTA	ROI and NPTA	NSTA and NSNW
2001-02	.618*	0.483	0.569*	.736**	0.818**
2002-03	.727**	0.761**	.807**	.936**	.955**
2003-04	.855**	0.811**	0.711**	.955**	.618*
2004-05	.882**	0.671*	.734**	.955**	.582*
2005-06	.945**	.661*	.747**	.655*	.864**
2006-07	.855**	.853**	.697**	.900**	0.245
2007-08	.873**	.844**	.908**	.936**	0.255
2008-09	.773**	-0.159	-0.105	.718**	.873**
2009-2010	.882**	.610*	0.392	.636*	.918**
2010-11	.791**	.560*	.523*	.955*	.927**
2011-12	.873**	0.15	0.424	.718**	.945**

Note: * implies significant at 1% level and ** indicate significant at 5% level.

From Table-5, it is observed that the estimated rank correlation coefficients are statistically significantly and positive in most of the cases as per expectation. Only in 2008-2009, correlation coefficients between ROI and EPS and EPS and NPTA indicate negative values.

Next, we have added the ranks of the concerned ratios (which are found significant in most of the cases) of each group and again allotted the ranks in descending order to construct a single set of ranking for each group of the ratios year wise during the study period (2001-2012).

After that, we have calculated the Kendall's coefficient of concordance (w) among the ranking of three ratios (say, liquidity, profitability and efficiency) and it is calculated by using the following

formula $W = \frac{s}{2k^2(N^3 - N)}$ which follows χ^2 distribution with degrees of freedom $n-1$. Here,

, R_j denotes the sum of ranking based on liquidity ratios, profitability ratios and efficiency ratios in any year for any company; K = no. of set of ranking; N = number of object ranked.

The yearwise computed Kendall's coefficient and χ^2 values are exhibited in Table 6.

Table-6
Computed values of Kendall's coefficient of concordance (w) and χ^2 values

Date	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012
W	0.3352	0.3602	0.2966	0.233	0.4375	0.3966	0.5068	0.2943	0.117	0.2352	0.2648
χ^2	13.4092	14.408	11.864	9.32	17.5	15.864	20.272	11.772	4.68	9.408	10.592

If the tabulated value is greater than calculated value, we accept the null hypothesis that all the ranking are independent, otherwise we reject the null hypothesis i.e. all the three performance indicators (liquidity, profitability and efficiency) are jointly and significantly associated. It is observed from Table 6 that all the calculated values of W are less than the tabulated values. Hence, we accept the null hypothesis and infer that the rankings are independent. For the above reason, we cannot construct a single index of the combined group (say, liquidity, profitability and efficiency).

Accordingly, we have examined the relationship between EVA based set of rankings and combined ranking of each group of ratios on liquidity, profitability and efficiency. Table -7 shows the Spearman's rank correlation coefficients between EVA based set of rankings and combined ranking of each group of ratios.

Table -7
Estimated Spearman's rank correlation coefficient between EVA and Broad group of ratios

Date	2001-2002	2002-2003	2003-2004	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012
Liquidity & EVA	-0.5	-0.35	-0.7	-0.4	-0.5	-0.1	0.3	0.1	-0.8	-0.2	-0.5	-0.6
Profitability & EVA	0.7*	0.56*	0.491**	0.71*	0.86*	0.76*	0.86*	0.8*	0.55*	0.09	-0.1	0.71*
Efficiency & EVA	0.38**	0.53*	0.6*	0.31**	0.38**	0.59*	0.06	0.4**	0.12	0.6*	-0.4	-0.1

Note: * implies significant at 1% level and ** implies significant at 5% level.

From the Table -7, it is observed that correlation coefficients between EVA and profitability are positive and mostly are statistically significant over the study period. In case of liquidity and EVA, there exists a negative relationship which is not statistically significant. This implies that liquidity and EVA is independent with each other. However, it is observed that EVA based ranking is positively (except the year 2010-2011 and 2011-2012) and significantly correlated with efficiency.

Conclusion

In our study, we have tried to measure the year wise EVA for each of the selected automobile companies by applying necessary adjustments which are relevant in Indian context. In the next step we have computed liquidity (current ratio and quick ratio), profitability (ROI, NPAT and EPS) and efficiency (NSTA and NSNW) ratios and have constructed a group wise single set of ranking (because in most of the cases these are positive and statistically significant).

However, it has been observed that no effective set of ranking could be formed because the ratios are not dependent on each other. Accordingly, we have examined whether the EVA based rankings are similar to ranking based on ratios say, liquidity, profitability and efficiency separately. From the empirical study, it has been found that the correlation between EVA with profitability and efficiency is positive and statistically significant, but liquidity has no impact on EVA for the sample companies. So we can conclude that information based on EVA is not different from the information based on profitability and efficiency ratios at least in case of our sample companies. To draw more accurate inference in this field, EVA can be computed by making more necessary adjustments on the basis of large number of companies in other industries.

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