VALUE-BASED MEASURES: AN EMPIRICAL STUDY IN THE INDIAN PHARMACEUTICAL INDUSTRY

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Introduction

Conventionally, the benchmarks used to measure the efficiency and profitability of a business firm were financial accounting based measures like ROI, ROCE, EPS, PBIT, PBDITA, Kp, Lp, PAT and ratios etc. With the passage of time and enforcement claims of academicians and practitioners value added measures are gaining popularity day by day. That is why value added measures are emerging as an alternate of the financial accounting based traditional measures. Mind it, at the same time there are numerous ways available to create the maximum value for shareholders. Companies can make a decision for excellence in operations that is closely related to the profitability. They can get their financial structure accurate, which is closest to free cash flow among the fundamental drivers. They can choose employee satisfaction that is associated most closely to profitability as more focused area. They can also create value through plausible earnings growth, which matches the fundamental driver of growth and many other ways are in put to create shareholder value.

The research issue arises from this assortment of different ways to create value. There is forever scope for creating value in companies and they avail themselves of value-creating advice. However, it is not enough to have strategies in place, there is call for some indicators to ensure whether value has been created or not. Thus the companies require to measure and make sure that they are being successful in creating value for shareholder. There is also a set of inventions and innovations that are intended to overcome the limitations of the traditional accounting framework, as seen from a 21st century perspective. This flow of new inventions to improve performance measurement system striking world business today, created the curiosity to investigate the measurement metric to be used nowadays within the companies so as to measure the ultimate shareholder value creation. This paper will cover the different valuation methods to be used by Indian pharmaceutical companies to measure shareholder value creation starting from traditional valuation measures to the most contemporary value based measures.

Superiority of Value Added Measures

While managers are feeling amplified pressure to deliver value, they often lack the necessary indicative tools. Moreover, they lack the language of value creation-that is, a means of persuading capital providers that funds will be productively and profitable employed in their business firms. Managers who fail in this assignment will find their business firms at a competitive disadvantage in the contest for global capital resources. They must learn to find the way the rough seas of competitive capital markets, or they will find themselves replaced by managers who can. Still, there is widespread confrontation, especially in Europe, to the idea that creating value for shareholders should be management's top priority. Value based management is frequently criticized on the grounds that is ignores important constituencies other than the firm's shareholder, such as employees, customers, suppliers, the environment, and local society. Yet a growing body of authentication in Europe and North America shows that business firms with good reputations in terms of (1) product and service quality, (2) the ability to catch the attention of, develop, and retain talented people, and (3) community and environmental responsibility be inclined to outperform stock market averages.

This authentication suggests that firms deliver to shareholders only when they deliver value to their constituencies. If customers are not satisfied, they will

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buy from competitors. If employees feel their talents are unrewarding and undervalued, they too go somewhere else. In its 1995 annual report, Coca-Cola, one of the world's top value creators, makes the claim: "Coca-Cola provides values to everybody who touches it". What the statement means is that every constituency that comes in contact with Coke and its products has somehow been enriched for the experience. Whether it is customers who take comfort from the brand, employees who work in an inspiring and concerning environment, traders (middleman) who enjoy attractive profit margins, or most important, shareholder who are wealthier because of the company's strong financial performance, everyone is better off because Coke exists. While this statement may seem egregiously arrogant, to some, it reflects and important philosophical attitude among Coke's managers. Their number one job is to create shareholder value, a task that is achieved only be delivering value to everyone else. Most business firms rely on a number of traditional measures like ROI, ROCE, EPS, PBIT, PBDITA, Kp, Lp, PAT, financial ratios, and other modern measures. These measures are available with varying benefits and serving a different purpose. The advantages and disadvantages of the various measures used for the study are discussed below. Such an understanding is indispensable to designing management systems-in the areas of performance measurement, incentive compensation, operating budgets, and internal and external communications-that promote the creation of shareholder value. What are the main differences each of these seven categories of performance metrics from the others is how they differ according to whether they:

1.   Are denominated in financial terms (e.g., Rupees) or in percentage terms

2.   Include the cost of debt

3.   Include the cost of equity

4.   Are measureable at divisional stage

5.   Are simple to calculate

6.   Include the value of prospect investments

7.   Traditional or modern measure

The main differences among 10 of the most important financial metrics used in the study are summarized in table 1:

It should be noted here that EVA is distinguished from other residual income measures as it is not bound by accounting principles. This distinction offers the potential advantage of producing more economically

Table 1

Showing Comparisons of important Financial Metrics

Measure	Rupees/ %	Includes cost of debt	Includes cost of equity	Measureable at divisional stage	Simplicity of calculation	Includes value of prospect investments	Traditional/ Modern
MVA	Rs	*	*	No	Medium	Yes	Modern
EVA	Rs	Yes	Yes	Yes	Low	No	Modern
EPS	Rs	No	No	No	High	No	Traditional
Kp	Rs	No	No	Yes	Medium	No	Traditional
Lp	Rs	No	No	Yes	Medium	No	Traditional
NPV	Rs	*	*	Yes	Medium	Yes	Traditional
PBIT	Rs	No	No	Yes	High	No	Traditional
PBDITA	Rs	No	No	Yes	High	No	Traditional
PAT	Rs	No	No	Yes	Medium	No	Traditional
ROCE	%	No	No	Yes	High	No	Traditional

*Capital costs are not explicitly included in market-based measures but are reflected indirectly.

valid figures, but at the cost of added computational complexity. The most important drawback of NPV (Net present Value) method, that managers in high NPV divisions turn down value-creating projects because they don't want to decrease the overall NPV of the business firm without considering the circumstances in which investment is to be made. Similarly, Kp (capital productivity) and Lp (labour productivity) are the valuable traditional financial measures only for under-developed and developing nations. Because in these types of nations there is wide spread debates whether capital intensive or labour intensive technique is useful to increase Gross Domestic Product (GDP) of the nation. Market based measures like MVA have the important advantage that they incorporate market expectations of future growth and are easy to calculate. Their drawback is that they can only be measured for publicly traded entities and therefore are unusable at divisional levels. Traditional financial accounting based measures, such as EPS, PBDITA, PBIT, PAT and ROCE have the important virtue that they are already available through the normal reporting process. If not available then, any common man calculates these measures easily. But, the increasing rate of return of all these measures does not ensure the increasing rate of return to shareholders or in the form of value creation.

1.2 Pharmaceutical Industry and its Importance

Pharmaceutical industry in India is playing a vital role in the healthcare area of the nation with 14% annual growth rate. The year 1995 recorded landmark for the Indian pharmaceutical industry as India became a signatory to World Trade Related Intellectual Property Rights (TRIPS). Further after this period tariff and non-tariff measures have come downward. Such developments have worked in act of kindness of Indian pharmaceutical industry to undertake activities such as clinical research and new drug development. Indigenous producers dominated the market accounting for more than 70% of the market share. Exports also continued to increase now days, because of strong process R&D and low manufacturing cost. Indian pharmaceutical

industry ranks 4th in terms of volume and 13th in terms of value. The industry produces about 60,000 finished medicines and roughly 400 bulk drugs, which are used in formulations. A decade of economic reforms has tested the flexibility of the Indian pharma industry. Due to its low cost infrastructure, India has potential of growth in exports also has the capability for major value added being close to Middle East. This is the cheap and abundant source for expansion of Indian pharma industry. But, India ranks very low in the global health scenario; both in terms of status and expenditure over 50% of young children in the country are malnourished. Only 35% of the country's population has access to essential drugs. Reason attributed to this is that India invests only 5% of its GDP on health (Agrawal, Dua, Garg, Sara, and Taneja, 2004).

1.0 Review of Previous Studies

The present section briefly throws light on the researches carried out so far by the scholars actively engaged in the field. In Indian context also, there are numerous studies for introducing, advocating, refining and criticizing the value added measures. The studies have been appraised and summed up in the following paragraphs in their sequential order.

Sakthivel (2011) analyzed the trend and growth of shareholders' value in terms of EVA and MVA of Indian pharmaceutical industry. On the basis of study of 15 Indian pharmaceutical companies he concluded that pharmaceutical industry has succeeded to meet public expectation in terms of shareholders' value creation through EVA either by increasing operating income from assets in place through reducing cost of production or increasing sales, or reducing the cost of capital by changing the financial mix in capital structure.

Pal, Soriya and Sura (2011) presented the association and inter-relationship among Value Added Intellectual Co-efficient (VAIC), Economic Value Added (EVA) and Market Value Added (MVA) of Indian banking industry. By analyzing thirty seven Indian banks they found that intellectual capital that is measured by both VAIC and EVA to be associated with MVA. Further, EVA was more closely associated and it means that

economic value added may be considered as the better utilization of intellectual capital of the banks.

Kanthakrishana and Jeyaraj (2010) carried out a study on the performance of EVA by taking twenty Indian companies from different industries. The study reveals that all select companies have positive EVA. Because EVA were in absolute figures, comparison had been made keeping EVA to CE ratio as external benchmark. Further, they conclude that EVA has the advantage of being conceptually simple and easy to explain to non-financial managers, since it starts with familiar operating profits and simply deducts a charge for the capital invested in the company as a whole, in a business unit or even in a single plant, office or assembly line.

Lee and Kim (2009) compared incremental descriptive power of six firm performance measures: three EVA related performance measures (i.e. EVA, REVA and MVA) and three traditional accounting performance measure (i.e., CFO, ROA and ROE) on the market adjusted return, controlled for firm size. The study makes aid, not only by introducing a modified EVA version (i.e. REVA), but also by investigating separately, the three hospitality sub-sectors (i.e., hotel, restaurant and casino). General findings of the study described that EVA does not emerge to be as a good firm performance measure as otherwise thought.

Burksaitiene (2009) showed the conceptual equivalence between EVA and NPV approaches to valuation and decision making. He concluded that both NPV and EVA are connected to shareholder value and the use of both these approaches may be successful tools in fact to create value for investors. Both approaches show that value is created only if the company can earn in excess of investors required returns when measured by the cost of capital.

Ptetravicius and Tamosiuniene (2008) compared the four measures (MVA, EVA, CVA and CFROI) by the way they integrate the idea of shareholder value, their elasticity in application to the valuation of companies and the measurement of financial performance. They found that value based methods

promote the maximization of the economic worth of an organization by allocating its assets to their finest use.

Fountaine, Jordan and Phillips (2008) explored whether economic value added can be used to produce two portfolios with statistically different cumulative returns. The analysis is done using a portfolio separation test that examines the statistical significance of the regression coefficient generated when the cumulative returns from one portfolio are regressed alongside the cumulative returns from the other portfolio. They used the Stern Stewart database to seem at firms' EVA performance for each year from 1995 to 2005. Each firm's EVA is divided by its average book value of long-term debt and equity. This is done in order to adjust for extent effects on EVA. They conclude that EVA does offer economically useful information that can be used to forecast portfolio separation.

Modesti (2007) compared two valuation criteria i.e. NPV and EVA from a mathematical point of analysis. The main difference is not in the formulas, but in their interpretation. One can start from a NPV and rot in quotas. EVA starts from periods results (often the firm net operating profit after tax) and sums them up, reaching the universal value. The decomposition of NPV, starting from global results does not seem to propose using accounting data (as EVA does). Yet it is enough to decompose NPV with balance-sheet values as exceptional capitals to find EVA.

Philips (2007) found that anyone can benefit from applying EVA. It is the structure for a complete financial management and incentive compensation system that can guide every decision a company makes, from the boardroom to the shop floor, that can transform a corporate culture; that can pick up the working lives of everyone in an organization by making them more victorious; and that can help them produce better wealth for shareholders, customers and themselves. It helps business leaders focus on and prioritize what really needs to be done to create wealth and helps investors and stakeholders determine whether or not a company is subsequent through with its mandate of

creating shareholder value.

Grant and Trahan (2007) presented a framework for classifying acquiring firms into wealth creators and wealth destroyers. They found that 1) wealth creating firm (previous positive EVA) do not create value through tactical acquisition; although they appear to destroy the least amount of shareholder value, 2) wealth destroying firms (previous negative EVA) destroy value via corporate acquisitions; although a stock market irregularity seems present in the pricing of restructuring acquires that are trying to turn a negative EVA situation around and 3) varying degrees of shorting (and longing) opportunities on large strategic acquirers (and targets) are potentially economically accessible to active investors using the EVA style of analysis.

Mironiuc (2006) compared the traditional accounting concepts with modern value based measures. Under traditional concepts the value of shareholder capital was represented by the value of the net capital that is the difference between the total assets and debts, which is a traditional notion. The modern financial outlook considers the value of stakeholder's capital is being represented by the value of economic capital, i.e., the updated figure of the benefits the company has to grant to its shareholders.

Rakshit Debdas (2006) point out that performance measurement systems that were successful in the past are becoming outdated and in some cases are dysfunctional and disruptive to improvements. A dynamic and more competitive environment requires dynamic benchmarks to get a clear picture of whether the firm is a value creator or a value destroyer. The EVA based performance measurement system is the basis on which the company should take suitable decisions related to the choice of strategy, capital allocation, merger & acquisitions, divesting business and goal setting. While deciding resource allocation it becomes essential to appreciate the EVA impact of such decision.

Maditinos, Sevic and Theriou (2006) introduced the concept of economic value added (EVA) in the Greek context and to provide an explanation on the utilization of both earnings and EVA in the ASE. The study interprets results obtained from an analysis carried out on the basis of secondary financial data relating to the period 1995-2001. Both relative and incremental context approaches have been tested. Relative information context tests revealed that stock returns are more directly associated with EPS than EVA. On the other hand, incremental information content tests provide evidence that EVA adds noteworthy explanatory power to EPS in explaining stock returns.

Paula and Elena (2006) checked the excellence of EVA as a performance measure to stimulate management and employees in any company due to its highest correlation with MVA, the theoretically definitive performance measure and EVA adopting companies' superior performance compared with peer non-EVA adopting companies. The consequences based on the data of companies listed for the period from 1994 to 2004 revealed that year- to-year basis; EVA did not show the strongest correlation with MVA. Another interesting finding of the study was the insignificant correlation between MVA and EPS and DPS.

Wet De JHVH (2005) investigated the strength of the relationship between EVA and other traditional accounting measures relative to market value added (MVA), and to compare the findings with these of studies already published elsewhere. The data from South African listed companies for a period of ten years (1995-2004) was used for this purpose. He found that EVA did not show the strongest correlation with MVA. However, of the performance indicators selected for the study the change in the standardized cash flow from operations (CFL) explained the biggest percentage of change in standardized MVA (38%). ROA comes second best (15%) and standardized EVA (8%) third.

Ismail (2005) identified the relationship between economic value added (EVA) and the company performance in Malaysia. It also sought to explain the ability of EVA, compared to traditional tool, in measuring performance under various economic

conditions. For this purpose the sample of the companies comprise most of the companies Listed in Bursa Malaysia over the period 1993-2002. This study discovered that traditional tools have a better relationship with the stock return than EVA before the crisis period. However, during economic crisis in 1997 and 1998 EVA had an improved relationship with the stock return than conventional tools. After the crises period, none of the performance tools had a relationship with the stock return. In summary, he concluded that EVA had an improved relationship with stock return than traditional tools.

Kukreja and Giridhar (2005) evaluated the financial performance of select companies in the pharmaceutical industry by using a variety of new breed value-based performance measures. They have calculated correlation of 115 Indian firms to see which metric is more correlated with Market Value Added a measure of external performance which is considered to be the most excellent indicator of shareholder value creation. In this study they have proved that companies perform well on appropriate value based performance metrics are concerned are sufficiently rewarded by the capital markets. Correlation studies reveal that holds the key for the pharmaceutical industry in Future Growth Value (FGV). A company in order to improve its FGV must give up complacency, invest in intangibles and mobilize people.

Bhattacharyya and Phani (2004) revealed that the concept of EVA is based on the sound economic principal that firm value increases only if it is smart to generate surplus over its cost of capital and therefore it is based on strong theoretical groundwork. They analyzed the 100 top Indian manufacturing sector companies and 100 top multinational companies operating in India. They explained the concept of Economic value Added (EVA) that is gaining reputation in India. However the attractiveness of EVA has tempted the companies to report EVA as a public relation measure, even if such reporting is confusing.

3.0 Need of the Study

The pharmaceutical industry is doing extraordinarily well

and is registering high growth rates for the past few years. Maximizing shareholder value is becoming the new corporate benchmark in India. The corporate, who gave low preference to the shareholder curiosity, are now bestowing the paramount inclination to it. In order to help the corporate to generate value for the shareholders, value-based management system has been developed. If a business enterprise is determined to maximize the economic value of the shareholders claim to the assets, then it is fairly beyond price to all those who are patronized stakeholders. Creating value is the central part principle on which the economic system is based. Moreover, value added financial measures used in this paper represent the wealth created by a business firm during a specified period because a firm that fails to create value to its shareholder may also fail to survives. Hence, value added measures are fundamental measures which may be used for measuring the financial performance of a business firm. In the context of an impressive performance by the pharmaceutical industry and in order to examine the worth of value added financial measures, the present paper intends to investigate the inter-relationship between values based measures and traditional financial variables.

3.1 Problem Statement

Indian markets are beginning to the reality that several business firms are doing something similar, using capital incompetently and destroying value. International markets, too, appear at value creating when it comes to sizing up of a company. The corporate actions have undergone an inherent change in the modern time and the use of traditional financial variables to explain the shareholder value creation is not an appropriate move onward. Further, in the changing corporate environment, the time has come to look at relationship between financial variables and stock prices in a different way. As the corporate most vital objective at this moment is to maximize shareholder value, establishing a relationship between the financial variables and the corporate objectives are very important for survival. To reach this objective, the present study intends to examine the inter-relationship

between shareholder's value and financial variables. The market based measure market value added (MVA) is considered as dependent variable. Residual Income measures viz., economic value added (EVA) and; traditional valuation measures viz., earnings per share (EPS), capital productivity (Kp), labour productivity (Lp), net present value (NPV) profit before interest and tax (PBIT), profit before depreciation, interest, taxes and amortization (PBDITA) and return on capital employed (ROCE) have been considered as independent variables. For carrying out the study, the following specific objectives have been set for the study:

1. To examine whether the data of select financial variables used for sample pharmaceutical companies is symmetrical.

2. To study the relationship between select independent variables and market value added (MVA) of sample Indian pharmaceutical industry for the time period of 1998-99 to 2009-10.

3.2 Hypothesis of the Study

In harmonization with the above-mentioned objectives, the study intends to test the following null-hypothesis (H_{0S}):

H_{01}: The distribution is asymmetrical for study variables under consideration (MVA, EVA, EPS, Kp, Lp, NPV, PBIT, PBDITA, PAT and ROCE).

H_{02}: Market Value Added (MVA) of Indian pharmaceutical companies is not influenced by independent financial variables like EVA, EPS, Kp, Lp, NPV, PBIT, PBDITA, PAT and ROCE.

3.3 Data Analysis and Methodology

The data for the study was obtained primarily from most worthy CMIE (Centre for Monitoring Indian Economy) database "PROWESS" From 1st April 1998 to the 31st March 2010 of twelve financial years and supplemented with data from other published sources like annual reports, business journals and magazines. Data as regards economic indicators was obtained from the handbook of Indian statistics. Further many online sources like www.rbi.com, www.nseindia.com & www.inidastat.com also has

been used for this study.

3.4 Sampling Procedure

Pharmaceuticals companies listed on national stock exchange (NSE) as on 24 Dec. 2010 were taken for the purpose of analysis. At initial stage 77 NSE listed pharma companies were considered, further due to non-availability of complete financial information for the study period of three companies i.e. Yogi Healthcare Ltd., Piramal Life Sciences Ltd. and Datt Medi products Ltd. could not be undertaken. Ultimately 74 pharmaceutical companies selected for the further study.

3.5 Normality Through Data Transformation

According to Osborne (2002), many statistical procedures (like Regression, ANOVA and t-test) assume that the variables are normally distributed. A significant violation of the assumption of normality can seriously increase the chances of the researcher committing either a Type I or II error. There are multiple options for dealing with non-normal data but data transformation is one of the best available solutions. Data transformation is the re-expression of data on a new scale using mathematical modification to the values. In this paper, Logarithmic (Log x_i base i.e.10) has been used for avoiding the problem of non-normality. After transforming the data normality has been checked by Kolmogorov-Smirnov one sample test.

3.6 Data Analysis Tools

In order to derive the open handed results from the information collected through secondary data, multiple regression have been accomplished through EXCEL and SPSS (14.0) software. To avoid the problem of multicollinearity, the step-wise method of multiple regressions has been used in this study.

3.7 Limitations and Future Scope of the Study

The data used for the study have been taken from CMIE (Centre for Monitoring Indian Economy) database "PROWESS". The reliability of this database may be challenged on different grounds. The study considered only seventy four pharma companies operating in India. The analysis is almost based on past

PAT	Kolmogorov-Smirnov Z	0.710	0.735	0.868	0.668	0.563	0.480	0.757	0.811	0.515	0.592	0.898	0.812
	Asymp. Sig. (2-tailed)	0.694	0.652	0.439	0.764	0.909	0.975	0.616	0.526	0.953	0.875	0.396	0.525
ROCE	Kolmogorov-Smirnov Z	1.023	1.353	1.080	1.042	1.346	0.538	0.723	0.636	1.117	0.663	1.170	1.028
	Asymp. Sig. (2-tailed)	0.246	0.051	0.194	0.228	0.053	0.934	0.673	0.814	0.165	0.771	0.129	0.242

4.2 Descriptive Statistics

After satisfying the assumption of normality table 3 put forward the descriptive statistics of select pharmaceutical companies. The descriptive statistics so presented in the table is calculated by using average data (company wise) of all the ten select variables of 74 sample pharmaceutical companies from 1999 to 2010. It may be observed that MVA are ranging from -1.022 to 4.05 with an average of 2.3502. Similarly EVA values are varying from -0.801 to 4.51 with an average of 3.2085; EPS show a inconsistency from -1.183 to 3.09 with an average of 1.0399; Kp ranging from -1.34 to 6.123 with an average of 0.0945; Lp fluctuate from -1.499 to 10.722 with an average of 0.8137; NPV vary from -1.49 to 3.27 with an average of -0.0171; PBIT vary from -0.815 to 2.75 with an average of 1.6066; PBDITA fluctuate from -1.57 to 4.37 with a mean of 1.6559; PAT fluctuate from -0.662 to 2.83 with a mean of 1.3695 and ROCE fluctuate from -3.079 to 14.714 with a mean of 1.0201.

Analysis

To gain further insights Table 4&5 carries out a continuous cross-sectional regression analysis over the period 1999-2010 for sample pharmaceutical companies. According to Fama and French (1997) the advantages of the cross-sectional analysis is that it takes in to account a large sample which, well increase the precision of the slope and reduce the year by year volatility. To avoid the problem of multi collinearity Step-Wise method of multiple regression has been applied. Table 4 depicts that coefficient of determination (R^2) fluctuate from 0.542 to 0.998. The values of R^2

Table 3

Descriptive Statistics of Sample Pharmaceutical Companies (Average Data)

STATISTICS	MVA	EVA	EPS	Kp	Lp	NPV	PBIT	PBDITA	PAT	ROCE
Mean	2.3502	3.2085	1.0399	0.0945	0.8137	-0.0171	1.6066	1.6559	1.3695	1.0201
Std. Deviation	0.90097	0.71386	0.53030	0.49655	0.25274	0.80293	0.57608	0.66027	0.69564	0.42565
Variance	0.812	0.510	0.281	0.247	0.064	0.645	0.332	0.436	0.484	0.181
Skewness	0.000	-0.076	-1.183	1.168	-1.499	0.157	0.110	-1.453	-0.156	-3.079
Kurtosis	-1.022	-.801	1.973	6.123	10.722	-0.579	-0.815	6.686	-0.662	14.714
Minimum	0.74	1.90	-0.91	-1.34	-0.53	-1.49	0.52	-1.57	-0.17	-1.37
Maximum	4.05	4.51	2.18	2.40	1.57	1.78	2.75	2.80	2.66	1.56
Range	3.32	2.62	3.09	3.74	2.10	3.27	2.23	4.37	2.83	2.93
N	59	34	68	74	74	72	70	72	66	66

are the indication of the worthiness of the model. Profit after tax (PAT), Profit before interest & taxes (PBIT) and Profit before depreciation, interest taxes and amortization (PBDITA) are emerged as most significant predictor by the analysis. Our findings are also consistent with several prior studies done by Kramer and Pushner (1997:41), Biddle's et. at (1999:69), Keef and Roush (2002:20) and Ramezani, Soenen and Jung (2002:56). In 1999 EPS predicts 54.9% variation of the independent variable. But, in 2000 EVA predicts

90%; in 2001 PBDITA predicts 70.8%; in 2002 EVA predicts 54.2%; in 2003 PAT predicts 88.8%; in 2004 PAT again predicts 86.9%; in 2005 PBDITA & EPS predicts 89.8%; in 2006 PBDITA, PBIT & PAT predicts 94.7%; in 2007 PAT predicts 90.5% ; in 2008 PBIT predicts 84.3%; in 2009 PAT, PBIT, NPV & PBDITA predicts 99.8% and in 2010 PBIT & Kp predicts 92.2% variation of the dependent variable i.e. Market Value Added (MVA). Further it can be seen that Durbin Watson (D.W.) shows the level of autocorrelation in variables values are fluctuating in-between of 1.56 to 2.212. D.W. values are said to be significant because, according to the conservative rule value less than 1 and greater than 3 raise alarm bells

(Andy Field, 2004, p-146). Ultimately the results of the models shows that the indicator of shareholder wealth i.e. MVA of sample companies is surely influenced by PAT, PBIT, PBDITA, EPS and EVA. Hence second hypothesis (H_{02}) that Market Value Added (MVA) of Indian pharmaceutical companies is not influenced by independent financial variables like EVA, EPS, Kp, Lp, NPV, PBIT, PBDITA, PAT and ROCE is being rejected on the basis of findings of the study.

To know about the explanatory power of each of the variables forming part of finally selected regression model, a reference can be made from table 5, which offers following interesting findings. First,

Table 4

Model Summary and F-Ratio of Select Indian Pharmaceutical Companies

Year	Predictor (Constant)	Model	R	R^2	Adjusted R^2	Std. Error of the Estimate	R^2 Change	Durbin-waston	F	p-value
1999	EPS	1	0.741(a)	0.549	0.529	7.85378	0.549	1.756	27.998	0.000(a)
2000	EVA	1	0.949(a)	0.900	0.883	0.30823	0.900	1.560	53.999	0.000(a)
2001	PBDITA	1	0.841(a)	0.708	0.679	0.37641	0.708	2.212	24.249	0.001(a)
2002	EVA	1	0.736(a)	0.542	0.500	0.71729	0.542	2.003	13.004	0.004(a)
2003	PAT	1	0.942(a)	0.888	0.880	0.41069	0.888	2.068	103.365	0.000(a)
2004	PAT	1	0.932(a)	0.869	0.855	0.18150	0.869	1.695	59.785	0.000(a)
2005	PBDITA	1	0.913(a)	0.833	0.820	0.43967	0.833	-	64.735	0.000(a)
	PBDITA, EPS	2	0.948(b)	0.898	0.881	0.35678	0.066	2.022	53.026	0.000(b)
2006	PBDITA	1	0.943(a)	0.890	0.883	.26423	0.890	-	121.399	0.000(a)
	PBDITA, PBIT	2	0.960(b)	0.921	0.910	0.23123	0.031	-	82.053	0.000(b)
	PBDITA, PBIT, PAT	3	0.973(c)	0.947	0.935	0.19616	0.026	2.015	78.165	0.000(c)
2007	PAT	1	0.951(a)	0.905	0.897	0.26255	0.905	2.106	113.765	0.000(a)
2008	PBIT	1	0.918(a)	0.843	0.831	0.34271	0.843	1.737	69.685	0.000(a)
2009	PAT	1	.966(a)	0.932	0.921	.19856	0.932	-	82.499	0.000(a)
	PAT, PBIT	2	0.986(b)	0.972	0.961	.13952	0.040	-	87.128	0.000(b)
	PAT, PBIT, NPV	3	0.996(c)	0.991	0.985	0.08783	0.019	-	149.441	0.000(c)
	PAT,PBIT, NPV,PBDITA	4	0.999(d)	0.998	0.996	0.04521	0.007	-	426.038	0.000(d)
	PBIT,NPV, PBDITA	5	0.999(e)	0.998	0.997	0.03937	0.000	2.067	749.192	0.000(e)
2010	PBIT	1	0.840(a)	0.705	0.646	0.89685	0.705	-	11.948	0.018(a)
	PBIT, Kp	2	0.960(b)	0.922	0.883	0.51658	0.217	2.017	23.542	0.006(b)

Table 5

Regression Coefficients of Finally Selected Models of Indian Pharmaceutical Industry

Years	Model	Variables	Unstandardized Coefficients		Standardized Coefficients	t-value	p-value	VIF
			B	**Std. Error**	**Beta**			
1999	1	(Constant)	0.319	1.993		0.160	0.874	
		EPS	3.199	0.605	0.741	5.291	0.000	1.000
2000	1	(Constant)	-1.740	0.591		-2.946	0.026	
		EVA	1.461	0.199	0.949	7.348	0.000	1.000
2001	1	(Constant)	-0.110	0.497		-0.222	0.829	
		PBDITA	1.515	0.308	0.841	4.924	0.001	1.000
2002	1	(Constant)	-0.842	0.920		-0.914	0.380	
		EVA	0.941	0.261	0.736	3.606	0.004	1.000
2003	1	(Constant)	-0.348	0.254		-1.370	0.194	
		PAT	1.547	0.152	0.942	10.167	0.000	1.000
2004	1	(Constant)	-0.486	0.443		-1.096	0.302	
		PAT	1.695	0.219	0.932	7.732	0.000	1.000
2005	1	(Constant)	0.139	0.317		0.439	0.668	
		PBDITA	1.343	0.167	0.913	8.046	0.000	1.000
	2	(Constant)	0.310	0.264		1.173	0.264	
		PBDITA	1.574	0.159	1.069	9.909	0.000	1.375
		EPS	-0.487	0.175	-0.300	-2.782	0.017	1.375
2006	1	(Constant)	-0.096	0.262		-0.364	0.721	
		PBDITA	1.481	0.134	0.943	11.018	0.000	1.000
	2	(Constant)	-0.431	0.270		-1.596	0.133	
		PBDITA	1.030	0.224	0.656	4.598	0.000	3.628
		PBIT	0.547	0.231	0.337	2.364	0.033	3.628
	3	(Constant)	0.305	0.369		0.826	0.424	
		PBDITA	-0.780	0.737	-0.497	-1.058	0.309	9.630
		PBIT	0.790	0.218	0.488	3.619	0.003	4.497
		PAT	1.322	0.520	1.041	2.541	0.025	8.541
	4	(Constant)	0.010	0.243		0.041	0.968	
		PBIT	0.647	0.172	0.399	3.765	0.002	2.759
		PAT	0.790	0.135	0.622	5.867	0.000	2.759
2007	1	(Constant)	0.557	0.240		2.317	0.039	
		PAT	1.222	0.115	0.951	10.666	0.000	1.000
2008	1	(Constant)	1.912	0.168		11.366	0.000	
		PBIT	4.902	0.587	0.918	8.348	0.000	1.000
2009	1	(Constant)	0.115	0.353		0.325	0.756	
		PAT	1.342	0.148	0.966	9.083	0.000	1.000
	2	(Constant)	-0.521	0.344		-1.517	0.190	
		PAT	1.920	0.240	1.382	8.005	0.000	5.339
		PBIT	-2.621	0.980	-0.462	-2.675	0.044	5.339
	3	(Constant)	-0.735	0.228		-3.219	0.032	
		PAT	1.920	0.151	1.382	12.720	0.000	5.339
		PBIT	-1.970	0.656	-0.347	-3.004	0.040	6.030
		NPV	-0.332	0.113	-0.180	-2.935	0.043	1.694
	4	(Constant)	-2.974	0.654		-4.545	0.020	
		PAT	0.096	0.530	0.069	0.181	0.868	9.570
		PBIT	-5.297	1.014	-0.933	-5.222	0.014	9.489
		NPV	-0.410	0.062	-.0222	-6.572	0.007	1.947
		PBDITA	2.924	0.841	1.886	3.478	0.040	10.209
	5	(Constant)	-3.086	0.178		-17.331	0.000	
		PBIT	-5.461	0.400	-0.962	-13.647	0.000	9.181
		NPV	-0.414	0.051	-0.224	-8.156	0.001	1.700
		PBDITA	3.075	0.107	1.984	28.658	0.000	9.787
2010	1	(Constant)	-1.312	1.237		-1.060	0.337	
		PBIT	15.065	4.358	0.840	3.457	0.018	1.000
	2	(Constant)	-2.667	0.821		-3.249	0.031	
		PBIT	19.122	2.791	1.066	6.852	0.002	1.236
		Kp	2.009	0.604	0.518	3.327	0.029	1.236

Note: Dependent Variable MVA

Profit after tax (PAT) Profit before interest & taxes (PBIT) and profit before depreciation, interest, taxes and amortization (PBDITA) are emerged as highly selected independent variables to explain the dependent

variable MVA through out the study period. The unstandardized coefficient beta values (â) of PAT are fluctuating in-between of.096 to 1.920. T-test values of the independent variables used in this study are almost significant. So, the forgoing discussion reveals that PAT having highly explanatory power followed by PBIT, PBDITA, EVA, EPS, Kp and NPV. The values of variance inflationary factor (VIF) are mostly less than 10 indicate that collinearity does not exist between the explanatory variables.

5.0 Conclusion

Our study indicates that there is no strong evidence to support Stern Stewart claim that EVA is superior to the traditional performance measures in its relationship with MVA. Accounting data based performance measures like PAT, PBIT and PBDITA better explains MVA. PAT emerged as a relatively better explanatory variable. PAT stand first by showing higher R^2, then PBIT & PBDITA are second best and EVA & EPS are the third best measures on the basis of our study. Our findings are also consistent with several prior studies. On the basis of these findings results may say to be reliable for sample pharmaceutical companies. Thus, modern value added measures are seems to be unjustified and costly. In other words, one can continue using the conventional accounting items for performance evaluation. The study clearly demonstrates that market responds to the accounting numbers more than that with the numbers which are created using some adjustments so one should be careful in overusing the EVA as a proxy for MVA. Thus there is no clear evidence to support the claim that the shareholders stand to gain by looking at EVA. However, the usefulness of EVA for decision-making cannot be ruled out based on our study.

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