EVA AND CONVENTIONAL CORPORATE PERFORMANCE MEASURES: AN EMPIRICAL STUDY OF INDIAN COMPANIES

A THESIS

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CANDIDATE DECLARATION

I hereby certify that the work which is being presented in the thesis entitled **"EVA AND CONVENTIONAL CORPORATE PERFORMANCE MEASURES: AN EMPIRICAL STUDY OF INDIAN COMPANIES"** in partial fulfilment of the requirements for the award of the degree of Doctor of Philosophy and submitted in the Department of Management Studies of the Indian Institute of Technology Roorkee, Roorkee is an authentic record of my own research carried out during a period from August 2008 to August 2011 under the supervision of Dr. Anil K. Sharma, Associate Professor, Department of Management Studies, Indian Institute of Technology Roorkee, Roorkee.

The research presented in this thesis has not been submitted by me for the award of any other degree of this or any other institute.

Satish Kumar

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This is to certify that the above statement made by the candidate is correct to the best of my knowledge.

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ABSTRACT

The past two decades have witnessed a remarkable change in the way businesses run and operate. Increasing complexities in the financial markets along with globalization, technological revolution, ownership concentration patterns and accountability have become the crucial forces for the transformed corporate climate. Today, academics, researchers, business professionals, and stock market analysts widely agree that maximizing shareholder value is the most central financial objective of a business organization. However, usually divergent opinions exist as to how this value can be identified, measured, and ultimately optimized.

Companies around the globe are under great pressure not only to adapt to this new climate, but also to perform consistently well in all markets in which they compete. If companies fail to perform, they will either be forced to go bankrupt or will have to face the threat of being taken over by the competitors as happened recently in many advanced markets like USA and Europe. A large number of traditional financial performance measures have been developed to measure the corporate financial performance systems. These measures are often criticized for excluding a firm's cost of capital, and are considered inappropriate to be used when evaluating value creation. Furthermore, it is argued that these measures are based on accounting information, which could be distorted by Generally Accepted Accounting Principles (GAAP). Studies investigating the relationship between these measures and shareholders' value also provide conflicting results. As a result of the perceived limitations of traditional measures, value based financial performance measures have been developed. The major difference between the traditional and value based measures is that the value based measures include a firm's cost of capital in their calculation. They also attempt to remove some of the accounting distortions resulting from GAAP.

EVA is a value based financial performance measure that most accurately reflects company's true profit (Stewart, 1991). EVA is calculated after deducting the cost of equity capital and debt from the operating profits. EVA is a revised version of Residual Income (RI) with a difference the way the Economic Profit and the Economic Capital are calculated. Coined and popularized by New York based management consultancy firm Stern Stewart & Co. in 1991, EVA over the years has gained popularity as a reliable measure of corporate performance. In the later years, the concept has received recognition and support from various corporate houses; those adopted it as an internal control measure. The selling point

of EVA is that it considers Economic Profits and Economic Capital in order to know the value created and destroyed by an organization during a particular period. Economic profit and Economic Capital is calculated by making certain adjustments into the accounting profits.

Nevertheless, despite the growing amount of literature that has attempted to evaluate the claims made about EVA's superiority, little empirical research has so far been done to support the hypothesis that EVA better explains the firm value as compared to traditional performance measures especially in emerging market like India. Moreover, the limited studies that have appeared in the literature have produced somewhat conflicting conclusions. This conflicting evidence thus necessitates further studies that may provide better insight and understanding into this complex, yet crucial relationship between shareholder wealth creation and EVA. In this thesis, an attempt has been made to examine the efficacy of EVA and conventional corporate performance in Indian market both at aggregate and disaggregate (industry) level and find out which among these measures is a better predicator of firm value in Indian companies.

The information content of the traditional measures and the value based measures are evaluated by employing an approach developed by Biddle *et al.*, 1995, 1997; Dodd and Chen, 1997; Chen & Dodd, 2001; Elali, 2006; Ismail, 2006; Erasmus, 2008; Lee and Kim, 2009. The first phase of this approach entails the evaluation of information content of the EVA and traditional performance measures at aggregate level in order to determine which measure explains the largest portion of a contemporaneous MVA. The information content of the components of EVA is then analyzed in order to determine whether component unique to EVA contribute greater than that contained in the other components. The second phase consists of an evaluation of EVA and traditional measures at industry level and ranks these measures in order to find out whether EVA or conventional performance measures is most reliable predicator of MVA. The present study is conducted for 996 Indian non-financial firms listed on the Bombay Stock Exchange for the period 2000 to 2009. The methodology used in the present study is panel data regression model (fixed effects).

The results of this study indicate that the value based measure i.e. EVA is not able to outperform traditional measures in the relative information content test. Earnings Per Share (EPS) outperforms EVA in explaining the changes in the MVA of sample companies at aggregate level during 2000-2009. Furthermore, the component analysis of EVA indicates that although the component has some value relevance beyond that of conventional measures but the level of significance for these relatively complex adjustments is generally low. Another finding of the study concludes that relatively simple value based measure RI outperforms EVA. It indicates that if a firm intends to incorporate its cost of capital in its financial performance measures, the measure RI provides most of the benefits contained in the other more complex value based measures.

Disaggregate analysis indicates that there exists significance difference in the performance of various measures across industries. The majority of the industries are able to create value for shareholders during the study period 2000-2009. Examination of the efficacy of EVA and conventional performance measures indicates that Net Income (NI), Net Operating Profit After Tax (NOPAT) and Cash Flows From Operation (OCF) are top three measures in predicting the changes in the contemporaneous MVA of sample Indian industries during the study period. Thereby concluding that conventional measures are superior to EVA and the claims made by the proponents of the value based measures cannot be supported.

Overall results of the present study refute the claim of EVA superiority in explaining the MVA of Indian companies as compared to traditional measures during 2000-2009. Also relatively low explanatory powers of all the measures examined in the present study suggest that 59% of the variation appears to be attributable to non-earnings based information. Financial measures are only able to explain 41 percent of the variation in the MVA of the Indian companies during the study period. This suggests that if firms desire to more closely align performance measures with firm value, a measurement paradigm other than financial measures will have to be developed and investors must take into consideration non- financial variables such as customer satisfaction, research & development spending, productivity, product quality, employee satisfaction, community satisfaction, information technology and market share growth measures among few in corporate valuation.

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ABBREVIATIONS

ACC	Accruals
ADJ	Adjustments or Accounting Adjustments
AEE	Abnormal Economic Earning
ANOVA	Analysis of Variance
ARONW	Adjusted Return On Net Worth
ASE	Athens Stock Exchange (Greece)
ATI	After Tax Interest
BCG	Boston Consulting Group (USA)
BPR	Business Process Reengineering
BSE	Bombay Stock Exchange (India)
BT	Business Today (India)
CA	Current Assets
CAPM	Capital Assets Pricing Model
CE	Capital Employed
CEM	Common Effects Models (Regression)
CFROI	Cash Flow Return on Investment
COC	Cost of Capital
COCE	Cost of Capital Employed
COT	Cash Operating Taxes
COV	Current Operations Value
CVA	Cash Value Added
DFL	Degree of Financial Leverage
DJIA	Dow Jones Industrial Average(USA)
DOL	Degree of Operating Leverage
DPS	Dividend Per Share
DVs	Dependent Variables
EAT	Earnings After Tax
EBEI	Earnings Before Extraordinary Items
EBIT	Earnings Before Interest and Tax
EBITDA	Earnings Before Interest , Taxes, Depreciation and Amortization
EBM	Expectation - Based Management
EC	Economic Capital
EP	Economic Profit
EPS	Earnings Per Share
ESOP	Employee Stock Option Plan
EVA	Economic Value Added
FCF	Free Cash Flow
FEM	Fixed Effects Model (Regression)
FFM	Fama -French Model
FGV	Future Growth Value
FTSE	Financial Times Stock Exchange (UK)
GAAP	Generally Accepted Accounting Principles
GDP	Gross Domestic Product

GMM	Generalized Method of Moments (Regression)
HUL	Hindustan Unilever Limited
IEPM	Integrated EVA Performance Measurement Model
IIP	Index of Industrial Production
IRR	Internal Rate of Return
IVs	Independent Variables
JSE	Johannesburg Stock Exchange (South Africa)
KM	Knowledge Management
KP	Capital Productivity
LIFO	Last In , First Out
LP	Labour Productivity
MBV	Market to Book Value (Ratio)
MCA	Ministry of Corporate Affairs (India)
MSCI	Morgan Stanley Capital International
MVA	Market Value Added
NFA	Net Fixed Assets
NI	Net Income
NIBCLs	Non- Interest Bearing Current Liabilities
NOP	Net Operating Profit
NOPAT	Net Operating Profits After Tax
NP	Net Profit
NPM	Net Profit Margin
NPV	Net Present Value
NRE	Non- Recurring Expenses
NSE	National Stock Exchange (India)
NW	Net Worth
OFC	Cash Flow From Operations
OLS	Ordinary Least Squares (Regression)
OPM	Operating Profit margin
PAT	Profit After Tax
PBIT	Profit Before Interest and Tax
PE	Price Earning
PM	Performance Measurement or Management
R&D	Research and Development
RBI	Reserve Bank of India
RCF	Residual Cash Flow
REM	Random- Effect Model (Regression)
REVA	Refined Economic Value Added
RFR	Risk Free Return
RI	Residual Income
ROC	Return On Capital
ROCE	Return On Capital Employed
ROE	Return On Equity
ROI	Return On Investment
ROIC	Return On Invested Capital
RONW	Return On Net Worth

ROTA	Return On Total Assets
RR	Revaluation Reserve
S&P	Standard & Poor's (USA)
SENSEX	Sensitivity Index (India)
SHV	Shareholders Value
SLM	Straight Line Method
SS	Stern Stewart & Company (USA)
STK	Stock Returns
SVA	Shareholder Value Added
TIC	Total Invested Capital
TSR	Total Shareholders Return
TVA	True Value Added
VA	Value Added
VBM	Value Based Management
WACC	Weighted Average Cost of Capital

CHAPTER 1
INTRODUCTION & PROBLEM STATEMENT

CHAPTER 1
INTRODUCTION AND PROBLEM STATEMENT

1.1 INTRODUCTION

Traditional methods of assessing profitability are being questioned in relation to their relevance to creating wealth for shareholders. Notably, traditional accounting profit does not take into account opportunity cost and the risk to shareholders investments. In order to overcome the limitations of Generally Accepted Accounting Principles (GAAP), Stern Stewart & Company developed the concept of Economic Value Added (EVA). EVA is Net Operating Profit After Tax (NOPAT) minus an appropriate charge for the opportunity cost of all the capital invested in a company. EVA more accurately reflects the economic reality as opposed to the accounting reality.

The association between corporate financial performance measures and shareholders' value creation has become an issue of considerable academic and practitioner interest. Economic Value Added (EVA) is among the few value-based performance metrics that have been widely adopted and discussed, and are claimed to approximate shareholder returns. In fact, EVA is promoted by its proponents as being preferable or *'superior'* to other traditional and non-traditional performance metrics in determining corporate success and value creation (e.g., Stewart, 1991; Ehrbar, 1998; Fabozzi and Grant, 2000; Grant, 2003). Nevertheless, despite the growing academic and practitioner literature that attempts to evaluate the claims made about EVA's superiority, little empirical research has so far been done to support the above assertions. Moreover, the few studies that have appeared in the literature have produced somewhat inconsistent conclusions. For instance, Biddle *et al.*, 1997; Chen and Dodd, 1997; Stark and Thomas, 1998 have mostly not been supportive of these claims. On the other hand, Tully, 1993 & 1997; Lehn and Makhija, 1996 &1997; Zafiris and Bayldon, 1999; Young and O'Byrne, 2001; Grant, 2003; Feltham *et al.*, 2004; Worthington and West, 2004; and Elali (2006) have made contributions that favor EVA on theoretical and/or empirical grounds.

The inconclusive and mixed results of these studies raise an important question: *is EVA really superior to other alternative performance measures or is it merely a fad promoted by a management consultant firm?* This conflicting evidence thus necessitates the conducting of further studies that may provide better insight and understanding into this complex, yet crucial relationship between shareholder wealth creation and EVA.

1.2 THE RESEARCH QUESTIONS

This study is primarily intended to examine the efficacy of EVA and conventional performance measures in explaining the contemporaneous Market Value Added (MVA) in Indian market. It further aims to test which among the both- value based measurement i.e. EVA or conventional accounting based corporate performance measures is better predictor of Market Value Added (MVA) of Indian companies both at aggregate and industry level. In order to achieve this following research questions are empirically examined and analyzed:-

1. Does a statistical relationship between EVA and shareholder wealth exist, and if it does, how much of the variation of the shareholder value (as measured by MVA) of Indian companies can be explained by EVA?
2. Does EVA dominate traditional performance measures such as ROCE, RONW, EPS, NOPAT, NI, OCF and RI in explaining contemporaneous MVA of Indian companies?
3. Do components unique to EVA helps in explaining contemporaneous MVA beyond the explanation given by other components?
4. Does EVA or traditional performance measures such as ROCE, RONW, EPS, NOPAT, NI, OCF and RI dominate in explaining contemporaneous MVA among different Indian industries?

1.3 RESEARCH BACKGROUND

1.3.1 Changing Objective of the Firm and Role of Performance Measures

Modern finance theory hypothesizes that the objective of managerial decision-making should be to maximize firm's value[1]. Managers and practitioners have often criticized it for being too single minded about value maximization and for not considering the broader aspects of corporate strategy or the interests of other stakeholders. In the last two decades, however, managers seem to have come around to the view that value maximization should be, if not the only, should be at least one of the primary objectives for their firms. This turn-around can be partly attributed to the frustration that many of them have felt with strategic consulting and its failures, or partly to an increase in their ownership of equity in the firms that they manage. An established fact is that the primary role of managers is to maximize the wealth of shareholders by the efficient allocation of resources.

In order to operationalise this objective, shareholders wealth is traditionally proxied by either standard accounting magnitudes (such as profits, earnings and cash flows from operations) or financial statement ratios (including earnings per share and the returns on assets, investment and equity). This financial statement information is then used by managers, shareholders and other interested parties to assess current firm performance and also used by these same stakeholders to predict future performance. Further, under the semi-strong form of the efficient market hypothesis[2], the publicly available information contained in these variables is readily interpreted by the market, and thereby incorporated into future stock prices. Unfortunately, the empirical literature to date suggests that there is no single accounting- based measure upon which one can rely to explain changes in shareholders wealth[3]. For years, investors and corporate managers have been seeking a timely and reliable measurement of shareholders wealth. With such a measure, investors could spot *over* or *under* priced stocks, lenders could gauge the security of their loans and managers could monitor the profitability of their factories, divisions and firms.

Performance measurement systems were developed as a means of monitoring and maintaining organizational control, which is the process of ensuring that an organization aims at strategies that lead to the achievement of its overall goals and objectives. Performance measures, the key tools for performance measurement systems, play a vital role in every organization as they are often viewed as forward-looking indicators that assist management to predict a company's economic performance and many times reveal the need for possible changes in operations. Corporate financial valuation is one of the fast growing areas in the field of finance in post liberalized scenario. However, the choice of performance measures is one of the most critical challenges facing organizations. Poorly chosen performance measures routinely create the wrong signals for managers, leading to poor decisions and undesirable results (Maditions *et al.*, 2006). There are enormous hidden costs in misused performance measures. Shareholders pay the bill each day in the form of overinvestment and acquisitions that do not pay off. It is not that management is poor. Simply, it is the wrongly chosen performance measures, which in turn push management to take improper decisions[4].

1.3.2 Traditional Corporate Financial Performance Measures

Over the last few years, an increasing number of consultants, corporate executives, institutional investors and scholars have taken part in the debate on what exactly is the most appropriate way to measure performance. Consultants are willing to demonstrate the mastery of their recommended performance models. Corporate executives show clearly that the performance models adopted by their corporations are the most appropriate and successful models. Institutional investors debate the advantages of alternative performance models for screening underperforming companies in their portfolios. Finally, scholars develop performance measurement models and test the extent to which existing performance evaluation and incentive compensation systems inspire management decisions and performance itself [5]. There are various methods to measure corporate performance measures which can broadly be categorized as conventional or traditional performance measures and value based measures. This section gives a brief overview of various traditional performance measures. Detailed description of various performance measures is presented in Chapter 3 of the study.

Traditional performance measures, also known as earnings based measures - includes Earnings Per Share (EPS), Return On Net Worth (RONW), Return On Capital Employed (ROCE), Net Operating Profit After Tax (NOPAT). EPS is a measurement of company's per share performance. It is the ratio of net income to the number of shares outstanding. EPS is a relative measure as it considers the size of the capital (in form of number of shareholders). EPS, however, does not consider the cost of capital invested to generate the profits (Irala, 2005). NOPAT is an absolute measure of performance as it neither considers the full cost (cost of equity and debt) nor the size of capital employed to generate the given profit. So obvious problem with NOPAT is that two companies can never be directly compared based on their profits and hence the performance of their managers. ROCE is ratio of Net Operating Profit to the Net Operating Assets or Capital. The most widely cited performance measures are Return on Investments ratios, including the ROCE and RONW. Generally, higher returns ratios are associated with better performance. An advantage of using returns ratios in evaluating companies' performance is the ease of calculation. All information necessary for calculation is readily available, either from financial statements or from market data. And since, the return is expressed as a percentage of the investment, its interpretation is straightforward (Fabozzi and Grant, 2000). But Return on Investment measures is not good measures of performance for a number of reasons. Fabozzi and Grant (2000) further mentioned following four shortcomings of these ratios:

First, the return on investment ratios are formed using financial statement data in the numerator and/or the denominator and therefore the ratios are sensitive to the choice of accounting methods. This sensitivity to accounting methods makes it difficult to compare return ratios across companies and across time, requiring an adjustment of the accounting data to place return ratio on the same basis[6].

Second, return on investment ratios are backward-looking, not forward looking. Though the immediate effects of current investments influence the return ratios, the expected future benefits from current period decisions are generally not incorporated in the return ratios.

Third reason of deficiency of these ratios is that they fail to consider risk as they use historical financial statements data that in no way reflect the uncertainty the firm faces. *Finally*, the Return On Investment ratios do not adjust for controllable versus non-controllable factors. Return ratios simply reflect the bottom line and do not consider any other factors.

An appropriate performance measure must incorporate at least three things: (a) amount of capital invested (b) the return earned on the capital and (c) cost of capital (WACC) - reflecting the risk adjusted required rate of return. Table 1.1 presents a comparison of profits, EPS, ROCE and RONW across the above three parameters. From Table 1.1, it can be observed that traditional measures fails to incorporate the Cost of Capital Employed (WACC) thereby cannot be considered appropriate measures of firm financial performance. This leads to the development of a financial performance matrix that overcomes the limitation of conventional performance measures and focuses on true value added/destroyed by the organization.

Table 1.1 Comparison of different traditional performance systems

Performance Measures	**Computation includes**		
	Returns	**Capital Employed (CE)**	**Cost of CE**
Profits	Yes	No	No
EPS	Yes	Yes	No
ROCE	Yes	Yes	No
RONW	Yes	Yes	No

Source: Irala, L.R (2005)

1.3.3 Rationale Behind Value Based Measures (VBM)

The idea that the chief responsibility of managers is to increase company's value, gained importance and became widely accepted after the Rappaport's (1986) publication of *Creating Shareholder Value*. Moreover, accounting earnings were under attack due to their limitations. Rappaport (1981; 1986; 1998) argued that earnings fail to measure the real change in economic value. Arguments, such as *alternative accounting methods that could be used, the investment requirements exclusion of the calculation of profits and ignorance of the time value for money, brought earnings under hard criticism.*

Traditional performance measurement systems were developed at a time when decision-making was focused at the center of the organization and responsibilities for decision-making were very clearly defined. According to Knight (1998, p.173) 'these performance measurement systems were designed to measure accountability to confirm that people *met their budget* and followed orders'. However, during the last two decades it was widely argued that most of the performance measurement systems failed to capture and encourage a corporation's strategy, producing mostly poor information leading to wrong decisions. They are often criticized for not taking into consideration the *total cost of capital and for being unduly influenced by accrual-based accounting conventions* .VBM approach, based mainly on NPV techniques, Free Cash Flow, and Cost of Capital, have its main objective the maximization of shareholder value. Value-based management emerged from the discipline of strategic management in the late 1970's. Interest in value-based methods reflected disenchantment with traditional accounting earnings, although the objectives of each are different. Value-based management recognized that accounting data was no longer providing a robust insight into business performance. Value-based methods are based on the concept that the underlying financial performance of a business is best represented by the change in its economic value. That is, the change in the net present value of its expected future cash flows.

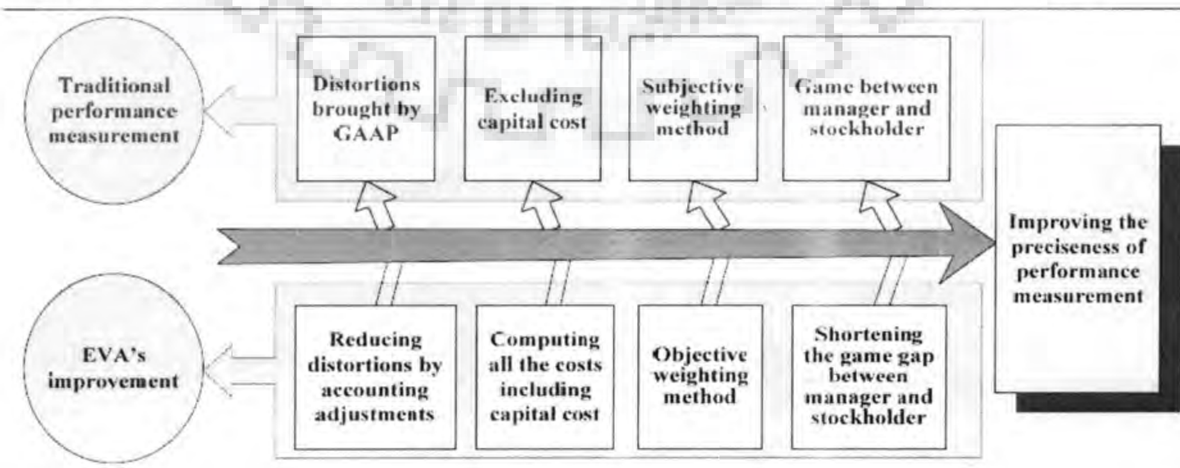
To overcome problems associated with earnings-based measures, several scholars proposed alternative theories and new (modern) performance measures. As a consequence, the shareholder value approach was developed in the late 1980s and early 1990s. Shareholder value approach estimates the economic value of an investment by discounting forecasted cash flows by the cost of capital (Rappaport, 1998, p. 32). Proponents of shareholder value approach, either academics or consulting firms, grounded their analysis on Free Cash Flows (FCF) and the cost of capital and produced a variety of such measures. The most common referred variants of those measures are: (a) Shareholder Value Added (SVA) by Rappaport and LEK / Alcar Consulting group (Rappaport, 1986, 1998) (b) Cash Flow Return On Investment (CFROI®) by Boston Consulting Group (BCG) and HOLT Value Associates (Black *et al.*, 1998; Madden, 1999; Barker, 2001), (c) Cash Value Added (CVA) by Boston Consulting Group (BCG) and the Swedes Ottoson and Weissenrieder (Ottoson and Weissenrieder, 1996; Madden, 1999; Barker, 2001), and (d) Economic Value Added (EVA®)[7] by Stern Stewart & Co. (Stewart 1991; 1999; Ehrbar, 1998; 1999; Stern, 2001).

One such model in the field of internal and external performance measurement is a trade-marked variant of residual income known as EVA® (Economic Value-Added). EVA is financial performance measure that most accurately reflects company's true profit (Stewart, 1991). EVA is calculated after deducting the cost of equity capital and debt from the operating profits. EVA is a revised version of Residual Income (RI) with a difference the way Economic Profit and Economic Capital are calculated. Coined and popularized by New York based management consultancy firm Stern Stewart & Co. in 1991, EVA over the years has gained popularity as a reliable measure of corporate performance. In the later years, the concept has received recognition and support from various corporate houses those adopted it as an internal control measure. The selling point of EVA is that it considers Economic Profits and Economic Capital in order to know the value created and destroyed by an organization during a particular period. Economic Profit and Economic Capital is calculated by making certain adjustments into the accounting profits.

As a starting point, its developer and principal advocate, USA based business consultants Stern Stewart and Company argue that *"earnings, Earnings Per Share, and earnings growth are misleading measures of corporate performance, the best practical periodic performance measure is Economic Value Added. EVA is the financial performance measure that comes closer than any other to capturing the true economic profit of an enterprise. EVA is a performance measure most directly linked to the creation of shareholders wealth over time"*[8].

Support from EVA has also come from Fortune[9]. Fortune has called it *"today's hottest financial idea", "the real key to wealth creation"* and *"A new way to find bargains"*. Drucker (1995) in the Harvard Business Review suggest that EVA's growing popularity reflects, amongst other things the demand of the information age for a measurement of the total factor productivity. Finally, there has been wide spread adoption of the EVA by the security analyst to value the securities[10]. Figure 1.1 present the difference between traditional financial performance measures and EVA and it clearly reflects that EVA is a superior measure as it improves the preciseness of performance measurement system by removing the deficiencies of traditional performance measures.

Figure 1.1 Difference between traditional financial performance measures and EVA



Source: Lin and Zhilin (2008a)

1.4 LINK BETWEEN CORPORATE PERFORMANCE MEASURES AND SHAREHOLDER VALUE CREATION

The link between performance measures and shareholders' value creation has become an issue of considerable academic and practitioner interest. As discussed above shareholders wealth is traditionally assessed by either standard accounting magnitudes such as profits, earnings and cash flows from operations or financial statements ratios such as: Earnings Per Share, Return On Assets or Return On Capital Employed. This financial statement information is then used by managers, shareholders and other stakeholders to assess current company performance. The empirical literature to date indicates that there is no single accounting-based measure which can be relied upon to explain changes in shareholder wealth. Should such a measure exist, it would prove invaluable to the various parties interested in aspects of company performance (Worthington & West, 2001).

Academic researchers, corporate executives, and business analysts have engaged in a rather heated debate in the last decade or so as to whether the new value-based performance metrics have a higher correlation with stock values and their returns than do other traditional accounting-based measures[11]. Economic Value Added (EVA), the Residual Income remaining after all costs, including the opportunity cost of the equity capital employed, is among the few performance metrics that have been widely adopted and are claimed to approximate shareholders returns. In fact EVA is promoted by its proponents as being superior to other traditional and non-traditional performance metrics as a determinant and predictor of corporate success and value creation (Stewart, 1991; Ehrbar, 1998).

Nevertheless, despite the growing amount of literature that has attempted to evaluate the claims made about EVA's superiority, little empirical research has so far been done to support the above assertions (e. g., Ittner & Larcker, 1998, Lehn and Makhija, 1997, Lovata and Costigan, 2002; Yook, 1999 and Feltham *et al*., 2004). Moreover, the limited studies that have appeared in the literature have produced somewhat conflicting conclusions. For instance, Olsen, 1996; Peterson and Peterson, 1996; Biddle ***et al***., 1997; Chen and Dodd, 1997& 2001; De Villiers and Auret, 1997; Kramer and Pushner, 1997; Bao and Bao, 1998; Clinton & Chen, 1998; Ferguson and Leistikow, 1998; Stark and Thomas,1998; Farsio *et al*., 2000; Kramer and Peters, 2001; Ray, 2001; Fernandez, 2002; Peixoto, 2002; Paulo, 2003; Sparling & Turvey, 2003; Ismail, 2006; Kim, 2006; Maditions *et al*., 2006 & 2009; Palliam, 2006; Lee and Kim, 2009; Kyriazis and Anastassis, 2007; Shubita, 2010; ArabSalehi & Mahmoodi, 2011 etc. have mostly not been supportive of EVA superiority over traditional measures.

On the other hand, Walbert,1994; Grant,1996 & 2003; Lehn and Makhija,1996,1997; Milunovich and Tsuei, 1996 ; O'Byrne, 1996 &1997 ; Uyemura *et al.,* 1996; Bacidore *et al.*, 1997; Zafiris and Bayldon, 1999; Thenmozhi, 2000;Young and O'Byrne, 2001; Dastgir and Izadinia, 2004; Worthington and West, 2004; Feltham *et al.*, 2004; Forker and Powell, 2004; Ferguson *et al.*, 2005; Erasmus and Lambrechts, 2006 ; Elali, 2006; and Irala , 2007 etc. have made contributions that favor EVA on theoretical and/or empirical grounds.

This conflicting evidence thus necessitates further studies that may provide better insight and understanding into this complex, yet crucial relationship between shareholder wealth creation and EVA. To further this idea, Lovata and Costigan (2002, p. 226) stated, "*Economic Value Added is a concept that requires much additional research to support or contest the claims of its developers*". Likewise, Feltham *et al.* (2004, p. 83) suggests that the *debate should be reopened regarding whether EVA has greater relevance than other performance measures.*

1.5 RATIONALE OF STUDY

Proponents of value based measures like EVA, MVA etc. argue that traditional measures do not measure the value created or destroyed by companies because of accounting distortions and not considering the full cost of capital while computing the value added by the companies for shareholders. They provided empirical evidences and established the hypothesis that EVA is superior measure than conventional performance measures which is not tested in emerging market particularly in India. There is scope to conduct a study in emerging market and provide empirical validity of the Stern -Stewart hypotheses (popularly known as SS hypothesis) and thus motivate researcher to examine the SS assertion in Indian context.

Relationship between EVA and market value of equity suggest that EVA affects the market value of the shares. Many studies have been conducted in developed countries that support this argument. To evaluate whether such kind of relationship exists in Indian Market or not, the present study has great significance.

Further most researchers on the efficacy of various corporate financial performance measures till date have tended to concentrate on either cross-sectional data or panel data with a relatively smaller time period. Examination of EVA and other accounting measures over a longer time frame would establish greater empirical certainty of these corporate financial performance measures and thus provide justification of conducting study.

Lastly, due to recent surge in investment activities in Indian capital market, it is not hard to imagine that investors are relying on accounting or earning based measures for their investment decision. But these measures do not provide correct valuation of the company. EVA although is a theoretically well-established measure but there is a need to establish empirical validity of EVA to be used as proxy of corporate performance measures in Indian market so that investor can use EVA for investment decision. Ministry of Corporate Affairs has decided to revise Schedule VI to the Company Act 1956 (Schedule VI stipulates the manner in which every company prepares and presents its balance sheet and profit and loss account)[12] and therefore one can expect increased numbers of EVA related information about Indian companies. So it is good an idea to provide empirical data about potential usefulness of EVA to be used as mandatory corporate performance reporting in India. Therefore, present study attempts to analyze the performance and discusses the effectiveness of various conventional corporate performance measures along with value added performance measure i.e. EVA on the sample Indian companies at both aggregate and disaggregate level.

1.6 SCOPE OF THE STUDY

The importance of defining the scope of study is in limiting the investigations to the basic issues and in maintaining a structured focused approach all through the study. The following are the broad areas of investigation that constitute the scope of study:

1. The investigation in the present study is limited to non-financial companies listed on Indian stock exchanges.
2. The study analyses the sample companies and rank their performance on the basis of conventional (EPS, NOPAT, ROCE, RONW, NI, CFO and RI) corporate performance measures and value based measure i.e. EVA in explaining contemporaneous MVA.
3. The present study explores the suitability of using EVA as a measure of corporate success as well as providing additional empirical evidence on the use of EVA in Indian Companies. Specifically, the statistical association between EVA and the creation of shareholders wealth has been empirically examined and highlighted.
4. The study does not seek, though, to fully explain the determinants of MVA, but only to show how well EVA and conventional financial performance measures acts as a genuine explanatory variable for MVA, in order to justify its usefulness for performance measurement, shareholder value creation and financial reporting in Indian companies.

1.7 OBJECTIVES OF THE STUDY

The title of the present study is "**EVA and Conventional Corporate Performance Measure: An Empirical Analysis of Indian Companies**". The basic objective of the study is to examine the efficacy of EVA and conventional performances measures both at aggregate and disaggregate (industry) levels in explaining the MVA of Indian companies and provide empirical evidence. As such, it requires comparing the performance of the sample companies on the basis of various conventional performance measures along with EVA and establishing its relationship with the market value added of Indian companies. Further, it is on the basis of value relevance (relative information and incremental information content tests) of various measures, it can be concluded that whether EVA is superior corporate performance measures than conventional performance measures or not. Accordingly, a clear statement of the objectives of the study becomes necessary and important. This is particularly important for ensuring that the focus of enquiry is not lost at any stage. The following are the broad objectives of the present study:

1. To analyze the performance of the sample companies on the basis of various performance measures
2. To examine whether a statistical relationship between EVA and shareholder value (as measured by MVA) exists, and if it does, how much variations of the shareholder value (MVA) can be explained by EVA.
3. To know whether EVA dominates conventional performance measures in explaining MVA of sample companies.
4. To examine EVA components, such as Cash Flow From Operations (CFO), Interest Expenses (ATI), Accruals (ACC), Cost of Capital (CC) and Accounting Adjustments (ADJ) in order to know whether components unique to EVA helps in explaining contemporaneous MVA beyond the explanation given by other components.
5. To examine the behavior of EVA and traditional financial performance measures in explaining contemporaneous MVA among different industries.

1.8 OVERVIEW OF THE RESEARCH DESIGN

Although the detailed research design used in the present study is described in chapter 4. A brief overview of the research design is presented in this section.

1. **Sample Size**: The final sample analyzed consists of 996 non-financial companies listed on Bombay Stock Exchange (BSE) for the period 2000-2009. Final sample is constructed using following criteria: ***first,*** the firm must be listed throughout the

period of the study (i.*e. 2000 onwards*); ***secondly*** the full data regarding all variables must be available about the sample companies for complete ten years.

2. **Data Source**: Mainly secondary data source have been used for data collection. Requisite data has been collected mainly from ***Prowess -CMIE data base***, ***Capitaline database*** Annual reports of the companies, Directories of Stock Exchanges, Websites of Bombay Stock Exchange (BSE) and Reserve Bank of India (RBI) etc.

3. **Research Variables**: Market Value Added (MVA) - commonly used variable to measure corporate performance and value creation is used as dependent variable. In addition to MVA, Economic Value Added (EVA), Return On Capital Employed (ROCE), Return On Net Worth (RONW), Earnings Per Share (EPS), Net Operating Profits After Tax (NOPAT), Net Income (NI), Cash Flow From Operations (OCF) and Residual Income (RI) are used as independent or explanatory variables.

4. **Research Tools and Techniques:** This study employ **panel data regression** (or sometimes referred as pooled data regression) to test the research hypotheses. The panel data regression analysis is an advanced analytical technique that captures not only the variations of a single firm over time and variations of many firms at a given point in time, but the variations of these two dimensions simultaneously (Baltagi, 2005; Pindyck and Rubinfeld, 1998). In the last decade or so, panel data analysis has become central in quantitative studies. Its popularity has been greatly increased among social and behavioral science researchers and it became one of the most active and innovative bodies of literature in econometrics. The main limitation of basic regression is that it is based on the assumption that parameters do not vary across sample observations. Whereas, pooled time series model (panel) allows parameters to vary in some systematic and/or random way across partitions of the sample data or even from observation to observation. In the present study, to test the relative and incremental information content of various performance measures, various univariate and multivariate econometric models are used and analyzed. The statistical models used in the study are based on the combination of earlier work of various researchers such as Biddle *et al.*, 1997; Chen and Dodd, 1997& 2001; Elali, 2006; Erasmus, 2008; Ismail, 2006; and Kramer and Pushner, 1997.Econometric and statistical packages like EViews version 6 and Statistical Package for the Social Sciences (SPSS) version 18 are used for data analysis and model testing.

1.9 ORGANIZATION OF THE THESIS

The chapter plan of present study is designed to cover the concerns which are important to the research study and critical to the identified objectives. The whole study is comprehensively covered under six chapters. The chapter plan is as follows:

Chapter 1 provides an introductory view of the various aspects of the study – changing objective of the firm and role of performance measures, traditional corporate financial performance measures and their shortcomings; rational behind value based measures; and relationship between corporate performance measures and shareholder value creation. Further, the chapter includes the rationale and justification of research, scope of the present study and research objectives. Finally, the chapter concludes with chapter plan of the study.

A brief review of literature related to EVA and traditional corporate performance financial measures has been included in **Chapter 2.**

Chapter 3 has been assigned to the detailed discussion about various measures of corporate financial performance. This chapter is divided in two parts: Part A discusses about the traditional or conventional performance measures; their types, computation methodology of each measures and advantages and shortcomings of each performance measures are explained. Part B of the chapter discusses about value based measures with special focus on EVA and MVA; historical development of EVA, computation methodology of EVA; various adjustments required to calculate EVA and advantages of EVA over conventional performance measures have also been presented in this part.

Chapter 4 contains the research framework used in the thesis. It defines the research questions empirically examined, research hypotheses, research variables used in the present study. The chapter further outlines the research methodology, statistical tool and research models applied to test the research hypotheses and achieve research objectives.

Chapter 5 to Chapter 7 constitutes the core of the study. **Chapter 5** presents the analysis and interpretation of the various performance measures used in the study based on sample data. This chapter is based on analysis of the efficacy on the performance measures at aggregate basis. The results of a comprehensive statistical investigation are presented for each hypothesis and discussed in detail in this chapter. In **Chapter 6,** using the industry wise data, the behavior of various performance measures has been examined to find out which out of the traditional or value based measures is better predicator of firm value in the different industries. The analysis is based on regression methodology of the sample data, and to rank the performance measures to find out the best predictor of shareholder value in Indian industries. Summary, conclusions and suggestions are presented in **Chapter 7**. **Bibliography** and **Annexure** are exhibited at the end.

1.10 CONCLUSION

The onset of globalization and liberalization of the Indian economy over that last two decades has resulted in shift of the corporate goals from socio- economic focus to an increasing shareholders value. So, the present day required the metrics, which helps to judge or measure organizational progress and achieve the organizational strategic goals. Although there are few traditional performance metrics like balance sheet measures which express the rate of return, shareholders profit and earnings per share and another performance metrics is market driven measures which express the market capitalization, price earnings ratio etc. But there are certain deficiencies because balance sheet based measures shows only notional profits but not real profit and market driven measures are prone to volatility of the bourses. The requirement is for mix and match measure that can factor in a market's assessment of a company's value.

Thus, Economic Value Added (EVA) is a measure of corporate performance that differs from most others by including a charge against profit for the cost of all the capital of a company employs. Economic Value Added (EVA) is much more than just a measure of performance. It is a framework for a complete financial management and incentives compensation system that can guide every decision. A company makes from the broad room to the shop floor that can transform a corporate culture, which improve the working lives of everyone in an organization by making them for active and that can helps to produce more wealth to shareholders and customers.

It can be concluded that this research focuses to examine the efficacy of traditional or value based corporate performance measures in explaining the Market Value Added (MVA) at both aggregate and disaggregate (industry) level in Indian companies. Many studies have been undertaken to investigate the efficacy of value based and traditional corporate performance measures. But very little empirical evidence is available about developing market like India. The results of such studies are quite mixed. Further the studies about industry wise analysis of the efficacy of performance measure especially about Indian industries are almost non-existent. It is expected that the findings of this study will significantly contribute to the investigation by providing evidence at both aggregate level and industry level in the context of India.

Notes

1. The goals of maximizing stock prices in long run , in turn maximizing share holder's wealth, is an objective for firms that are publicly traded. However, firms that are private have another crucial goal i.e. the maximization of the firm's value. Since firm value is not directly observable and has to be calculated, these kinds of firms can not enjoy a major benefit that publicly held ones can – they are deficient in the feedback that other ones may get due to a policy change, a new project take over or also while making chief decisions. Stock price maximization is the most limiting of the three functions. It requires that managers work efficiently and take appropriate decisions that may cause the maximization of their shareholders' wealth. Also, the bondholders should be protected from expropriation, the market should function efficiently and there should be negligible social costs. Shareholders wealth maximization is slightly less restrictive. It does not require that market be efficient. Firm value maximization is the least limiting. It does not require that bondholders be guarded against expropriation. Therefore, when a firm's action (such as investing or financing) maximizes its value, it will also maximize its stock value and the shareholders wealth only under the assumption of these limiting factors. Equally, an action that increases the stock price where the less restrictive assumptions do not hold, the increase in firm value is not necessary. Maximizing shareholder's value is becoming primary objectives of the firms in today's competitive and challenging business environment.
2. The Efficient Markets Hypothesis (EMH), popularly known as the Random Walk Theory, is the proposition that current stock prices fully reflect available information about the value of the firm, and there is no way to earn excess profits, (more than the market overall), by using this information. It deals with one of the most fundamental and exciting issues in finance – why prices change in security markets and how those changes take place. The semi-strong-form of market efficiency hypothesis suggests that the current price fully incorporates all publicly available information. Public information includes not only past prices, but also data reported in a company's financial statements (annual reports, income statements, filings for the regulatory authorities such as SEC, SEBI, etc.), earnings and dividend announcements, announced merger plans, the financial situation of company's competitors, expectations regarding macroeconomic factors (such as inflation, unemployment), etc. In fact, the public information does not even have to be of a strictly financial nature.
3. See Riahi-Belkaoui, 1993; Chen and Dodd, 1997; Lehn and Makhija, 1997; and Rogerson, 1997
4. On this see (Ferguson and Leistikow, 1998; Knight, 1998).
5. Rappaport (1986 and 1998).
6. A related measurement issue is that these ratios use financial data that is an accumulation of monetary valuation from different time periods. For example, the gross plant account includes the cost of assets purchased at different points in time. If there is significant inflation in some of the historical periods, this results in an "apples and oranges" addition problem for most accounts that affect total assets and equity, distorting the calculated return on investment
7. Economic Value Added or EVA is a relatively new measure of corporate performance developed and trademarked in the late 1980s by the US-based business consultants Stern Stewart and Co. (hereafter referred to as Stern- Stewart).
8. For this see Stewart (1991, p. 66).
9. See Fortune September 20, 1993 (pp. 38-50) and November 9, 1998 (pp. 93-204).
10. Herzberg (1998, p.45) stated that instead of using dividend discount approach, the EVA model measure value form the point of the firm' capacity for ongoing wealth creation rather than simply wealth distribution.
11. On this see Myers (1996); Chen and Dodd (1997); Biddle *et al.*,(1997); Ittner and Larcker (1998 and 2001); Arnold and Davies (2000); Fabozzi and Grant (2000); Garvey and Milbourn (2000); Rajan (2000); Black *et al.* (2001); Worthington and West (2004); Feltham *et al.*, (2004); Ferguson *et al.*, (2005); and Erasmus and Lambrechts (2006);
12. On this see Bhattacharya, A. K. "Schedule VI of Companies Act under revision", Business Standard, New Delhi, issue, June 29 (2009)

CHAPTER 2
REVIEW OF LITERATURE

CHAPTER 2
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Preview

This chapter presents review of literature of Economic Value Added (EVA) and conventional performances measures both at aggregate and disaggregates (industry) levels in explaining the MVA of Indian companies. Maximizing shareholders value is fast becoming a corporate standard all over the world. However, the choice of performance measures is one of the most critical challenges facing organizations. With increased competition and greater awareness among investors, new and innovative ways of measuring corporate performance are being developed. The perceived inadequacies in traditional accounting performance measures have motivated a variety of measurement innovations such as economic value. Measuring shareholders' value has been the subject of intellectual interest among the academicians, corporate managers and practitioners in recent times. The thrust of research in this regard during the last and half decade has been mainly in the direction of issues such as, EVA and stock returns, incremental information content test, relative information content, EVA-MVA relationship, executive compensation, comparison with conventional performance measures, EVA and accounting adjustments and implementation aspects of EVA. In the last section based on the literature review, a conceptual model is prescribed.

2.1 INTRODUCTION

As the pressure for performance has increased manifold due to an ever increasing integration of the corporate world, financial analysts have been forced to search for newer ways of defining and understanding corporate financial performance. Efforts have also been made to hunt up older concepts and to revisit them in the light of a rapidly changing competitive business environment. This quest has led the researchers and analysts alive, to the age old concept of *value added*[1] and attempts are being made to bring it into a wider circle of acceptance by corporate managers. The "value added" is a theoretically established concept. However, the practical application of the same, in terms of it becoming a formal and statutory item of performance disclosure, has still some catching up to do.

Of late, researchers and thinkers in the financial arena have begun to write profusely about the issue by combining the conventional performance measures with value based measures and to find out which among the financial performance measures- conventional accounting based or value based measures is better link with the market value of the corporations. Various but very less empirical attempts have been made to validate this concept as a measure of financial performance. There is a growing interest of the researchers in the Universities and other research bodies in undertaking studies on various aspects of performance measures especially on comparing the efficacy of value based and traditional measures.

Various studies have been undertaken first in developed market and later in developing markets to analyze the efficacy of various financial performance measures. An attempt has been made in this chapter to identify the ***main issues*** which constitute the thrust of research in this area during the around two decade or so, and present a brief review of the relevant literature in this regard. The issues have been identified as follows:

- ***Relationship of Economic Value Added (EVA) and other performance measures with Market Value Added (MVA).*** In this category main studies includes Stewart (1991); Grant (1996); Lehn and Makhija (1996); Milunovich and Tsuei (1996); O' Byrne (1996); Uyemura *et al.,* (1996); Kramer and Peters (2001); De Wet and Hall (2004); Kim (2006); Ramana (2007); and Lee and Kim (2009).
- ***Evidences on relationship between stock returns, accounting earnings and Economic Value Added.*** There are two broad categories of results implied by the studies under this category***: first*** empirically showing the superiority of EVA in explaining stock returns and ***second*** category showing superiority of other performance measures such as Net Income(NI), Cash Flows, EPS etc. in explaining the stock returns Among studies belonging to this category one may include, for instance Riahi-Belkaoui (1993); Riahi-Belkaoui and Picur (1994); Dodd and Chen (1996); Peterson and Peterson (1996); Bacidore *et al.,* (1997); Biddle *et al.*, (1997); Chen and Dodd (1997); De Villiers (1997); Lehn & Makhija (1997); Bao & Bao (1998); Clinton and Chen (1998); De Villiers and Auret (1998); Stark and Thomas (1998); Goetzmann and Garstka (1999); Stewart (1999); Gunther *et al.,* (2000); Turvey *et al.*,(2000); Chen and Dodd (2001); Eljelly and Alghurair (2001); Worthington and West (2001); Copeland (2002); Keef and Rush (2003); Sparling and Turvey (2003); Forker and Powell (2004); Worthington and West (2004); Elali (2006); Ismail (2006); Kim (2006), Lin & Zhilin (2008); Lee and Kim (2009); ArabSalehi and Mahmoodi (2011); Kumar & Sharma(2011); and Moeinadin *et al.,*(2011)
- ***Role of performance measures in compensation management and Firm Value***. Studies falling in this area include, for instance, Stern (1990); Burkette and Hedley (1997); Young (1997); Robertson and Batsakis (1999); Riceman *et al.*, (2000); Liao, *et al.,* (2005); and Irala (2005).

- ***Miscellaneous issues***, such as, accounting adjustments and Economic Value Added, shareholders valuation, superiority of EVA as compared to traditional performance measures, role of performance indicators, drivers of shareholders value, EVA adoption and firm performance, importance of value based management, criticism against traditional performance measures, uses advantages, limitations and calculations of EVA and literature review on EVA. Among the studies more or less covering these issues may be listed Ochsner (1995); Booth (1997);Tully (1997); Weissenrieder (1997); Young (1997); Saksena (1998); Pattanayak and Mukherjee (1998); Anand *et al.,* (1999); Saha (2000); Acheampong and Wetzstein (2001); Worthington and West (2001); Lovata and Costigan (2002); Bardia (2002); Irala (2005); Anderson *et al.*, (2005); Lloyd (2005); Liao *et al.,* (2005); Pandey (2005); Mohanty (2006); Ghanbari and Sarlak (2006); Petravicius and Tamosiuniene (2008); Lin and Zhilin (2008); Mittal *et al*., (2008).

2.2 RELATIONSHIP OF EVA AND OTHER PERFORMANCE MEASURES WITH MVA

Stewart (1991) found strong correlation between EVA and MVA. Using a sample of 613 US companies over the period 1987-1988 and examining both levels and changes in EVA and MVA, he provided evidence of a striking relationship between both levels of EVA and MVA, and even more pronounced, between changes in these levels. Since the correlation between changes in EVA and MVA was high, he suggested that adopting the goal of maximizing EVA and EVA growth would in fact build a premium into the market value of the company.

Stewart (1994) investigated the performance of the largest 1,000 American companies and reported that the change in EVA explains 50% of the change in MVA (the remaining 50% is explained by the future EVA), whereas the change in sales explains only 10% of the change in MVA, comparing it with 15–20% of the change in earnings per share (EPS) and 35% of the change in ROE.

Lehn and Makhija (1996) using a sample consisting of 241 US companies over the years 1987, 1988, 1992, and 1993, examined EVA and MVA as measures of performance and as signals for strategic change. They found that (a) both EVA and MVA correlated positively with stock returns and that this correlation was slightly better than the traditional performance measures and (b) both EVA and MVA were effective performance measures containing information about the quality of strategic decisions and that they can serve as signals for strategic changes.

Uyemura *et al.,* **(1996)** studied the relationship between MVA, EVA and four traditional performance measures: EPS, NI, ROE and ROA. They provided evidence suggesting that the correlation between MVA and those measures are: EVA 40 per cent, ROA 13 per cent, ROE 10 per cent, NI 8 per cent and EPS 6 per cent thereby establishing the superiority of EVA over traditional measures in explaining MVA.

O'Byrne (1996) studied the association between market value and two performance measures: EVA and NOPAT. He showed that both measures had similar explanatory power when no control variables were included in the regression models, but that a modified EVA model had greater explanatory power when indicator variables for 57 industries and the logarithm of capital for each firm were included as additional explanatory variables. However, since author did not make similar adjustments to the NOPAT model, it was impossible to compare results using the different measures.

Milunovich and Tsuei (1996) investigated the correlation between frequently used financial measures (including EVA) and the MVA of companies in the US computer technology industry The results of the study reveals that correlation of different measures were EVA; 42%, EPS growth ; 34%, ROE; 29%, Free cash growth; 25% and FCF; 18% for the period from 1990 to 1995. The results clearly states that EVA demonstrated the best correlation and it would be fair to infer that a company that can consistently improve its EVA should be able to boost its MVA and therefore its shareholder value.

Grant (1996) studied the relationship between EVA and corporate valuation. The sample consisted of 983 U.S. companies from Stern Stewart's performance database for 1993. He found that the EVA-to-capital ratio (EVA/CAPITAL) explains approximately 32% of the variable MVA-to-capital ratio (MVA/CAPITAL). Grant used the MVA- and EVA-to-capital ratios to adjust for firm size and suggests that EVA has a significant impact on the market-value-added of a firm and this wealth effect stems from the company's positive residual return on capital.

Luber (1996) identified that MVA is in conformity with the direction of the market. It has been observed from the study that a company which shows a positive EVA over a period of time will also have an increasing MVA, while negative EVA will bring down MVA as the market looses confidence in the competence of a company to ensure an attractive return on the invested capital. The five topmost companies as the wealth creators - Coke, GE, Microsoft, Merck and Philip Morris - have strong EVA and are expected to remain in the top position in the imminent period.

Banerjee (1997) in his paper conducted empirical research to find the superiority of EVA over other traditional financial performance measures. Ten industries have been chosen and each industry is represented by four/five companies. ROI and EVA have been calculated for sample companies and a comparison of both has been undertaken, showing the superiority of EVA over ROI. Indian companies are gradually recognizing the importance of EVA. Some of such companies are Ranbaxy Laboratories, Samtel India Ltd., Infosys Technologies Ltd. and Satyam Computer Services Ltd.

Kramer and Pushner (1997) studied the strength of the relationship between EVA and MVA, using the Stern Stewart 1000 companies for the period between 1982 and 1992.They found that although MVA and NOPAT were positive on average, the average EVA over the period was negative. No clear evidence is found to support the contention that EVA is the best internal measure of corporate success in adding value to shareholder investments. In fact, from their studies it seems as if the market is more focused on profits than on EVA. They also suggest that compensation schemes must rather be tied to profits than to EVA.

De Villiers (1997) studied the inability of EVA to explain at least as much variation in stock returns as traditional accounting earnings and proposed a variant called $AEVA^2$. It suggests that AEVA be used instead of EVA for financial decision-making under inflation. AEVA also provides an alternative to inflation accounting, and could be used under inflation to estimate actual profitability from conventional historical cost accounts.

Ehrbar (1998) reports that several empirical analyses have been carried out by Stern Stewart using the Performance 1000 database. According to the Stewart findings, EVA explains half of the volatility in companies' MVA, the highest correlation found.

Banerjee (1999) agreed upon that among the selected independent variables (EPS, EVA, Kp, Lp and ARONW), EVA proved to be the most explanatory variable, when MVA was taken as the dependent variable by using a time frame of eight years in Indian companies. Thus, the study established the superiority of EVA as compared to other competing measures.

Thenmozhie (1999) in her study explained the concept of EVA and compared it with some other traditional measures of corporate performance viz.; ROI, EPS, RONW, ROE, ROCE etc. She has used the coefficient of determination to demonstrate that the traditional measures do not reflect the real value of the shareholders, and thus EVA has to be taken into account to measure the value of shareholders' wealth and also described the concept of EVA in the Indian scenario with specific reference to companies like NIIT, Hindustan Lever and ITC. Thenmozhie has referred to some of the shortcomings of the concept of EVA but maintains that EVA is a better measure of corporate performance as compared to the traditional measures.

Mangala and Simpy (2002) clarified that maximizing shareholders' value has become the new corporate perception. Although shareholder's wealth maximization the ultimate corporate goal had already been recognized by managers and researchers, it has gained a new dimension only in the recent years, due to the introduction of the concept Economic Value Added (EVA). EVA was invented and registered by Stern Stewart and Co., New York, believing that EVA is the most important driver influencing the market value of a share. So, if the company improves EVA by increasing Return on Capital Employed and lowering Cost of Capital, its market value will increase. The study also examined the relationship between EVA and Market Value among various companies in India. The results of the analysis confirmed Stern's hypothesis concluding that company's current operational value (COV) is more significant in contributing to a change in market value of shares in Indian Context.

Kumar (1999) observes that shareholders wealth is measured by the return they receive on their investment. Returns are in the form of dividends and in the form of capital appreciation reflected in the market value of the shares, of which market value are the dominant parts. Various measures like EPS, ROE, ROCE, have been used to evaluate the performance of the business findings conclude that EVA is the best method to measure the shareholders wealth.

Hall and Brummer (1999) examine which internal performance measures of a company correlate the best with its external performance measure as represented by the MVA of the corporation. The results of the empirical analyses were reported and compared with the theoretical principles. The highest consistent positive correlation coefficient obtained was between MVA and EVA with inflation adjustments to the data. The very same pattern was obtained with discounted EVA. Slightly lower positive correlations were found between MVA and ROA, ROE, EPS and DPS. The research concluded that in order to achieve efficient increases in shareholders wealth, it is necessary to concentrate on increasing the company's EVA.

Banerjee (2000) attempted to find out whether Stewart's claim that market value of a company is equal to the discounted value of all future EVAs, holds good in the Indian context or not by considering a sample of 200 companies over a time span of four years (1994-95 to

1997-98). According to him, market value of a firm is the function of two components viz; Current Operational Value (COV)[3] and Future Growth Value (FGV)[4]. COV is equal to the book value of beginning invested capital plus the capitalized value of current year's EVA, whereas FGV represents the present value of all future expected future improvements. Based on the analysis of data researcher comes to the conclusion that in many cases there is a considerable divergence between MVA and the sum total of COV and FGV. However, researcher points out that this divergence may be due to the short time span of the study, thus leading to the inability of FGV to capture the growth potential factored in the market value of company's' shares.

Swain *et al.,* **(2002)** explained that how market value added (a measure of external performance and considered to be the best indicator of shareholders' value creation) was correlated with the firm's performance in terms of financial measures of the company such as Economic Value Added, Net Operating Profit After Tax, Return On Capital Employed, Return On Net Worth and Earnings Per Share on the one hand and the purely economic factor of the company such as labor productivity, capital productivity , total factor productivity, sales and R&D expenditure on the other hand. Analysis of a sample of 28 Indian pharmaceutical companies 1992- 93 to 2000-01, the findings of the study conclude that EVA and NOPAT outperform other financial and economic measures in predicting MVA in most of the Indian pharmaceutical company.

Verma (2002) analyses direct correlation between the investment in stakeholder relationships and corporate performance of Indian banks. Many Indian banks seems to have destroyed shareholder's wealth over a period of time and only a few have positively contributed to their wealth. With the help of EVA (Economic Value Added) and MVA (Market Value Added), the study examines an appropriate way of evaluating bank's performance and also finds out which Indian banks have been able to create (or destroy) shareholders wealth since 1996- 1997 to 2000-2001. The overriding message of this study was that banks must always strive to maximize shareholders value without which their stocks can never be fancied by the market.

Abdeen and Haight (2002) analyze the uses, benefits and limitations of economic Value Added (EVA) as a value creation measure. They compare the performance of EVA user companies with non-user Fortune 500 companies for the years 1997 and 1998. It shows that average profits as percentage of revenues, assets, and stockholders' equity of EVA users were higher than that of non-users. They concluded that EVA will become less popular in its use as an instrument of control and performance evaluation. Therefore, the conclusion of this research is not in support of EVA use as a measure of value creation to stockholders.

Taub (2003) observes that most tools in industries only concentrate on financial information or accounting information, however EVA is a combination of market, accounting and economic information giving it a much wider net. He also found that change in EVA explains 35 percent of the change in Market Value Added (MVA), or seven times more than sales growth, consequently the change in EPS explains only about 3 percent of the change in MVA.

Fernandez (2003) analyzed 582 companies in respect of correlation between increase in the MVA and EVA, NOPAT, and WACC for successive ten years. The results revealed that the average correlation between the increase in the MVA and EVA, NOPAT and WACC was 16%, 21% and -21%. The author has also analyzed the relationship between shareholders' value creation and various other parameters, including economic profit and EVA, from 1991 to 1997. The increase in the firm's value was basically determined with the changes in the growth in the firm's cash flow, and by the changes in the firm's risk, which lead to changes in the discount rate.

Tian *et al.*, **(2003)** investigates related issues by examining the information contents of EVA and other competing measures for firms listed in Hong Kong. It was found that although the average EBEI and CFO in Hong Kong were positive, the average EVA in Hong Kong was negative. Some industries (for example, the utilities industry) had high EBEI and CFO, but low (or more negative) EVA. Another interesting finding is that the correlation of the market value and EVA of companies were negative. It was expected that the (estimated) EVA should be positively correlated with the market value of the firm. It may be argued that the negative EVA and the negative estimated EVA coefficient in Hong Kong might due to the family enterprises, formation of extensive corporate pyramids, and the abilities to expropriate outsiders. Hong Kong provided some interesting insight to the use of EVA as a performance measures in markets with difference governance mechanism.

Ramana (2004) empirically examines the relationship between MVA and EVA of the Indian companies. Although the focus of the study was the relationship between EVA and MVA, it also tries to understand the relationship between MVA and other common accounting numbers like NOPAT, PAT, PBIT, and CFO. Results of the study indicate that there is no strong evidence to support Stern Stewart's claim that EVA is superior to the traditional performance measures in its association with MVA.

Malik (2004) analyses a sample of 50 manufacturing publicly traded Indian companies covering a period of five years, i.e. from 1998 to 2002 conclude that the selected independent variable and EVA – the depended variable, are correlated and can't be treated as water –tight compartment. There exist positive and high correlation between EVA and other financial variables -RONW, ROCE and a positive but low correlation between EVA and EPS. Comparing EVA with traditional performance measures it has been found that not even a single traditional performance metric explain to the fullest extent variation in shareholder wealth. Another finding of this study is that ROCE must be greater than cost of capital employed (COCE) to have a positive EVA and it is this spread i.e., a difference between the percent ROCE and COCE that has a direct impact on shareholder wealth. Larger the spread, greater will be the value addition to the shareholder wealth and vice-versa.

Singh and Garg (2004) analysis a sample of 200 companies, which constitute BSE-200 or BSE- Dollex covering a period of five years, i.e. from 1998 to 2002. They conclude that, the companies who are performing well would be benefited a lot by winning the market sentiments and would learn to value the stakeholder by making some additional in their financial interest in the corporate world.

Zaima *et al.*, **(2005)** examines the effects of the economy and EVA on MVA. The results indicate that EVA and GDP significantly affect MVA. Furthermore, the MVA-EVA relationship shows a systematic bias between the largest MVA firms and the smallest MVA firms. Overall, study provides implications for corporate executives utilizing EVA to evaluate managerial performance linked to MVA.

De Wet (2005) analyzed the database of 89 South African companies and observed that the Standardized Cash Flow from Operations (CFO divided by the Invested Capital in the beginning) had an r^2 of 38% with the Standardized MVA (MVA divided by the Invested Capital in the beginning), which was found to be the best driver as compared to the Standardized EVA (EVA divided by the Invested Capital in the beginning), ROA, ROE, EPS and DPS. He also observed that correlation of EPS and DPS with MVA was insignificant and thus questioned the logic of using EPS and DPS for valuing the shares.

Kim (2006) provides empirical evidence on the relative and incremental information content of EVA and traditional performance measures, earnings, and cash flow. Regression analysis tests the information content of EVA and indicates that earnings are more useful than cash flow in explaining the market value of hospitality firms. EVA itself has very little explanatory power. Incremental information content tests show that EVA makes only a marginal contribution to information content beyond earnings and cash flow. Overall, the results do not support the hypothesis that EVA is superior to traditional accounting measures in association with equity market value.

DeWet and Hall (2004) highlight the importance of Economic Profits (EVA) and their long terms effects on shareholder value (MVA). South African companies listed on JSE were analyzed and results reveals that the relative measure of internal performance (spreads-difference between ROIC and WACC) can be used to rank the companies in terms of value creation. Individual companies and sectors were also placed on a financial strategy metrics, which evaluated companies according to spreads and cash management. Statistical test (regression) results showed that there is positive relationship between spreads and shareholders' value, but sales growth less sustainable growth rate does not contribute significantly to shareholders value.

Tsuji (2006) evaluate the effectiveness of Economic Value Added (EVA), a metric that is increasingly used in Japan as a measure of corporate value. EVA is compared with several other valuation measures including cash flow, Operating Income, and Profit After Tax from the viewpoint of both levels and changes using panel data regression models. Also two different forms of EVA are examined by using the Weighted Cost of Capital (WACC) from the Capital Asset Pricing Model (CAPM) and the WACC from the Fama-French (1993) model. The results reveal that corporate market values in both levels and changes have stronger linkages with cash flow and other earnings measures than either form of EVA. The empirical results also suggest that EVA and the several other valuation measures analyzed in this study should be used cautiously not only in the Japanese market, but also in international capital markets as well.

Elali (2006) investigated the assertions that EVA is more highly associated with shareholder wealth and firm values than are traditional performance measures. Two commonly used value-based performance metrics – namely, Total Shareholder Return (TSR) and Tobin's Q were also considered to highlight the value-relevance of EVA vis-a-vis these measures in predicting shareholder wealth. Using a panel sample of about 1000 American firms over the period 1990–2002, the study found compelling evidence consistent with the notion that EVA outperforms other traditional performance measures in explaining shareholder wealth. Value-relevance tests reveal EVA to be more highly associated with shareholder wealth than TSR and Tobin's Q. The incremental value-relevance tests have also suggested that EVA possesses the largest explanatory power over TSR and Tobin's Q. These results conclusively support the claims made by EVA proponents and further support the potential usefulness of EVA metric for internal and external performance measurement.

Nagar (2007) examined the various drivers of shareholders' value. The study has been conducted to find out the correlation of the measures like ROCE, RONW, EPS, DPS, Cash Flow from Operations, and Economic Value Added with Market Value Added (MVA). The regression analysis suggests that RONW is the most important variable which explains 34.79% of the variance in MVA, which is not a surprise since shareholders should value an enterprise, based on the return what they are getting on their invested money, which proves that it doesn't matter whether the company retains or distributed its earnings, so long it is being utilized for productive purposes. EVA values do have an impact on the MVA of the companies. It takes into account the opportunity cost of capital and it is proved that increase in EVA does add value for the shareholders. ROCE also has some impact however EPS, DPS and Std. Cash Flow from Operations have shown insignificant relationship. Thus Return on Net worth (RONW) and Economic Value Added (EVA) emerges as strong drivers of the shareholders' value.

Nappi-Choulet *et al.,* **(2007)** investigates the association between EVA and MVA generated by French listed companies and the weight of real estate in their assets' portfolio. Using a pool sample composed of the 250 companies over the period 1999-2004, empirical results show that, an increase in the proportion of real estate assets (over total assets) is negatively associated with EVA, but specifically for firms in the service industries exhibiting low real estate intensity. The regressions on MVA show a negative association with the change in the real estate for firms outside the service industries. Those results suggest the sales of real estate assets can be driven by value maximizing behavior.

Misra and Kanwal (2007) argue that accounting based metrics are misleading measures of corporate financial performance as they are vulnerable to "accounting distortions". Major corporate failures like Enron, World Com etc. have brought to fore the malleability of these accounting based measures. Also, with the increasing participation of institutional investors in maturing stock markets the investment decisions are increasingly being based on intrinsic value. The objective of this study is to find out whether EVA finds a better reflection in the firms' stock prices. Results of the study reveal that EVA (%) is the most significant determinant of MVA as it explains the variations in share value better than the other selected measures of firms' financial performance. EVA (%) is followed by ROTA, which is slightly less significant than EVA (%) in explaining the variations in the market value of firms' shares. EVA (in absolute terms) and ROCE have been found to be the third and the fourth most significant variables respectively in explaining the variation in the share prices. They concluded that EVA (%) has emerged as the most significant variable, better than the traditional metrics of financial performance in determining the share prices.

Chmelikova (2008) investigated the relationship between Economic Value Added, traditional performance measures (Return On Assets 'ROA' and Return On Equity 'ROE') and their ability to measure the creation of shareholder wealth in food-processing firms in the Czech Republic. The regression analysis results indicate in all cases a positive correspondence between EVA and financial performance metrics and show higher quality information content of EVA indicator as regards the ability to create shareholder wealth than the traditional performance measures. The study supports the assertion that EVA is superior to traditional measures in explaining changes in MVA. This result is consistent with that of proponents of EVA such as Stewart (1991), O'Byrne (1996), Elali(2006) etc. and contrary to the results of Biddle *et al.*, (1997) or Turvey *et al.*, (2000) etc.

Kumar and Sharma (2011) examine the claim of Economic Value Added (EVA) proponents about its superiority as a financial performance measure compared to five traditional performance measures in Indian manufacturing sector for the study period 2000-2009. Results of relative information content test reveals that NOAPT and OCF outperform EVA in explaining the market value of Indian companies during 2000-2009. Incremental information content test conclude that EVA makes a marginal contribution to information content beyond NOPAT, OCF, ROCE and RONW. Overall, empirical results about Indian companies refute the hypothesis that EVA is superior than traditional accounting based measures in association with market value of the firm during study period.

2.3 SUPERIORITY OF EVA IN EXPLAINING STOCK RETURNS

Riahi-Belkaoui (1993) examined the relative and incremental content of value-added, Earnings and Cash Flows in the US context. The results indicated that the information content of value-added is a major determinant of market returns, providing incremental information content beyond both Net Income and Cash Flows.

Riahi-Belkaoui and Picur (1994) analyses whether value added variables possess incremental information beyond accrual earnings in the context of explaining security return. The evidence points to the superior explanatory power of value added variables in explaining security returns of US firms that disclose data needed for the computation of net value added.

Lehn and Makhija (1997) studied the relation between six performance measures and stock returns. They used data from 452 U.S. companies from 1985 to 1994. The results revealed that EVA and MVA are effective measures of performance. Moreover, the correlation of EVA with stock returns (.59) was slightly higher than the correlation of MVA (.58), ROE (.46), ROA (.46), or ROS (.39). Thus, EVA and MVA appear to be somewhat better long-run performance measures than conventional accounting performance measures.

Pearson (1998) compared the explanatory power of EVA to that of Refined Economic Value Added (REVA) for share returns on the mining sector of the Johannesburg Stock Exchange (JSE). He found that, while EVA partially explains share returns, REVA does not appear to explain these returns at all. Manipulating the EVA information to obtain the annual change in EVA leads to the finding that the annual change explains a significant portion of share returns in the mining sector. This suggests that positive changes in EVA from one year to the next could be a reliable measure of management performance.

Kleiman (1999) in his paper presented new evidences on companies who have adopted EVA as performance measures. The study compares total returns to shareholders with those of companies in the same industries for two; three and four-year time horizons from the time companies began to adopt EVA. When compounded, these results amount to 28.8% percentage points of extra total return over four years versus the median industry competitor. Overall, EVA companies created $124 billion more in stock market value than their median competitors. This study has also shown that companies that adopt EVA as the basis for a total management and incentive compensation system benefit from an improvement in operating performance as measured by traditional financial ratios. In particular, operating profit margin before depreciation and operating income before depreciation per employee demonstrate material improvements vis-à-vis S&P 500 companies as a whole and thus concludes that increases in EVA have been accompanied by superior stock market performance.

Goetzmann and Garstka (1999) found that long-term survival of companies may be related to accounting earnings, and more, simple EPS does as well or better than EVA at explaining differences across companies and at predicting future performance.

Farsio *et al.*, **(2000)** examines the issue of EVA and its effect on stock returns. The methodology for studying the relationship between EVA and stock return consists of testing companies that are found in well known stock indices such as Standard & Poor's 500 (S&P 500) and the Dow Jones Industrial Average (DJIA). Regression analysis was employed for testing the relationships between the variables. The results of study indicate that EVA is not a good indicator of stock performance and represents just one of many available measures. In fact, it may be one of the poorest measures available, explaining only a fraction of the variability in stock return fluctuation. Findings are consistent with other studies that have found other measures to be superior to EVA in explaining the variability in stock returns.

Garvey and Milbourn (2000) examine the issue of relationship of performance measures with stock returns in a different way. They use a relatively standard principal-agent model, but recognize that while the variability of each measure is observable; their exact information (signal) content is not. The model provides a formal method for ascertaining the relative value of such measures based on two distinct uses of the stock price. First, as is well-known, prices provide a noisy measure of managerial value-added. The novel insight is that stock prices can also reveal the signal content of alternative accounting-based performance measures and show how to combine stock prices, earnings, and EVA to produce an optimally weighted compensation scheme. The results find that the simple correlation between EVA or earnings and stock returns is a reasonably reliable guide to their value as an incentive contracting tool. This is not because stock returns are themselves an ideal performance measure; rather it is because correlation places appropriate weights on both the signal and noise components of alternative measures. Author then calibrate the theoretical improvement in incentive contracts from optimally using EVA in addition to accounting earnings at the firm and industry level. That is, they empirically estimate the value-added of EVA by firm and industry. These estimates are positive and significant in predicting which firms have actually adopted EVA as an internal performance measure.

Turvey *et al.*, **(2000)** examines the relationship between economic value added (EVA) and the stock market performance of 17 publicly traded companies in the Canadian food processing sector. The research is motivated by the increased popularity of EVA in corporate finance and by the claims that high EVA causes incremental gains in share price values. Using 1996 annual reports to compute EVA and daily stock prices for 1994 through 1998, study attempt to correlate EVA with a variety of measures including accounting Return On Assets (ROA), Return On Equity (ROE), share price, the Capital Asset Pricing Model (CAPM) returns and risk, and others. Results find little support for the conjecture that high-EVA firms lead to higher shareholder value, however, because the management logic that has popularized EVA is so logical and fundamental to common practices in corporate finance that we resist dismissing EVA as a valued paradigm. Rather, we suggest that market volatility and other factors mask the short-run increments to shareholder wealth from EVA-implemented strategies.

Machuga *et al.*, **(2002)** argue that empirical research to date on the relative effectiveness of Economic Value Added (EVA) and Earnings Per Share (EPS) as measures of firm performance for stock valuation has been mixed. In contrast to prior research, which primarily focuses on the correspondence of these measures with shareholder value and changes therein, they examine their relative effectiveness in predicting future earnings and their role in enhancing the accuracy of analysts' forecasts. The results indicate that EVA contains information that is incremental to EPS in predicting future earnings. In addition, they find that despite this potential for EVA to add incremental value to analysts' forecasts of future earnings, analysts do not use the information in reported EVA appropriately, but appear rather to overweigh it.

Copeland (2002) provided evidence that earnings, EPS growth, EVA, and EVA growth are all uncorrelated with total shareholder returns (TSR). This prompted Copeland (2002) to investigate the correlation between TSR and the difference between expected and actual performance, called 'Expectation-based Management' (EBM). Since he found a significant correlation, he suggested the EBM as a better tool for performance measurement.

Peixoto (2002) for a sample of 39 Portuguese companies for the period 1995–98, it was reported that the net income variable has a higher informational content than EVA and operating profits, when the dependent variable is the market value of the companies. However, EVA appeared to have a superior informational content when the dependent variable is the MVA. The latter finding implies that EVA may perform well as a measure of evaluation of management performance, when the goal is the maximization of shareholders' wealth.

Worthington and West (2004) extended their earlier work (Worthington and West, 2001) by using three alternative formulations for pooling data analysis, namely, the common-effects, fixed-effects and random-effects models, with the fixed-effects approach found to be the most empirically appropriate and presents different results as compared to earlier work. Relative information content tests reveal returns to be more closely associated with EVA than residual income, earnings and net cash flow, respectively. An analysis of the components of EVA confirms that the GAAP-related adjustments most closely associated with EVA are significant at the margin in explaining stock returns.

De Wet and Hall (2004) analyses the relationship between EVA, MAV and leverage. The spreadsheet model was used to investigate the leverage effect of three items, namely fixed costs (DOL), interest on borrowed capital(DFL) and the cost of own capital (EVA leverage). Five different scenarios, each with a different level of DOL, DFL or EVA leverage, were assumed to determine the relationships (if any) between the different kinds of leverage as well as their impact on profits, EVA and MVA (and therefore, also the value of the firm). The results indicated that the size of the total level of leverage including EVA is determined by all three elements causing the leverage. However, there was no difference in the total leverage including EVA for scenarios where only the financial gearing differed. The analysis showed that the effect of high financial leverage is offset perfectly by the lower cost of own capital (EVA leverage). Stated differently, the total leverage including EVA is the same for all scenarios with the same fixed costs (only if WACC remains constant).

Fiordelisi (2004) investigated the information content of traditional (such as interest and intermediation margins, ROE, ROA and Net Income) and non-traditional (such as Residual Income and MVA) performance indicators in the light of creating Shareholders Value (SHV) within the banking industry. While there is a unanimous agreement on the concept of SHV, it is debated what the best method for assessing the value is created by firms for their owners, as researchers and practitioners grapple with different performance metrics. This study examines both relative- and incremental-information content focusing on the Italian banking industry. The investigation technique follows Biddle *et al.*, **(1997)** with a few departures to better tailor the analysis to the peculiarities of a bank. Our results suggest that the superiority of EVA is not verified in term of relative information content, but there is confirming evidence when considering the incremental contribution provided by its components. One feature of our findings is that they are sensitive to the proper accounting of bank's peculiar features: as these distinctive characteristics are ignored when calculating EVA, results change and there is little evidence to support the EVA's superiority.

Misra and Kanwal (2005) analyses the relationship between Economic Value Added and Share Prices of Indian companies. The objective of this research was to study the relationship that exists between the wealth of shareholders, which has traditionally been recognized as the goal of business firms, and various standard measures of firms' financial performance. Basic thrust was to establish the supremacy of EVA as a measure of financial performance over the traditional measure. The above hypothesis was tested on the time series data of BSE-100 companies for a period 1998 to 2003 using regression analysis. The results of the study conclude that EVA is better indicator of stock price as correlation was highest between EVA and stock Price.

Ferguson *et al.,* **(2006)** analyses empirically whether companies with a high adjusted-MVA or adjusted-EVA, both scaled by market capitalization, can produce excessive stock returns and superior financial performance. They examine the 1,000 companies with the largest MVA from the Stern Stewart & Co. annual Ranking Database between 1993 and 2002. By looking at the relative level of MVA and EVA, authors attempt to determine which of these measures produces more consistent predictions of stock market performance. Another objective of this study was to explore the plausibility of implementing a trading strategy based on these measures as alternative indicators of earnings momentum. A good indicator of earnings momentum would have the property that companies with superior rankings in these MVA and EVA measures would experience better stock market performance than companies with inferior rankings. The finding of the study reveals that the risk-adjusted return of the winner group ((the group with the highest adjusted-MVA) is higher than that of the loser group (the group with the lowest adjusted-MVA). However, these returns are insignificant. Hence, they suspect that the adjusted-MVA variable may be a weak alternative indicator of earnings momentum.

Maditinos *et al.*, **(2006)** used Pooled time-series, cross sectional data of listed companies in the Athens Stock exchange (ASE) over the period 1992 – 2001 to examine whether EVA or earnings are associated more strongly with stock returns. Relative information content tests reveal that stock returns are more closely associated with Earnings Per Share (EPS) than with EVA while incremental information content tests suggest that EVA adds considerable explanatory power to earnings per share.

De Wet and du Toit (2007) analyses the impact of popular financial performance measures on shareholders' wealth and concluded the superiority of EVA over ROE. They test the strength of the linear relationships between performance measures and shareholders' returns, which consist of dividends and changes in the share price. The Return On Equity (ROE) is weighed up against the present favorite, Economic Value Added (EVA) and the merits and flaws of each approach are discussed. Other approaches, such as a combination of performance measures and the expectations theory are also discussed briefly. The statistical tests performed found Spreads (a standardized EVA) to be slightly superior to ROE in explaining changes in shareholders' returns. However, the use of same year data resulted in very weak linear relationships between all the performance measures tested, relative to shareholders' returns.

Irala (2007) examines whether Economic Value Added (EVA) has got a better predictive power relative to the traditional accounting measures such as EPS, ROCE, RONW, Capital Productivity (K_p) and Labor Productivity (L_p). Analysis of 1000 companies across 6 years (6000 company years), very much supports the claim that the EVA is the better predictor of market value compared to other accounting measures. EVA is gaining recognition as fundamental measure of company performance despite the fact that it has been in existence for a relatively short period of time.

Erasmus (2008) investigates the relationship between the Cash Value Added[5] (CVA) and market adjust share returns, and compares it to Economic Value Added (EVA), Residual Income, Earnings and Operating Cash Flow(OCF). An approach similar to that of Biddle *et al*., (1997) was applied to a sample of South African industrial firm to evaluate the relative information content test of individual measures, as well as the incremental information content test of CVA components. Relative information content tests suggest that earnings have the strongest relationship with stock returns. The results from incremental information content tests that although the CVA and EVA components provide statistically significant information content beyond that provided by residual income, the level of significance is low.

Fountaine *et al*., **(2008)** examine whether economic value added (EVA) can be used to generate 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 against the cumulative returns from the other portfolio. They concluded that EVA does provide economically useful information that can be used to forecast portfolio separation. Specifically, forming portfolios based on higher and lower values of EVA divided by the average book value of debt and equity from a buy list yields portfolios with cumulative returns that are statistically different.

Sunitha (2008) examine the ability of EVA and Traditional Performance indicators in banking in capturing shareholders value. Author examines the relative and incremental information content of a set of performance measures focusing on Indian banking industry. The methodology used in this paper was similar to Biddle *et al*., (1997) with few departures to better tailor the analysis to the peculiarities of a bank. Results of the study indicate that EVA was found to provide greater relative and incremental information content than other metrics followed by Return On Net Worth and Net Income metrics. Traditional measures were also equally good in capturing the shareholders' value created.

2.4 RELATIONSHIPS BETWEEN STOCK RETURNS, EVA AND OTHER PERFORMANCE MEASURES

Dodd and Chen (1996) examined 566 American companies for the period 1986–92, discovered that EVA can explain only the 20% of the variability of stock returns, in contrast with ROA which can explain the 24.5% of the corresponding variability. They found that EVA appeared to have higher explanatory power when it was compared with ROE and EPS, but when it was compared with a simple measure of Residual Income (without the accounting adjustments of Stern Stewart) they could not identify any significant incremental informational content.

Peterson and Peterson (1996) conducted analysis for a sample of 282 American companies for the period of 1988–92 and evaluated the correlation between traditional performance measures, e.g. ROA and ROE and measures based on added value, such as EVA, MVA, changes in MVA with stock returns. They reported that EVA has a low correlation with stock returns, while the measures based only on MVA are statistically significantly correlated with stock returns.

Bacidore *et al.,* **(1997)** suggested a refinement of EVA, the REVA. REVA assesses a capital charge for a period equal to WACC times the market (rather than book) value of the company at the beginning of the period. Their sample was based on 600 companies randomly selected from the Stern Stewart Performance 1,000 database. They compared EVA to REVA and found that although both measures were statistically related to abnormal stock returns, REVA outperformed EVA.

Biddle *et al.*, **(1997)** tested the assertions that EVA is more highly associated with stock returns and firm values than accrual earnings, and evaluated which component of EVA, if any, contributed to these associations. The results indicated that earnings (R^2 =12.8%) were significantly more highly associated with market adjusted annual returns than either Residual Income (R^2 = 7.3%) or EVA (R^2 = 6.5%) and that all three of these measures dominate cash from operations (R^2 =2.8%). Correlations between the independent variables were all positive and significant except EVA and RI, which were negatively correlated with cash from operations (CFO). Earnings Before Extraordinary Items (EBEI) had the highest correlation with market-adjusted return. The empirical results do not support the conclusion that EVA dominates earnings in relative information content, and suggest rather that earnings generally outperform EVA.

Chen and Dodd (1997) extended the previous research and examined the explanatory power of EPS, ROA, ROE, RI, and four EVA related measures. Firstly, they found that improving EVA performance is associated with higher returns. However this association is not as strong as suggested by EVA proponents. No single EVA measure was able to account for more than 26 per cent of the variation in stock returns. Secondly, the EVA measures provided relatively more information than the traditional accounting measures in terms of the strength of their association to the stock returns. Moreover, they suggested that the accounting earnings provided significant incremental explanatory power above EVA. Their findings concluded that companies should not completely replace traditional accounting measures with EVA and suggested that along with EVA, companies should continue monitoring the traditional measures of accounting profits such as EPS, ROA and ROE. Finally, consistent with their previous results (Dodd and Chen 1996), they found that RI provided almost identical results to EVA, without the need of accounting adjustments advocated by Stern Stewart & Co.

Bao and Bao (1998) examined the relative informational content of Net Income, Abnormal Economic Earnings (their definition of EVA) and value added (defined as sales – cost of goods sold – depreciation) using a sample of 166 American companies for the period 1992–93. Their results did not support the argument of superior informational content of the EVA, since they found inconsistent behavior in the abnormal economic earnings variable, which produced a negative sign when the dependent variable was the value of the firm, and then changed to positive when the dependent variable was either the stock price or the stock return. The only variable, which consistently generates positive signs with high explanatory power in all three models, was the value added.

Biddle *et al.*, **(1998)** discuss the Stern Stewart claims about superiority of Economic Value Added (EVA) and provide empirical evidences on the same. Independent examination suggests that some of these claims are over stated. While evidence confirms that managers respond to EVA incentives, there is no evidence thus far to support claims that EVA is more closely associated with equity returns or firm values than is net income. To the contrary, and in contrast to claims by Stern Stewart, result suggests that earnings generally dominate EVA in value relevance to market participants. Results of the study are consistent with those reported by Chen and Dodd, 1997; and Peterson and Peterson, 1996.

Knight (1998) reported the EVA does not necessarily lead to improved financial performance, higher stock prices and higher compensation. Based on statistical evidence, Knight revealed that EVA is not as accurate as cash flow returns on investment.

Clinton and Chen (1998) analyzed the relationship of various performance measures to stock price and stock returns. In addition to EVA, they examined Cash Flow Return on Investment (CFROI) and Residual Cash Flow (RCF) as measures worth considering. They selected 325 companies from Standard & Poor's 500 and the Stern Stewart 1996 Performance 1,000 databases and studied the years from 1991 to 1995. EVA was the only measure that did not reveal a consistently significant association with either stock price or stock return.

Biddle *et al.*, **(1999)** state that numerous claims have been made about EVA and MVA, most based on 'anecdotal evidence' or 'in-house studies'. They endeavored to present 'independent research' covering a sample of more than 600 companies for the period from 1984 to 1993. Their findings showed that net income, or NI is significantly more highly associated with market-adjusted annual share returns (an r^2 of 13%) than residual income (an r^2 of 7%) and EVA (an r^2 of 6%). The r^2 of cash flows from operations was an almost insignificant 3%. Their results show no evidence that EVA is superior to earnings in its association with share returns.

Garvey and Milbourn (2000) provide evidences about EVA and stock returns. Using a cross-section of firms that have adopted EVA and announced its adoption, and a control group that did not, they found that the firms with the greatest value added from using EVA were those that had a strong correlation between EVA and shareholder returns in the first place. They do not find a strong relationship between EVA and share value, suggesting once again the self-fulfilling prophecy that those firms that show a strong relationship between EVA and shareholder value ex-ante, will also show a strong relationship between EVA and shareholder value ex-post.

Chen and Dodd (2001) empirically examine the value-relevance of three profitability measures: Operating Income (OI), Residual Income (RI), and Economic Value Added (EVA) and concluded that the market may place higher reliance on audited accounting earnings than the unaudited EVA metric did. Their findings failed to support the assertion that EVA is the best measure for valuation purposes.

Worthington and West (2001) applied the methodology used by Biddle *et al.*, (1997) on the data of 110 Australian companies over the period 1992-1998 to examine whether EVA is more highly associated with stock returns than conventional accounting-based measures: namely, earnings before extraordinary items, net cash flow from operations and residual income. The five components of EVA examined includes Net Cash Flows, Operating Accruals, After-Tax Interest, Cost of Capital and Accounting Adjustments. Relative information content tests reveal returns to be more closely associated with earnings than residual income, net cash flow and EVA respectively. However, consistent with the construction of EVA, incremental information content tests suggest that EVA adds more explanatory power to earnings than either net cash flow or residual income. An analysis of the components of EVA confirms that the capital charges and GAAP related accounting adjustments most closely associated with EVA add more explanatory power to net cash flow than accruals or after-tax interest, though these measures are relatively more significant alone in explaining market returns.

Sparling and Turvey (2003) revisits the relationship between EVA and shareholder return and reexamine the evidence and issues surrounding the use of EVA as a tool for valuing investments. Using the Stern Stewart Fortune 1000 data, they examine two potential relationships for 33 food companies listed in the database. The first is between the absolute level of EVA in 2000 and 3-, 5-, and 10-year shareholder returns. The second is between 3-, 5-, and 10-year mean percentage changes EVA and 3-, 5-, and 10-year shareholder returns. The correlations found were extremely weak in all instances tested. The results of the study refute the claim of EVA proponents about its superiority.

Tortella and Brusco (2003) using an event study methodology, has analyzed the market reaction to the adoption of the EVA technique. Using a sample of firms adopting EVA during the period 1983–1998, we do not observe a significant market reaction to EVA adoption. The result appears to be in conflict with some other studies (O'Byrne, 1997) that observe that EVA companies have high levels of stock market returns. This difference is probably due to the fact that the explosion of the EVA technique occurs in the middle and the second part of the 90s, coinciding with a strong stock market. Probably, the positive stock market evolution observed in these studies can be attributed to the stock market tendency and not to the EVA properties. Results are in the line of Chen and Dodd, 2001; and Biddle *et al.*, 1997. Both papers observe that the market price evolution may rely more on audited accounting earnings than on the non-audited EVA. Additionally, study also analyzes how the company profile revolves around the EVA adoption. Firm performance variables, investment variables, and cash flow variables were analyzed. In the first set, they observe that firms usually adopt EVA after a long period of bad performance. After the adoption, performance measures appear to improve only in the long run, a result probably influenced by the favorable evolution of the general economic situation. Analyzing firm investment variables, we observe that EVA adoption increases firm investment activity. A positive impact on the Cash Flow Margin and the EBITDA after the adoption was found .This may be due to the fact that managerial compensation depends positively on these variables.

Griffith (2004) assesses the performance of companies that have implemented the EVA-based compensation system and questions whether analysts should use EVA performance to forecast stock performance. Investors in EVA adopters or in firms for which EVA has been used to forecast stock performance would have suffered significant losses adopted EVA as a measure of firm performance. Results of the study conclude that before the firms adopted EVA as measures of firm performance, underperformed both their peers and the market. After implementation of the EVA compensation system, the companies continued to underperform significantly. The findings also bring into question the value of EVA and MVA as research tools, and neither is a good indicator of performance.

Palliam (2006) analyze and test assertions that Economic Value Added (EVA) is more highly associated with stock returns and firm values than accrual earnings, and evaluates which components of EVA, contribute to these associations. Thirty three non-EVA users and 75 EVA users were selected at random. Variables used in this study were revenues, profits, assets, stockholders' equity, market value, earnings per share, total return to investors, and percentage cost reduction over time. The findings of the study suggest that EVA is a relatively poor predictor of stock performance and enhanced shareholder. The study found that there is little or no relationship between shareholder returns and a firm's EVA. Furthermore, the study found minimal evidence of a difference between the market returns of firms that use EVA compared to firms that do not use EVA.

Ismail (2006) found that Net Operating Profit After Tax (NOPAT) and Net Income (NI) outperform EVA and Residual Income in explaining stock return. The relative information content test results pointed out that NI and NOPAT outperform EVA and RI in their association with stock return. Incremental information content tests of EVA components revealed that all the components are highly significant but the one unique to EVA (Accounting Adjustments) has less incremental information content than the others (Accruals and OCF).

Kyriazis and Anastassis (2007) investigated the relative explanatory power of the Economic Value Added (EVA) model with respect to stock returns and firms' market value, compared to established accounting variables (e.g. net income, operating income), in the context of a small European developing market, namely the Athens Stock Exchange, in its first market-wide application of the EVA measure. Relative information content tests reveal that net and operating income appear to be more value relevant than EVA. Additionally, incremental information tests suggest that EVA unique components add only marginally to the information content of accounting profit. Moreover, EVA does not appear to have a stronger correlation with firms' Market Value Added than the other variables.

Ismail (2008) provides evidences regarding Economic Value Added (EVA) and company performance in Malaysia. The study sought to explain the ability of EVA, compared to traditional tool, in measuring performance under various economic conditions; pre-economic crisis, during economic crisis and post-economic crisis period. This study found that traditional tools particularly EPS is able to correlate and had a relationship with stock return and this study revealed that EVA also able to correlate with stock return and it is superior in explaining the variations of the stock return as compared to the traditional tools under varying economic conditions. The results state that a component of EVA was not had a better relationship with stock return than EVA. While, this study indicates that EVA had a better relationship with stock return over a longer period of the study. The finding revealed that neither positive EVA (value creators) nor negative EVA (value destroyers) had a relationship with stock return. However, the positive EVA (value creators) had a better relationship with earnings than negative EVA (value destroyers) and this study indicates that value creators have better earnings multiplier than value destroyers.

Lee and Kim (2009) introduce Refined EVA (REVA) to the hospitality industry and compare it to EVA, Market Value Added (MVA) and other traditional accounting measures (i.e., Cash Flow From Operations (OCF), Return On Assets (ROA), and Return On Equity (ROE) on market adjusted returns from each of three hospitality sectors (i.e., hotel, restaurant, and casino) and the total (all three hospitality sectors). According to the findings, REVA and MVA are, apparently, valuable performance measures for evaluating hospitality firms. Results conclude that traditional accounting performance measures (i.e., CFO, ROA, and ROE) do not explain much of market adjusted return after considering REVA and MVA. One of a few exceptions is that ROA shows a positive explanatory power only in the hotel sector. The study provides interesting and meaningful findings that REVA and MVA can be considered good performance measures throughout the three hospitality sectors (i.e., hotel, restaurant and casino). According to the findings, REVA and MVA significantly explain the market adjusted return by presenting positive coefficients.

Shubita(2010) using the data of 39 companies listed on Amman stock exchange examine the information content of EVA, Residual Income, and accounting earnings measures. Using methodology similar to Biddle *et al.,* (1997) and applying panel data regression, researcher examined the value relevance of EVA and conventional measures in explaining the stock returns. The results of the study conclude that EVA does not significantly outperform NI and NOPAT, and sometimes it does not even outperform RI. Therefore, relative information content tests refute the claim of EVA proponents that EVA is by far the best financial metric that explains stock return. Similar to Chen and Dodd (2001), author suggests that there are other non-earnings and non-EVA factors that drive share value and these should be taken into account either for shareholders' value creation or for performance measurement and management compensation.

ArabSalehi and Mahmoodi (2011) examine assertions that Economic Value Added is superior as a performance measure compared to traditional accounting measures in explaining stock returns in Iranian companies. Using a sample data of 76 companies listed on Tehran stock exchange, both relative and incremental information content approaches were examined using panel data regression method. Relative information content tests revealed that stock returns are more closely associated with ROA, ROE and EPS than EVA. Moreover, the incremental information content tests indicate that EVA adds only slightly to information content beyond accounting measures. However, the results suggest that accounting measures generally outperform EVA. The results of the study are consistent with Biddle *et al.*, (1997); Worthington and West (2001); Chen and Dodd (1997, 2001); Maditions *et al.*, (2006, 2009); Ismail (2006); and Lee and Kim (2009) who revealed that accounting-based measures outperform EVA.

2.5 ROLE OF PERFORMANCE MEASURES IN COMPENSATION MANAGEMENT AND FIRM VALUE

Stern (1990) has pointed out that the concept of EVA is better equipped than any other measure to gauge the financial performance of an enterprise. EVA is a performance measure which is most closely linked to the creation of shareholders' wealth over a period of time. The financial management and the incentive compensation system based on EVA gives the manager superior information and higher motivation to make decisions that will create the greatest shareholder private enterprise. Accordingly, EVA should be made the focal point for reporting, planning and decision making. The managers may be guided by EVA and pursue such objectives that improve operating profits without investing more capital. Managers can be paid a percentage of both the total EVA and the change in EVA.

Burkette and Hedley (1997) elucidated that the Economic Value Added concept can be used to assess organizational performance known as economic profit, which is useful for profit making companies, public sector organizations and non-profit organizations. EVA is being used by these entities in different ways, including management communication base, as a measure of corporate and divisional performance, to tighten management, stockholder interests, and to emphasize the long term benefits of industrial research and employee training. The profit can be calculated by determining the company's cost of equity capital, the weighted average cost of the firm, the adjusted operating income, the operating income plus back expenses providing a future benefit, assets employed on a book basis, the capital investment, and the difference between the readjusted operation and the capital charge.

Todd (1997) expressed that EVA is a better compensation measure than NPV because EVA is a flow measure whereas NPV is a stock measure. The author stressed on the use of measures that can be computed periodically as they are realized (i.e. a flow measure). EVA also takes into account the cost of capital and the amount of capital invested in the company. Thus, EVA is more useful than another flow measure (i.e. cash flow).

Young (1997) discusses the growing popularity of Economic Value Added (EVA). It explains why managers are turning to EVA as a performance metric, how EVA is used by companies, and the problems that typically arise in implementing it. The accounts of Rhone-Poulenc are used to demonstrate the calculation and interpretation of EVA numbers. Analysis of Rhone-Poulenc suggests that an outsider measuring EVA needs to make several simplifying assumptions to cope with the inherent limitations of public disclosure. Other problems arise when implementing EVA inside the firm. He concludes that EVA is an improvement over the performance metrics that came before it. With the rising demands on managers in Europe and elsewhere to deliver value to shareholders, the number of companies using EVA or similar metrics will certainly multiply in the coming years.

Robertson and Batsakis (1999) empirically examined the role an organization's characteristics may play in determining the emphasis on executive share options within the compensation system. They found that share options are viewed from an organizational perspective to be an effective behavioral control mechanism. They also found that investors respond favorably to the adoption of an EVA-based compensation plan, and that a flow-on effect would be that investors view increases in EVA more favorably than improvements in traditional accounting based performance measures.

Goldberg (1999) considers the role of EVA in performance and compensation measurement. In this article, EVA is compared to earnings and return on equity as measures and motivators of performance. The underlying theoretical support for EVA is reviewed. Recent research on EVA is summarized. The study raises questions about whether EVA is superior to GAAP-based accounting measures of value. The results of study are consistent with compensation based on residual income measures motivating managers to increase corporate value.

Riceman *et al.*, **(2000)** examine whether managers on EVA based bonus plans outperform managers on traditional accounting based bonus plans. The results suggest that managers on EVA bonus plans who understand the EVA concept perform better than managers on traditional bonus plans. However, we find some evidence that the increase in performance results from increased consistency or congruence in the manager's evaluation-reward process rather than from superiority of EVA as a performance measure. Also, we find that the effect of EVA bonuses and EVA understanding differs depending on the area of the firm in which the manager is employed. This suggests that EVA may not be a universally appropriate base for reward systems.

Malmi and Ikaheimo (2003) bring out the importance of Value Based Management (VBM) especially of EVA, which has attracted considerable interests among organizations in recent years. These concepts can be applied to capital budgeting, valuation, management control, and incentive compensation. Despite the growing number of applications, we have only limited independent research-based evidence on how these concepts are actually applied. With the aid of six Finnish-based organizations from five different industries, they illustrate the diversity of actual use of VBM. Our results indicate that for some organizations VBM is merely rhetoric, while for others it seems to have an impact on both decision making and control system, taking various forms from one firm to another. In some organizations, application of VBM is restricted only to the highest levels of hierarchy, whereas in others it covers the whole organization. However, in none of the studied organizations is VBM applied in as comprehensive a manner as suggested in the normative literature.

Liao *et al*., **(2005)** discusses the role of performance indicators and argued that it is basic step to choose an evaluating indicator of operating performance when designing an incentive system. Whether the index is proper or not will have a direct effect on the effectiveness of the incentive system. EVA is a good evaluating indicator that is adopted by many big multinational corporations and that has led the trend of the development in this area. So it will also become our choice in the future. But before introducing EVA into China, we must have an all-round cognition of it. The study carefully analyses the advantages and disadvantages of this evaluating indicator from a unique angle in order to find some enlightenment for our state-owned enterprises.

Irala (2005) find that EVA stories in the west are quite encouraging; empirical research is not sufficient for establishing the claim of EVA as a better measure. There is also not much research to prove it otherwise. In the case of India either way research is very inadequate. Although not a panacea, EVA based compensation plans will drive managers to employ a firm's assets more productively and also to reduce the difference in the interest of managers and shareholders, if not, perfectly align them.

2.6 MISCELLANEOUS ISSUES

Jain (1994) discusses that value added statements has certain advantages like comparison of performance, productivity measurement, resource allocation and incentive schemes for employees. The value added approach shows how the corporate pie has been divided among various contributors of value.

Ochsner (1995) observed that through Economic Value Added one can examine the company's financial results in economic language. He also describes the annual constituent of free cash inflows minus total capital expenses. The methodology which is over 50-years old becoming popular once again because it is not an accounting based approach which mangers may have found unreliable. Moreover, EVA technique is making a comeback because they can judge better whether a firm is generating economic returns. This capability of EVA technique to have such record of companies satisfies the investors. In addition, EVA can be used as a tool for assessing financial performance. This performance measure also has a negative aspect that makes it undesirable to some managers, who accept the fact that EVA uses software in computing financial results, resulting that the managers are not knowing about the deviation of performance.

Booth (1997) observed that Economic Profit should be a part of company's performance measurement structure. Value based management and shareholders' value analysis have been well known concepts in 1980s. However, recently, there is a transformed interest in them and also the newer related concept of EVA. Previously many corporate strategies were criticized for destroying rather than creating shareholders' value. A device which can be used to reduce this risk is to build an analysis of shareholders' value into selection of corporate strategy.

Rogerson (1997) investigated the moral hazard that exists with managers to increase shareholder wealth and to thereby increase the firm's cash flows so as to increase managerial compensation. They concluded that Residual Income or EVA as a performance measure will ensure that managers will always make efficient investment decisions.

Tully (1997) disclosed that EVA is a method for understanding that what is happening to the financial performance of an organization. The paper presents the method for calculating EVA, and also shows some graphic presentations of EVA's of several companies like Bajaj Auto, Asian Paints, Procter and Gamble (India) Ltd., Siemens India. It has been concluded in the paper that EVA can be a better financial performance evaluation measure than other traditional measures.

Weissenrieder (1997) criticized Economic value added (EVA) as it is based on accounting items. He argued that accounting measures will not any longer be a sufficient provider of financial information. Companies will experience a demand for more precise tools, both when it comes to metrics and the tool's ingredients (relevance) due to the increasing activity among shareholders/investors and opined that financial managers might be compelled to act on information that is accounting in disguise & might have serious consequences. He compared EVA with Cash Value Added (CVA) and concluded that the latter is a better performance measure.

Saksena (1998) revealed that there is no single method that is totally perfect to measure financial performance. Thus, a method should be such that satisfies shareholders' expectations and is also being committed by top management. EVA is a measure that should be used by top management to evaluate investment centre managers, because it considers goal similarity between shareholders and manages.

Pattanayak and Mukherjee (1998) found in his study that there are traditional styles to measure corporate income which are known as accounting concept, and there are also some modern styles to measure corporate income which are known as economic concept. EVA, which is based on economic concept, is apparent to be a superior technique to identify whether the organization's NOPAT during a period is covering its WACC and generating value for its owners. But it is very complicated to calculate EVA of a company. Companies trying to implement EVA are asked to incorporate 164 amendments to their financial accounts.

Brewer *et al.*, **(1999)** have highlighted the various advantages, uses and limitations of Economic Value Added. They conclude that EVA can provide a valuable measure of wealth creation and can be used to help align managerial decision making with firm preferences; however, it is only one piece of the performance measurement puzzle and it must be used in conjunction with a balanced set of measures that provide a complete picture of performance.

Anand *et al.*, **(1999)** noted that EVA, REVA (Refined Economic Value Added) and MVA were better measures of business performance as compared to NOPAT and EPS in terms of shareholders' value creation and competitive advantage of a firm. Since conventional management compensation systems emphasize the growth of sales/asset at the expense of profitability and shareholders' value. Thus, EVA is a measure that shifts focus on an organizational culture of concern for value.

Jensen and Meckling (1999) argue that, even though many companies use ROE, it is susceptible to manipulation when managers have rights to make decisions over the level of investment. They recognize the use of EVA, but clearly indicate that it is also not the best measure. This is because projects with negative EVA in early years will not be chosen if managers are evaluated on current EVA figures, even though the future annual EVA is enough to justify the investment.

Singh (1999) tried to provide a new framework of decision-making based on EVA and BPR. Both of these technological models have gained a lot of attention of corporate managers in the fortune 500 companies but still a lot needs to be done. Many of the finance managers in India are unable to properly appreciate the potential of EVA and BPR. Although, Indian corporate sector has slowly started giving recognition to these critical concepts of success in the light of competitive global village but it seems that it may take a few more years for the corporate executives to realize the potential of the buzzwords of 21st century. It can be concluded that maximizing the value of shareholders is the prime concern of any business organization, and it should be kept in mind that change is the only thing, which is permanent in nature. Obliteration should be welcomed if it is for the better and the managers of public organizations should take decisions as if it is a private organization so that the capital is optimally utilized and may result in maximizing the shareholders' wealth.

Young (1999) argues that adjustments recommended by EVA proponents make economic sense, but, as a practical matter, questions whether it is worth making the adjustments. EVA measurements are intended to adjust GAAP-based accounting performance measurements to economic basics in which value is determined by net cash flows discounted to present value using the weighted average cost of capital for the discount rate. It is argued that many accounting adjustments distort what is being measured away from cash flows valued by the market. Young indicates there are up to 150 possible adjustments, but six or fewer have become the norm. He argues that firms are backing off from larger numbers of adjustments because managers are reluctant to get too far away from GAAP, and adjustments tend to have little impact on performance metrics.

Durant (1999) describe that EVA is both a measure of value and also a measure of performance. The value of a business depends on investor's expectations about the future profits of the enterprise. Stock prices track EVA far more closely than they track earnings per share or return on equity. A sustained increase in EVA will bring an increase in the market value of the company. EVA focused companies concentrate on improving the net cash return on invested capital.

Saha (2000) observed that liberalization of the Indian economy over the last ten years had lead to a shift in the corporate goal of the public and private corporate in the country. Earlier it was mandatory for their goal to have a socio-economic focus. There is a major change with the focus now being primarily on enhancing the shareholders' value in a company. He examined the different ways of ascertaining shareholder value and recommended shift from Earnings Per Share, Price Earnings Ratio, etc. to Economic Value Added and Market Value Added and demonstrated how EVA was the best measure for measuring shareholders value enhancement.

Phani and Bhattacharya (2000) discuss the concept of Economic Value Added (EVA) that is gaining popularity in India. They examines whether EVA is a superior performance measure both for corporate reporting and for internal governance. It relied on empirical studies in U.S.A. and other advance economies. It concluded that though EVA does not provide additional information to investors, it can be adapted as a corporate philosophy for motivating and educating employees to differentiate between value creating and value destructing activities. This would lead to direct all efforts in creating shareholder value.

Isa and Lo (2001) discuss that EVA has gained significant attention as an alternative to the traditional accounting measures for assessing corporate performance due to its transparency and capacity to provide more vital information. It is hoped that the introduction of this tool will help investors in Malaysia make better investment and allocation of resources decisions.

Girotra and Yadav (2001) describe and compare the EVA with other measures. The advent of this concept has provided flexibility to the management in measuring the performance of their business operations Apart from this, taking the real financial data of an Indian company, the paper shows how EVA calculations can be done to demonstrate whether the company is adding to shareholder value by generating profits over and above the capital charge. EVA is not a tool to create wealth. Yet, it encourages managers to think like owners and, in the process, may impel them to strive for better performance.

Acheampong and Wetzstein (2001) concluded that Value-added measures are useful information for managers in that with this information, managers have a guide to help them in decisions that lead to value creation. However these measures are not significantly different from traditional measures of performance and must not replace them. Value added measures can be used along with traditional measures when it is necessary.

Keys *et al.*, **(2001)** discuss Economic Value Added (EVA), a financial measure introduced by the consulting firm Stern Stewart & Company., which claims that EVA is the only true indicator of business and management performance. They briefly explain how EVA is calculated and demonstrate that EVA is identical to residual income, an older financial measure largely abandoned by U.S. companies years ago. Yet EVA is by no means the panacea that some authors have suggested. This is demonstrated by showing inconsistencies in definitions of EVA and various general limitations of using EVA. Companies that use EVA should understand the inconsistencies involved, and then take the limitations of EVA explicitly into account.

Worthington and West (2001) provide a synoptic survey of EVA's conceptual underpinnings and the comparatively few empirical analyses of value-added performance measures. Special attention is given to the GAAP related accounting adjustments involved in EVA-type calculations. When examining existing theoretical and empirical research in this area, a number of salient points emerge. First, despite the relatively recent adoption of EVA as an internal and external financial performance measure, its conceptual underpinnings derive from a well established microeconomic literature regarding the link between firm earnings and wealth creation. Second, the GAAP-related adjustments themselves accordingly comprise the most unique and contentious aspect of EVA. Third, the empirical evidence concerning EVA has been mixed. Nevertheless, the bulk of empirical evidence indicates that the superiority of EVA vis-a-vis earnings (as variously defined) has not been forthcoming.

Bardia (2002) described that the concept of EVA has made a status in the mind of investment analysts as a tool of measuring corporate performance. In a dynamic corporate environment a common investor finds it increasingly difficult to monitor his investments. It is claimed that EVA is the sole method of accounting various dimensions by which a company's value may be added or eroded. In fact the method emphasizes the quality of earning and not just the quantity. As a matter of fact the number of companies adopting EVA as a tool of performance measurement is increasing sharply in India.

Lovata and Costigan (2002) provide empirical evidences on Economic Value Added by classifying firms into prospectors and defenders. Prospector firms are defined as firms that apply a differentiation strategy while defender firms focus on being cost-leaders. Firms identified as prospectors should be less likely to use EVA. One hundred and fifteen firms were identified as being adopters of EVA. Logistic regression was performed to contrast these firms to a control group of 1,271 non-adopters. The results indicate that firms using EVA exhibit a higher percentage of institutional ownership and a lower percentage of insider ownership than non-adopters. Prospector firms as defined by a higher ratio of research and development to sales tend to use EVA less than defender firms. Accounting adjustments are a focal point of the EVA formulation and the results presented in this study suggest that providing appropriate incentives may be more complex than the developers of EVA imply.

Mohanty (2004) addresses various criticism alleged on EVA and summarized that EVA is actually a cash flow-based performance measure of the company as against the popular belief that EVA does not seem to capture the effect of either of expected return as it is based on book value. To be precise, EVA is the excess free cash flow that the management generates to meet the expectations of the investors. He recommends a modified measure based on EVA and TVA (True Value Added) that addresses various criticism of EVA. He argue that modified measure not only address the above shortcomings of an EVA-based management compensation system, it can also address some of the shortcomings of Employee Stock Option Program (ESOP) based management compensation system.

Lloyd (2005) describe and analyze the adoption of Economic Value Added (EVA) income as a benchmark for setting pricing and other policies of a monopolistic state-owned enterprise in the absence of normal benchmarking mechanisms. With the help of case of Airways corporation of New Zealand Limited author provides evidence that the enterprise was successful in avoiding charges of monopolistic pricing and subsequent regulation by linking pricing and other policies to its economic results. During the same period enterprises were regulate or threatened with regulation. It provides a useful way to benchmark profits where a monopoly position may attract regulation.

Pandey (2005) empirically explores the significance of profitability and growth as drivers of shareholders value, measured by the market-to-book value (M/B) ratio. Profitability is defined in terms of economic profitability or spread, which is difference between Return On Equity (ROE) and Cost of Capital (K_e). Accounting profitability, defined in terms of ROE, does not consider cost and risk dimensions. Using panel data of 220 Malaysian firms for the period of 1994-2002, study empirically explore the effect of profitability and growth on the shareholder value. Employing GMM estimation, findings showed that there existed a strong positive relationship between economic profitability and M/B ratio. Growth was negatively related to M/B ratio. However, the economic profitability-growth interaction variable had a positive coefficient indicating that growth associated with profitability influences shareholders value positively. Finding of the study was further supported when author analyzed the relationships separately for the positive spread firms and negative spread firms. Study also indicated negative relationship between M/B and firm size and positive relationship with business risk, financial risk and capital intensity.

Anderson *et al.*, **(2005)** analyzes the role of adjustments in EVA calculations. A major consideration in the application of EVA is the adjustment of a large number of accounting variables ranging from accounting income and accounting capital to economic income and economic capital. However, there is no economic theory to guide the selection or the adjustment of the most relevant accounting variables which are dependent on the financial structure and nature of the given firm. The objectives of this research are to determine: (1) whether the suggested adjustments, given the approximately steady state nature of many firms, are even significant, (2) which accounting adjustments are most critical, and (3) what is the impact of accounting adjustments on the residual income or simply after-tax operating income less a charge for the capital employed in the operations. They find that the impact of the primary adjustments is inconsistent from year to year and is, in general, insignificant. Given the high degree of variability from year to year, the use of EVA as a basis for compensation or as a measure of corporate wealth creation is limited.

Ray and Choudhuri (2005) discuss uses and limitations of Economic Value Added. It also elaborates how to use EVA to evaluate performance of a company with the detail description of adjustments required for calculation. They concluded that EVA can provide a valuable measure of wealth creation and can be used to help align managerial decision making with firm preferences; however, it is only one piece of the performance measurement puzzle and it must be used in conjunction with a balanced set of measures that provide a complete picture of performance.

Ghanbari and Sarlak (2006) made it clear that maximizing shareholders' value is fast becoming a corporate standard in India. EVA is an appropriate performance measure, which evaluates the manner in which managerial actions affect shareholders' value. EVA is a tool for determining whether the management of the company has created wealth or destroyed it. The study reviews the trends of EVA of Indian automobile companies and results indicate that there is strong evidence to support Stern-Stewart's claim that EVA is superior to the traditional performance measures, and it is the best internal measure of corporate success in adding value to shareholders' investments.

Pitabas (2006) argues that contrary to popular perception, EVA is actually the excess free cash flow the company generates to meet the expectations of the investors. In this sense, it is not only a cash flow based measure, but also positively associated with the return the investors get on their investment in the company. The study recommends an alternative performance measure that addresses some of the limitations of both the traditional EVA-based and Employee Stock Option Program (ESOP) based performance measurement system.

Rakshit (2006) with the help of case study of Dabur India limited discusses that EVA based performance measurement system is the basis on which the company should take appropriate decisions related to the choice of strategy, capital allocation, merger & acquisitions, divesting business and goal setting. While deciding resource allocation it becomes necessary to appreciate the EVA impact of such decision. Management Accountants have the full knowledge about the company that would create value. They are in a position to guide a company in its restructuring mission for value creation. So a Management Accountant is expected to successfully transform traditional management system into value based management system.

Desai and Ferri (2006) discuss EVA as a performance measurement and management tool. They highlighted that EVA metrics provide managers with a powerful tool to weigh investment and spending decisions against capital requirements and investors' expectations. EVA implementation is not without costs and limitations. The method must be carefully applied to ensure that it is measuring economic effects properly and does not create time-horizon distortions. These refinements, however, can make it complex for managers to understand and for firms to administer. In their final analysis they concluded that EVA is a measurement technique that can provide for improved decision making and firms must understand the value that EVA can bring to the decision-making process.

Pal and Sura (2007) presents a review of around 40 research studies on EVA's conceptual underpinnings and its empirical and theoretical analysis and traditional performance measures with the aim of finding the relationship between shareholders value and various performance measures and plugging the gap. The result of this paper offer that according to practitioners EVA dominates traditional measures in explaining stock return and firm value; but academician found traditional measures too equally important in explaining market value of shares. The study also provides directions for future research on Economic Value added.

Sharma *et al.*, **(2007)** examine the economic significance of using a blended business and knowledge strategy through the lens of conventional financial management before and after the implementation of knowledge management initiatives in a knowledge-intensive, high-growth firm. Economic Value Added (EVA) method is proposed as a measure of the effective usage of capital funding in the firm before and after its KM program. The extent of the economic impact due to the contributions of various KM strategies was analyzed using standard financial management reporting. The EVA method was found to be valid and credible in determining the net impact of various KM initiatives. They conclude that EVA does not only serve as a good proxy as a valuation of Intellectual Capital(IC) but can be further used as an objective measure for KM initiatives.

Bardia (2008) examine performance of Infosys Technologies limited and Satyam computer services limited using traditional performance measures such as Return On Capital Employed (ROCE), Return On Equity (ROE), Earning per Share (EPS) and Growth in EPS along with a new performance measure called 'Economic Value Added' (EVA). The study examine whether the selected companies have been able to create value for their shareholders. Infosys proved to be more consistent in creating value and returns for its shareholders. The study concluded that the financial performance of Infosys is much better than Satyam from all different parameters of financial analysis.

Kaur and Narang (2008) put forward that fundamental premise of capitalism is that companies are expected to take financial capital from shareholders and make it worth more. 'Maximizing shareholder value' is a popular refrain in the corporate world today. In India, only a few companies like HUL, Infosys Tech. Ltd., Satyam Computers Ltd., Hero Honda etc., go about measuring their shareholder value, although they don't calculate it scientifically. The present study is an attempt to analyze and compare the EVA statement as disclosed by Satyam Computer Services Ltd., and the actual EVA created by it after considering all the adjustments given by Stern Stewart & Company, the founder of EVA concept. In addition, the study also compares the financial performance of Satyam as depicted by the traditional performance parameters like ROCE, RONW, EPS, Growth in EPS, with the new value-based performance measure called EVA. The study concludes that traditional measures do not reflect the real value of shareholders wealth and thus EVA has to be measured scientifically to have a real idea about shareholders value.

Tomas and Rima (2008) have emphasized the role of performance measures in changing business environment with focus on value added. A number of competing measures have been developed and marketed by investment and consulting firms. This study considers the ways in which value can be created or destroyed in a firm and looks at how to calculate the cost of capital used to measure the opportunity cost of investing funds in one particular business instead of others with equivalent risk. Four most widely used value enhancement measures including Economic Value Added, Cash Flow Return on Investment, Market Value Added and Cash Value Added are discussed and used an example to think of where these approaches yield similar results and where differences might occur. In conclusion, they summarize the new or unique points in these competing measures, establish the information they can give and explain how to use it when managing and creating shareholder value.

Lin and Zhilin (2008) presented an integrated EVA performance measurement (IEPM) model. The superiority of IEPM model to traditional performance measurement was empirically analyzed with data from China's listed companies. The results showed that the measurement ability of IEPM model was superior to that of traditional performance measurement. Its prediction ability was also proved to be better than that of traditional measurement. It suggests that introducing EVA to performance measurement well reflects the company's real profit. So it is effective and reasonable to use IEPM model to evaluate and predict the company's performance.

Mittal *et al.,* **(2008a)** with the help of a case study , presented the process of implementation of an Economic Value Added (EVA) framework in Godrej Consumer Products Limited (GCPL), a leading Fast Moving Consumer Goods (FMCG) company in India, and the challenges faced by the company. It covers in detail the reasons for implementing the EVA framework in GCPL and the benefits derived by the company from it in the form of the SWOT analysis. It is shown that there is a positive link between the implementation of an EVA framework and improvement in the financial performance of a company.

Mittal *et al.,* **(2008b)** analyzed the link between good financial performance measure and other indicators of corporate responsibility in Indian companies. Research findings indicate that there is positive relationship between corporate social responsibility (CSR) and company's reputation but such relationship has not been explored in the Indian context. CSR level of business firms in India is increasing in terms of both amount of the disclosure and the number of participating firms. The findings further indicate that has been reported that there is little evidence that companies with a code of ethics would generate significantly more economic value added (EVA) and market added value (MVA) than those without codes.

Shil (2009) highlighted that Economic Value Added (EVA) is a value based performance measure that gives importance on value creation by the management for the owners. Profit maximization as a concept is age-old, wealth maximization is matured and value maximization is today's wisdom. He highlighted the various merits of EVA over traditional accounting performance measures. The methodology used is a type of theoretical mining of logics resulting into a step-by-step process required for EVA implementation. As corporate house plans to move from traditional to value based performance measures, it would yield good result.

2.7 RESEARCH GAP AND CONCEPTUAL MODEL FOR THE STUDY

2.7.1 Research Gap

Careful analysis of literature pertinent to relationship between corporate financial performance measures and stock returns reveals mixed evidences. In some studies value based measures such as EVA seems to superior in explaining the market value or stock returns, whereas some studies advocate the superiority of traditional performance measures such as ROE, ROI, EPS, DPS etc. There is still controversy about "*whether* it really better to use value- based measures than traditional accounting performance measures the financial performance of the companies or which measure best explains change in market value of the corporations". Most of studies conducted on the relationship between EVA, traditional performance measures are from developed countries majority of them from USA. The hypotheses about the relationship of value based measures and stock returns or MVA mostly have been tested in the developed countries and results are controversial and mixed in nature. Very few studies are undertaken to test the similar hypotheses in developing and emerging markets especially about India. There exits gap in the literature and thus form the basis of conducting the study in India. Worthington & West (2004) suggested that in order to conclude the superiority of value based or conventional performance measures, there is an obvious requirement to examine the usefulness of EVA vis-a vis traditional financial performance measures in an alternative setting, particularly in emerging economies where capital is scare and establish empirical validity of performance measures to be used as assessing corporate measure.

Literature Studies reviewed by researcher on corporate performance measures reveal that various studies have used different traditional accounting measures to compare them with EVA and thereby reporting mix empirical evidences. There is no unanimity in the literature about the performance measures to be used for the purpose of establishing the link with market value and thus form the rational to further investigate the existing relationship between corporate financial performance measures. Careful examination of studies on efficacy of various performance measures analyzed till date have used limited number of traditional and value based measures in examining their relationship with shareholders wealth. Popular studies by Biddle *et al*., (1997); Chen & Dodd (1996, 2001); Worthington & West(2004); Ismail (2006); and Maditions *et al*., (2006 & 2009) have used only three- four traditional performance measures along with EVA in their empirical examination. Kim(2006) suggested that inclusion of other traditional performance measures such as ROCE, RONW and EPS, ROA could be used in future studies to establish empirical validity of these measures and making comparison with EVA. Further, Chen and Dodd (1997) while admitting the limitations of their study recommended that inclusion of some other performance measures with EVA may produce a better comparative assessment on the efficacy of traditional and value based performance measures. Similarly Erasmus (2008) suggested that a large number of traditional measures may be included for future studies. This gap in the existing literature make a strong case for conducting study incorporating above suggestions in the research design of the present study.

Many popular studies as examined above, till date have used stock returns as dependent variable to analyze the efficacy of value base and traditional measures. Few studies reported in this chapter also used MVA as dependent variable but such are very less in number and particularly no empirical evidence is available about emerging economies. Erasums (2008); Moeinadin *et al.*, (2011); Maditions *et al.*, (2009) suggested that in future studies, dependent variables that are calculated as surplus stock returns could be considered and they suggested MVA is such measures which could be replaced by stock returns to establish empirical validity of MVA with corporate financial performance measures. MVA could be a better proxy of stock return as Indian market is in semi- strong form and MVA is a better measure as it clearly reflects the surplus available to shareholders. This makes a ground to analyze the relationship of MVA with corporate financial performance measures and provide empirical evidence about Indian market.

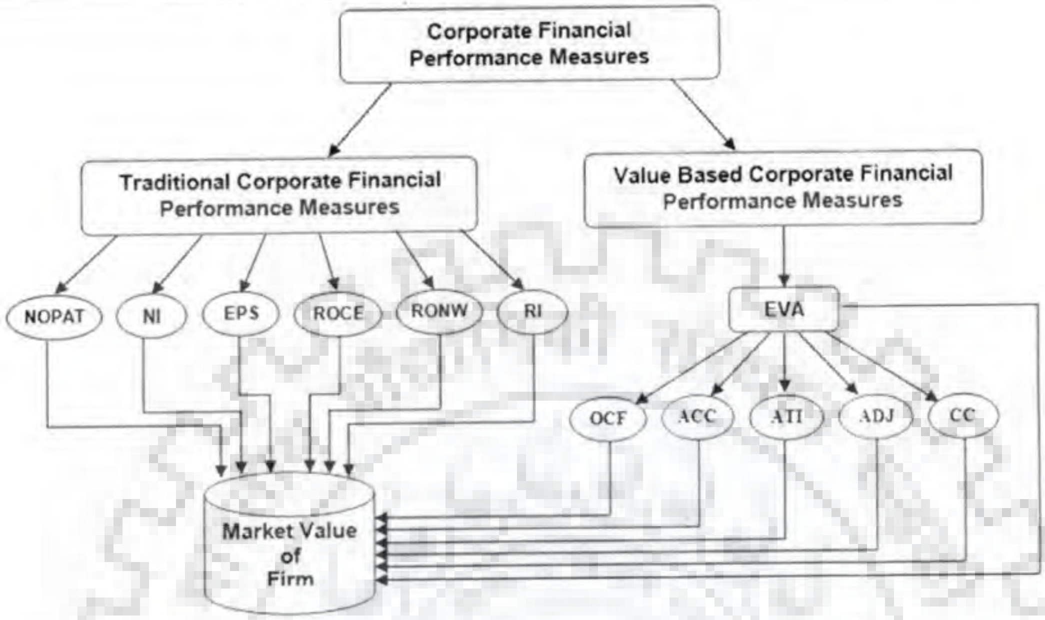
From the literature review, it can be observed that majority of the studies have examined the efficacy of various performance measures at aggregate level. Very few studies are conducted to examine the efficacy of various performance measures at industry level and examine the difference in the behavior of efficacy of these measures across industry. This is a good case to examine the behavior of value based performance measures in different Indian Industries and rank these measures to find out adoption of industry specific measures for performance measurement and management in Indian industries. Thus, make a rationale for conducting further study and provide industry specific results.

Lastly it can be observed from the literature review is that most researchers in this area have tended to concentrate on either cross-sectional data or panel data with a relatively smaller time period. Examination of EVA and other accounting measures over a longer time frame would allow greater empirical certainty of these corporate financial performance measures and will also contribute to the literature. Thus making rationale for conducting further research and provide empirical evidences.

2.7.2 Conceptual Model

Based on the literature review and critical examination of the earlier studies, a conceptual model is proposed for the present study.

Figure 2.1 Conceptual framework of the study



As discussed earlier main objective of the present study is examine the efficacy of EVA and conventional performance measures in explaining the contemporaneous MVA of the sample companies at aggregate and disaggregate level. The conceptual model presented here is based on the objectives of the present study and the causal relationship between various variables. It is evident from the figure that corporate financial measures are broadly categorized in two types, traditional financial performance measures and value based measures. On the basis of literature it can be found that mainly Net Operating Profit After Tax (NOPAT), Earnings Per Share (EPS) and Net Income (NI) are used as performance measures. In the present thesis, along with NOPAT, NI and EPS, Return On Capital Employed (ROCE), Return On Net Worth (RONW), Cash Flow From Operations (OCF) and Residual Income (RI) are used as traditional performance measures and their association with Market Value Added (MVA) is established. Economic Value Added (EVA) has been used as Value based measures to assess the relationship between EVA and Market value of Indian firm. Further components of EVA such as OCF, ACC, ATI, CC and ADJ are also examined in order to know whether component unique to EVA provide greater explanation to MVA in Indian companies as compared to other components. This association or relationship has been examined using Relative and Incremental information content test as used by popular study on the issue.

2.8 CONCLUSION

In this chapter the literature on Economic Value Added and other accounting performance measures has been reviewed. Whatever literature on EVA does exist can be grouped into three broad categories. The **first** category of academic research focuses on the relationship between EVA and accounting measures of performance, market value, stock price, and/or shareholder returns. The **second**, mainly descriptive in nature, examines what EVA is, how it is computed, and how it is being used, advantages, disadvantages, role of accounting adjustments in EVA and limitations of EVA. The **third area** of research focuses on the association of EVA and Market Value Added (MVA). The main thrust of the research papers appears to be relationship between stock returns, EVA and traditional accounting measures, superiority of various performance measures in terms of association with stock returns as well as with firm value testing relative and incremental information content of EVA and other accounting measures and EVA –MVA relationship. Results of the studies are quite mixed and controversial. Research into the information content of other variables, especially cash flows, has increased because of the apparent limitations in earnings figures, and because of the increased demand for investors and analysts to correctly identify firm values. While accounting profit measures such as Earnings Per Share (EPS), Return On Equity (ROE), Return On Assets (ROA) and Return On Investment (ROIC) are among the most commonly used performance measures, they are often criticized for not taking into consideration the total cost of capital and for being unduly influenced by accrual-based accounting conventions. The overall finding is that any number of accounting-based information sources can potentially influence share prices. The empirical literature, however suggests that earnings generally dominates most than other measures in explaining stock returns, although the more recent literature indicates that earnings should not be relied upon, largely because of its discretionary nature.

As regards EVA- MVA relationship, there is almost settled opinion that EVA is better measures of market value of the companies as compared to traditional accounting measures. Relationship between EVA and MVA is found to be positive and these two EVA is positively correlated with MVA as compared to other accounting based measures. Some authors have even concluded that MVA is nothing but discounted EVA. Broadly speaking, two categories of studies exist. Firstly, those studies which provides evidences in favor of EVA and concludes that EVA is a better linked to Market Value of the firm as compared to traditional accounting measures. The results of studies under this category concludes that correlation between EVA and MVA is highest as compared to traditional or conventional accounting measures such as NI, EPS, NOPAT, ROE and ROA etc. The Majority of the studies fall under this category. Secondly, those studies which are few in number conclude that apart from EVA, Market Value of the firm is better linked to some traditional performance measures. It is believed that apart from EVA, MVA is also one of the value added measure of firm performance as increase in market value contribute to maximizing shareholder's wealth and thus important indicator of firm performance.

But no less important than these issues of EVA and stock returns and EVA – MVA relationship there are some important issues which has attracted considerable attention of researchers on performance measures all over the world. An important area where there are lots of anomalies in EVA literature is role of accounting adjustments in calculation of economic profits. Worldwide there are divergent views about GAAP adjustments and EVA. As EVA is based on the premise of economic profits, which is the only difference between EVA and RI, rather than accounting profits, there is need to convert accounting profits by adjusting various items in the financial statements. Stern- Stewart & company have suggested 164 such adjustments. Over the years various researchers across countries have contributed on the same issue by highlighting the use and importance of various accounting adjustments and provided various evidences on the number of such adjustments to be followed in calculation of EVA.

As regards the role of performance measures and executive compensations, there are mixed evidences about the validity of value based measures and their role in creation of firm value. But some studies clearly points out that companies adopting EVA as base for executive compensations, performance of such adopters have been significantly increased from those who do not have such plans. There are also evidences about managers performing well under stock options plans and in EVA linked compensation system. Role of EVA in reduction of agency cost has been highlighted under some studies. In theory, EVA based compensation plans leads to significant contribution in maximizing shareholder's wealth or value addition but empirical validity of the same may perhaps be questionable. These issues are beyond the scope of present thesis as focus of the present study is to empirically examine the efficacy of EVA and traditional performance measures in explaining the contemporaneous MVA of sample Indian companies at aggregate and disaggregate level.

Notes

1. This management principle, also known under value based management, states that management should first and foremost consider the interests of shareholders in its business decisions. Although this is built into the legal premise of a publicly traded company, this concept is usually highlighted in opposition to alleged examples of CEO's and other management actions which enrich themselves at the expense of shareholders. Examples of this include acquisitions which are dilutive to shareholders, that is, they may cause the combined company to have twice the profits for example but these might have to be split amongst three times the shareholders.
2. Adjusted Economic Value Added (AEVA) is in fact an adjusted EVA variant to inflation. AEVA is calculated by firstly restating the capital base in current values, then determining the asset structure of the company and finally calculating the required accounting return. As a final step, the product of required accounting return and current value of capital is subtracted from Net Operating Profits after Taxes (NOPAT).
3. The Current Operations Value (COV) can also be expressed as the sum of capital invested, plus the present value of current EVA into perpetuity, with no growth. The nominal zero-growth assumption implies decay in real terms.
4. Future Growth Value (FGV), proposed by Stern Stewart & Co, reflects the value of the expected growth of EVA in future. It is the difference between the Market value of the firm and the Book value of the firm together with the current level of EVA- referred to as Current Operations Value (COV).
5. CVA is a registered trademark of FWC AB. developed by Erik Ottosson and Fredrik Weissenrieder. CVA is a measure of the amount of cash generated by a company through its operations. It is computed by subtracting the 'operating cash flow demand' from the 'operating cash flow' from the cash flow statement. Cash value added is similar to economic value added but takes into consideration only cash generation as an opposed to economic wealth generation. This measure helps give investors an idea of the ability of a company to generate cash from one period to another. Generally speaking, the higher the CVA the better it is for the company and for investors.

CHAPTER 3
CORPORATE PERFORMANCE MEASURES

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Preview

This chapter presents at the outset various traditional corporate financial performance measures, their computations, significance and shortcoming of traditional or conventional measures used to assess the performance of companies. It then presents a detailed analysis on the value based performance measures, benefits and rationale of value based performance measures, concept of economic profits and economic value added, growth of EVA, steps in calculation or computation of EVA, various accounting adjustments to convert GAAP profits into Economic Profits, advantages and limitations of EVA and also a closely linked measure to EVA and Market Value Added are discussed in this section.

3.1 INTRODUCTION

Maximizing shareholders value has become the new corporate paradigm in recent years. The companies which gave the lowest preference to shareholders curiosity are now bestowing the utmost preference to it. Shareholders wealth is measured in terms of returns they receive on their investment. It can either be in forms of dividends or in the form of capital appreciation or both. Capital appreciation depends on the changes in the market value of the stocks. The market value of stocks depends upon number of factors ranging from company specific to market specific. However, one factor, which has a significant influence on the market value, is the expectation of the shareholder regarding the return on their investment. The share prices are influenced by the extent to which the management is able to meet the expectation of shareholders. Various measures like Return On Capital Employed, Return On Equity, Earnings Per Share, Net Profit Margin, Operating Profit Margin are used to evaluate the performance of the business. The problem with these measures is that they lack a proper benchmark for comparison. The shareholder requires at least a minimum rate of return on their investment depending on the risk in the investment. Sometimes, the industry average or the competitor's performance may be considered as a benchmark, which may not be acceptable to meet the shareholders minimum expectations. Black *et al.*, (1998) identified following reasons why we need new corporate performance measures:-

1. Global momentum in economy since 1980's
2. Integration of capital markets
3. Transparency and Corporate Governance

4. Change in way organizations are preparing and reporting their financial results
5. Greater awareness among Investors
6. Moving from traditional audit to new trends like quarterly audit/audit committee etc.
7. Changing organizational objective from profit maximization so as to keep their customers, suppliers, communities and shareholders satisfied.

The selection of appropriate performance measures is one of the most critical challenges facing organizations (Knight, 1998) because sometime poorly selected performance measures routinely create the wrong signals for managers, leading to poor decisions and undesirable results. As discussed in introductory chapter, there are hidden costs associated with misused performance measures. Ferguson and Leistikow (1998) rightly mentioned that it is the wrongly chosen performance measures, which in turn push management to take improper decisions resulting into decline in market value of the company.

For over last two decades, there has been significant criticism of how corporate performance is measured and understood. Corporate leaders, shareholder advocates, and academic authors have all pointed out the shortcomings of traditional financial reports for managing accountability and driving performance. They say that the reports tend to be geared toward tax and regulatory matters; they mix controllable and uncontrollable performance factors; they present many investments as expenses; they routinely mix tangible, real value with intangible accounting figures; and so forth. Due to these factors there is a shift from more traditional performance measures to the so-called value based performance measures. The value based performance measures attempt to link the financial results of a firm with the shareholder value created (Stewart, 1994). Proponents of value based measures argue that they provide an improvement over the traditional measures (Lehn & Makhija, 1996). Fabozzi and Grant (2000) suggested that ideally a corporate financial performance measure should have following characteristics:

1. The measure should not be sensitive to the choice of accounting methods
2. The measures should evaluate the firm's current decision considering expected future results
3. The measure should consider the risk associated with the decisions made by the firm.
4. The measure should neither penalize nor reward the company for factors outside of its control, such as market movements and unanticipated changes in the economy.

The corporate financial performance measures can be broadly discussed under two heads: (i) Traditional or conventional performance measures and (ii) Value based measures. This chapter is divided in two parts: ***First*** part is devoted to the discussion about traditional or conventional performance measures and their types, computation requirements in detail and shortcomings and criticisms against conventional performance measures. ***Second*** part provide a description about value based measures with special focus on the concept of EVA, concept of Economic Profits of EVA, its calculation requirements and adjustments required to compute EVA. Finally advantages and limitations of Economic Value Added are discussed along with concept of Market Value Added.

3.2 TRADITIONAL CORPORATE FINANCIAL PERFORMANCE MEASURES

3.2.1 Development of Traditional Performance Measures

Traditional or conventional performance measurement systems such as ROI, ROE and EPS were developed at a time when decision-making was focused at the center of the organization and responsibilities for decision-making were very clearly defined. According to Knight (1998, p. 173) '*these performance measurement systems were designed to measure accountability to confirm that people met their budget and followed orders*'. The description of most commonly used conventional performance measures is presented in this following section.

3.2.1.1 Return On Investment (ROI)

The prime objective of making investments in any business is to obtain satisfactory return on capital invested. Hence, the return on capital employed is used as a measure of success of a business in realizing this objective. Return On Capital Employed establishes the relationship between the profit and the capital employed. It indicates the percentage of Return On Capital Employed in the business and it can be used to show the overall profitability and efficiency of the business.

ROI which is also known as Return On Capital Employed (ROCE) tells us how much profit business earn from the investments the shareholders have made on their company. The Return On Capital Employed (ROCE) ratio, expressed as a percentage, complements the Return On Equity (ROE) ratio by adding a company's debt liabilities, or funded debt, to equity to reflect a company's total "capital employed". This measure narrows the focus to gain a better understanding of a company's ability to generate returns from its available capital base. Return On Capital Employed or ROI consists of two components i.e. Net Profit and Capital Employed. It is calculated as follows:

ROI = Net Profit/ Capital Employed

Return On Investment (ROI) provides a strong incentive for optimal utilization of the assets of the company. This encourages managers to obtain assets that will provide a satisfactory return on investment and to dispose of assets that are not providing an acceptable return. In selecting amongst alternative long-term proposals, ROI provides a suitable measure for assessment of profitability of each proposal. The return on capital employed ratio is helpful in measuring the managerial performance in the following ways:

- It helps in measuring the profitability of the firm
- The actual return on capital employed can be compared with the targeted rate of return
- It indicates how effectively the operating assets are used in earning return
- It can be used as a sensitive gauge of profit making ability of the firm
- Divisional performance measurement can be done easily with ROI
- It helps in making comparison of inter- divisional and inter- firm comparison
- It focuses the attention on efficiency of management in managing the investments made into business
- It correlates the return with various assets used in the business

3.2.1.1.1 Significance of ROI

ROI is considered to be the best measure of profitability in order to assess the overall performance of the business. It indicates how well the management has used the investment made by owners and creditors into the business. It is commonly used as a basis for various managerial decisions. As the primary objective of business is to earn profit, higher the Return On Capital Employed, the more efficient the firm is in using its funds. The ratio can be found for a number of years so as to find a trend as to whether the profitability of the company is improving or otherwise. Return On Capital Employed also indicates whether the company is earning sufficient revenues and profits in order to make the best use of its capital assets. This ratio is expressed in the form of a percentage and the higher the percentage, the better.

3.2.1.1.2 Limitation of ROI

The primary disadvantage of ROI concerns its sensitivity to accounting practices. In the process of simplifying the evaluation of an entire business operation down to profits/ investment, many inexact accounting measurements are combined. Only in rare cases is there one obviously right answer to questions of how to account for transfer pricing, depreciation, allocations of joint costs, etc. Having made a judgment on all such matters, it is possible to create a precise looking ratio often carried out to several decimal places, but the apparent precision that results is in truth an illusion. The ratio may change dramatically if the underlying accounting practices- that were probably not the only defensible alternative in the first place-are changed even slightly (Dearden, 1961, 1969).

Another drawback of ROI is that it measures return against the book value of assets in the business. As these are depreciated, the ROI will increase even though cash flow has remained the same. Thus, older businesses with depreciated assets will tend to have higher ROI than newer, possibly better businesses. In addition, while cash flow is affected by inflation, the book value of assets is not. Consequently revenues increase with inflation, while capital employed generally does not (as the book value of assets is not affected by inflation).

3.2.1.2 Return On Net worth (RONW) or Return On Equity

Return On Net Worth measures the rate of return on the ownership interest (shareholders equity) of the common stock owners. It measures a firm's efficiency at generating profits from every unit of shareholder equity (also known as net assets or assets minus liabilities). Return On Net Worth also known as Return On Equity (ROE) shows how well a company uses investment funds to generate earnings growth. This ratio is an important yardstick of performance for equity shareholders since it indicates the return on the funds employed by them. The formula for calculation of this ratio is as follows:

ROE= Net Income After Interest And Tax/Net Worth

Where: Net Worth = Equity Capital +Reserve and Surplus

The factor which motivates shareholders to invest in a company is the expectation of an adequate rate of return on their funds and periodically they want to assess the rate of return earned in order to decide whether to continue their investment. This ratio is useful in measuring the rate of return as a percentage of the book value of shareholders equity.

3.2.1.2.1 Significance of RONW

RONW is useful for comparing the profitability of a company with that of other firms in the same industry. There are several ways for investors to use RONW:-

1. Investors want to see the return on common equity so they may modify the formula shown here by subtracting preferred dividends from net income and subtracting preferred equity from shareholders' equity, giving the following: Return on Common Equity (ROCE) = Net Income - Preferred Dividends/Common Equity.

2. Return On Equity also may be calculated by dividing net income by average shareholders' equity. Average shareholders' equity is calculated by adding shareholders' equity at the beginning of a period to shareholders' equity at the end of the period and dividing the result by 2.

3. Investors also can calculate the change in ROE for a period by using the shareholders' equity figure from the beginning of a period as a denominator to calculate the beginning ROE. Then the end-of-period shareholders equity can be used as the denominator to calculate the ending ROE. Calculating both helps investors determine the change in profitability over the period.

3.2.1.2.2 Limitations of RONW

The Return On Equity contains theoretical flaws associated with all accounting ratios that accounting returns do not measure true economic returns. In addition, the return on equity is affected by capital structure decisions of a company that change the risk to equity investors but have nothing to do with the underlying profit of real assets. For example, the Return On Equity may be increased from an increase in debt leverage even though nothing has changed in the way the company operates. However, increases in returns that come from greater leverage mean that the risk has increased. Finally, the Return On Equity is a historic measure that does not enable the drawing of conclusions with respect to future market developments. The degree to which RONW or ROE overstates the underlying economic value depends on several factors:

1. *Depreciation*: Depreciation rates faster than straight-line basis will result in a lower net income and therefore also in a lower ROE.
2. *Growth rate of new investment*: Faster growing companies will have lower Return On Equity because they need more equity.
3. *Length of project life:* The longer lifespan a project has, the more likely the ROE is going to be overstated.
4. *Capitalization policy*: The smaller the fraction of total investment is capitalized in the books, the greater will be the overstatement of ROE.
5. *Lag between investment outlays and their recoupment:* The longer it takes to recoup profits, the greater the degree of overstatement.

Another problem with measuring the Return On Equity is that the denominator of the equation is affected by write-offs. For example, if a company incurs a large loss from writing down assets, its equity balance may become very low. The low equity balance means that future returns on equity will be higher than they would be without the write-off. The write-off reduces the return in the write-off period and increases returns in subsequent periods. Similarly, the return on equity can be difficult to interpret after a company experiences losses and has a small amount of equity.

3.2.1.3 Earnings Per Share (EPS)

EPS is the net profit or loss accruing to equity-holders per outstanding share. It is a popular measure of the performance of a company and a factor in the valuation of its shares. Both the components that enter into the calculation of EPS- earnings and the number of outstanding shares- require careful definition.

'Earnings' for this purpose is the amount over which equity-holders have a claim. Therefore, it is calculated by deducting preference dividends and taxes attributable to them from the net profit and loss (including extraordinary items) for the reporting period. As for the *number of shares*, it may happen that the number of shares outstanding changes through buy-backs or issues during the period for which earnings is reported.

In that case, EPS is calculated by taking a weighted average of the shares outstanding, with the weight for each share being the proportion of the reporting period for which it has been outstanding. Bonus issues, stock-splits and reverse stock-splits (consolidation of shares) change the number of outstanding shares without changing the resources available to the firm. Therefore, companies adjust the number of equity shares outstanding for those periods for bonus issues, stock-splits and reverse stock-splits while calculating the EPS.

An earnings measure calculated by subtracting the dividends paid to holders of preferred stock from the net income for a period and dividing that result by the average number of common shares outstanding during that period. EPS is the amount of reported income, on a per-share basis, that a firm has available to pay dividends to common stockholders or to reinvest in it.

3.2.1.3.1 Significance of EPS

EPS is one of the most important ratios which measures the net profit earned per share. EPS is one of the major factors affecting the dividend policy of the firm and the market prices of the company. Growth in EPS is more relevant for pricing of shares from absolute EPS. A steady growth in EPS year after year indicates a good track of profitability. EPS is a good measure of profitability and when compared with EPS of similar companies, it gives a view of the comparative earnings or earnings power of the firm. EPS ratio calculated for a number of years indicates whether or not the earning power of the company has increased. It measures performance from the perspective of investors and potential investors. Additionally, it shows the amount of earnings available to each ordinary shareholder, so that it indicates the potential return on individual investments. These results can be achieved by comparing the EPS of either different entities or the same entity in different accounting periods, or even better, using both. Sometimes, the trend in EPS may be more accurate performance indicator than the trend in profit, though it is based on profit on ordinary activities after taxation.

3.2.2 Shortcoming of Traditional Corporate Performance Measures

Evaluating a company's performance using traditional measures derived directly from financial statements such as, Operating Profits, Earning Per Shares and Return On Equity. Return is often criticized as inadequate measurement of company's or division's performance. Although accounting principles are updated regularly to provide for the best representation of companies' operating performance and financial position, there are concerns about whether financial statement information is really useful in financial analysis and valuation because as one can apply a set of General Accepted Accounting Principles (GAAP) to companies in variety of businesses, that financial information can be managed through a judicious use of accounting principles. On the other hand, if one look at stock price as a measure of performance, it is simply substituted by one set of concern for another. Evaluating a company's performance is much more challenging than looking at stock prices. If stock prices rises or declines in a given period, it does not necessarily mean that the company is doing well or bad. This is primarily because stock price is influenced by various other factors including economic conditions prevailing in the market.

Martin and Petty (2000) identified following two major weaknesses of traditional performance measures:

1. They exclude the opportunity cost of capital invested in the firm. Only the cost of debt capital is included in their calculation while cost of shareholders' equity is ignored.
2. The measures are calculated by considering historical values. There is no guarantee that these values provide an accurate indication of the expected future performance of the firm.

Pandey (2005) identified following problems associated with accounting measures like earnings and return on investment.

1. They are based on arbitrary assumptions and policies and have scope for easy manipulability. Profits can be affected by changing description methods, inventory valuation methods or allocating costs as revenue or capital expenditures without any change in true profitability.

2. They could motivate managers to take short-term decisions at the cost of long-term profitability of the company. Managers could reduce R&D expenditure or expenditure of building the staff capability to bolster short-term profitability. This would happen more in those companies where the compensations of mangers are based on short-term earnings.
3. They do not reflect true profitability of the firm. Earnings are not Cash Flows. No distinction is made for the timing of earnings. Thus, earning measures ignore time value of money and risk.
4. The most serious problem with accounting measures is that they might destroy shareholders' wealth. A manager can increase earnings by undertaking investment projects that have positive returns but negative net present value. In other words, these projects earn returns less than the cost of capital. They would increase earnings but destroy shareholders' wealth. Shareholders are not interested in growth in earnings rather than they would like their wealth to increase through positive Net Present Value(NPV) projects

Apart from the ones given above, numerous other criticisms against the use of the traditional financial performance measures have been reported. One of the major criticisms levied against the use of these measures is that they are based on accounting data (Ehrbar, 1998; Peterson & Peterson, 1996). These accounting figures may not be an accurate indication of the actual financial situation of a firm. For example, the accounting values of property, plant and equipment may be distorted as a result of inflation and may not represent their current replacement value.

The valuation and inclusion of intangible assets (including items like goodwill, patent rights and licenses) in financial statements also present a problem when evaluating a firm. When calculating and interpreting financial measures, it is consequently of great importance that the possible influence of different accounting methods should be considered. Accounting figures are also possible to manipulate in such a way that they provide a false indication of a firm's actual financial position (Young and O'Byrne, 2001; Obrycki & Resendes, 2000; Stern *et al.*, 1995). Peterson and Peterson (1996) also criticize the application of historical accounting data to explain current and future share prices. Calculating a financial performance measures based on this questionable value could provide the analyst with an inaccurate impression of the firm's performance.

Martin & Petty (2000) while pointing the limitations of traditional measures stated that when valuing a firm the discounted value of all its expected future cash flow is normally considered. Accounting earnings, however, does not represent the expected future cash flow generated by a firm. Instead, it considers the historical earnings generated by the firm. As a result, the maximization of a firm's EPS does not necessarily result in maximization of its share value. The other problem identified by them states that they are not only cash flow values, but also the fact that they do not incorporate the risk of a firm's activities; they do not focus on the time value of money; and that the value of a measure may differ from firm to firm due to different accounting practices used by the firms.

3.3 VALUE BASED MEASURES

3.3.1 Development of Value Based Performance Measures

Due to rising need for better methods of evaluating performance, several consulting have advocated performance evaluation methods that are applied to evaluate a firm's performance as a whole. These methods, in some cases replace traditional methods of measuring performance, such as Return On Assets or Return On Equity. As a class, these measures are often referred to as value-based metrics or Economic Value Added measures.

The value based metrics are based on the idea that a company only investment in projects that enhance the firm value. In other words, the projects where return exceed cost of capital. From the perspective of analysts, the focus of performance evaluation is on the company as a whole, not on individual investment decisions within the firm[1]. The key to evaluating a firm's performance is therefore whether the firm's investment decisions, as a whole, are producing value for shareholders. But there is no obvious technique to achieve this because (1) the inability to perfectly forecast future cash flows from investments (2) there is no accurate measures of risks of each investment, and (3) no precise idea about cost of capital. Therefore, we are left with using proxies (however imperfect) to assess a firm's performance.

Over the past two decades, value based financial performance measures have experienced a large increase in popularity. Obrycki and Resendes (2000) identified following two factors responsible for increase in the popularity of value based financial measures:

1. Capital providers require an adequate Return On Investment: The management of a firm is therefore forced to consider the capital invested in the firm under its control very carefully. Since the traditional measures do not incorporate the cost of capital in its calculations, other alternative measures had to be identified.

2. The link between accounting figures and market values are not clear. Accounting figures in an attempt to explain market values provides poor or sometime misleading results. It is also difficult to compare accounting figures between different firms.

Obrycki and Resendes (2000) further identified following objectives of value based performance measures:

1. To remove the effects of accounting distortions[2] when calculating financial performance measures
2. It helps to evaluate the corporate performance of a firm as well as the performance of management
3. To be used in valuation of the firm.

3.3.2 Benefits of Value Based Measures

The major benefit of the value based performance measures over the traditional measures is that they attempt to calculate the economic profit, rather than accounting profit of a firm (Peterson and Peterson, 1996). To achieve this, value based measures incorporate an element that compensates the shareholders for the capital they provide to the firm. While accounting profits are calculated as the difference between income and expenses matched according to Generally Accepted Accounting Principles (GAAP) guidelines, the economic profits consider the difference between the operating profit and the cost of the capital employed in generating those profits. Accounting profits thus may be overstated as they exclude cost of capital.

Another benefit of value based measures is that by including accounting adjustments in their calculations, these measures attempt to remove the effect of accounting distortions from the financial statement data (Young & O' Byrne, 2001). The detail about these accounting adjustments is presented in the later part of the chapter.

A large number of different value based performance measures have been developed. This includes EVA, MVA, CFROI, NPV, IRR etc. The most prominent of recently developed techniques to evaluate a firm's performance is the value added measures of Economic Value Added (EVA) and Market Value Added (MVA), both of them developed by Stern Stewart & Company[3]. In the present study only EVA and MVA are considered as measure for performance analysis and corporate valuation.

3.3.3 Concept of Economic Profit

The concept of Economic Profit was established long ago. Consider the writing of Alferd Marshal (1890) over 100 years ago - "*When a man is engaged in the business, his profits for the year are the excess of his receipts from his business during the year over his outlay for his business. The difference between the value of the stock of plant, material etc. at the end and at the beginning of the year is taken as the part of his receipts or as part of his outlay, according as there has been an increase or decrease of value. What remains of his profits after deducting interest on his capital at the current rate.... is generally called his earnings of undertaking or management.*"[4]

Thus, one can say that a business organization has added value if it has generated a profit in excess to its overall Cost of Capital. This profit is typically referred to as the Economic Profit, a concept developed by economists like Alferd Marshal in the nineteenth century. However, after Marshal's conception about Economic Profit, some of the later accounting practitioners ignored the cost paid for the capital raised, while calculating the profitability. Rather, they were of the view that the performance and profitability of the concern can simply be measured by calculating ROI (Return On Investment) or EPS (Earnings Per Share) or any other profitability ratio. 'Return On Investment' (ROI) which was thought of as the best performance measure, as discussed in the earlier part of the chapter is the ratio which we arrive at by dividing 'Earnings After Tax' (EAT) by the capital Employed. However, this ratio is not adequate to look at the rate of return which one gets on a particular amount of investment. Accordingly, it was realized that something in addition to ROI should be taken into account while measuring the profitability of a business concern. So, EVA was developed as a response to measure the performance of company based on Economic Profit. Economic Value Added is simply another name for a company's Economic Profit. Key elements of estimating economic profits are:

- the calculation of the firm's operating profit from financial statement data, making adjustments to accounting profit to better reflect a firm's results for a period
- the calculation of the company's cost of capital
- the comparison of operating profit with the cost of capital.

The estimation of Economic Profit is analogous to the Net Present Value method of evaluating investments. The Net Present Value method, as applied in the context of evaluating performance of companies and management, was brought to the prominence by G. Bennett Stewart III, in his book entitled *A Quest for Value*. The profit that is considered for calculation of Economic Value Added is not accounting profit, but rather Economic Profit.

There are two important distinctions between accounting profit and economic profit. The first distinction deals with the cost of capital. Accounting profit is the difference between revenues and cost, based on the representation of these items according to accounting principles. Economic Profit is also the difference between revenues and costs, but, unlike the determination of accounting profits, the cost of capital is included in the costs. The second difference is the principles of recognition of revenues and cost. Accounting profits, for the most part, are represented using accrual methods, whereas economic profits reflect cash-basis accounting. However, since the only data reported in financial statements is in terms of accrual accounting, certain adjustments are made to convert accrual accounting basis data into cash basis.

3.3.4 Concept of Economic Value Added (EVA)

EVA was developed by Stern-Stewart & Co. which defines it as a financial performance measure that comes closer than any other to capturing the true economic profit of an enterprise. EVA is also the performance measure most directly linked to the creation of shareholder wealth over time. Put simply, EVA is a Net Operating Profit minus an appropriate charge for the opportunity cost of all capital invested in an enterprise. As such, EVA is an estimate of true '*Economic*' Profit, or the amount by which earnings exceed or fall short of the required minimum rate of return that shareholder and lenders could gain by investing in other securities of comparable risk.

Unlike simple traditional budgeting, EVA focuses on ends and not means as it does not state how managers can increase company's value as long as the shareholders wealth are maximized. This allowed managers to have discretion and free range creativity, avoiding any potential dysfunctional short-term behavior. Rewards such as bonuses from the attainment of EVA target level are usually paid fully at the end of 3 years. This is because workers' performance is monitored and will only be rewarded when this target is maintained consistently and hence, leading to long-term shareholders wealth.

According to Stewart (1994) EVA is an estimate of the economic profit generated by a firm. The difference between an Economic Profit and an accounting profit is a capital charge that is levied on the capital provided to the firm. In case of accounting only cost of debt capital is included. EVA, however, considers the costs of all its forms of capital (debt, as well as equity) and compensates all its capital providers accordingly (Grant, 2003).

Stewart (1991) indicates that EVA is another form of Residual Income (RI). Both EVA and RI are determined by calculating the difference between operating profit and a capital charge. Alternatively, the difference between the return on and cost of a firm's capital is considered. Multiplying this difference by the invested capital yields the Economic Capital. The difference between EVA and RI, however, is that a number of accounting adjustments are incorporated in calculation of EVA. Stewart (1994) identified that EVA differs from accounting profits in three ways:

1. It is the residual income, calculated by subtracting the firm's cost of capital.
2. A capital charge based on risk exposure of the firm is included to compensate investors for their investment.
3. Accounting figures are adjusted to remove possible distortions caused by Generally Accepted Accounting Principles (GAAP).

3.3.4.1 EVA: Evolution and Growth

As examined by Peter F. Drucker in his 1995 *Harvard Business Review* article, *"EVA is based on something we have known for a long time. It is what we call profits, the money left to service equity, is usually not profit at all. Until a business returns a profit that is greater than its cost of capital, it operates at loss. Never mind it pays taxes as if it had a genuine profit. The organization returns less to the economy that it devours resources……until then it does not create wealth, it destroys it"*.

In fact, EVA is not a newer innovation. An accounting performance measure called residual income is defined as Operating Profit subtracted with Capital Charge. EVA is thus, one variation of Residual Income and Capital. As defined by Alfred Marshall (1980), economic profits as total net gains less the interest on invested capital at the current rate. According to Dodd and Chen (1996), the idea of Residual Income appeared first in accounting theory literature early in this century. During 1970s, the Residual Income concept did not get ample publicity and it did not finish up to be the prime performance measure of companies. However, EVA practically, the similar concept with small variation and different dame, has come to force in the recent years. One possible reason why Residual Income did never gain recognition as compared to EVA is that Economic Value Added was marketed with a concept of Market Value Added (MVA) and it did offer a significant connection to market valuations (Zimmerman, 1997). The number of companies adopting EVA is increasing rapidly in the recent years particularly in the developed countries. This includes some of the most prominent U.S corporations like Coca- Cola, Eli Lilly, Bausch & Lamb and Toy "R" U's. EVA is now considered as a contemporary tool in financial management that has been developed throughout the course of the 20th century by some distinguished economists and manager.

3.3.4.2 Calculation of EVA

Stewart (1990, p.137) defined EVA as Net Operating Profit After Tax (NOPAT) subtracted with a capital charge. Algebraically, it can be stated as follows:

EVA = Net Operating Profit After Tax (NOPAT) - Cost of Capital
= Net Operating Profit After Tax – [Capital Employed × WACC]

or, equivalently, using spread (return- cost of capital) between the rate of return and the percentage of cost of capital,

EVA = (Return On Capital – Cost of Capital) X Capital Employed

Where

EVA= Economic Value Added
NOPAT= Adjusted Net Operating Profit After Tax
Cost of Capital= Cost of Equity and Debt
Capital employed = Adjusted Amount of Capital Invested in the business
WACC= weighted average cost of equity and debt capital.
Return On Capital= Ratio of Net Operating Profit after Tax to Capital Employed

It is evident from the above formula that EVA quantifies the surplus return earned by the firm. In case the firm is able to earn NOPAT or return values in excess of its total cost of capital invested, it generates a positive value of EVA. However, if NOPAT or return is insufficient to cover the firm's total cost of capital, a negative value of EVA is calculated or firm destroys value for its shareholders.

The rationale behind the calculation of EVA is that shareholder value can only be created in those cases where a firm can reward all relevant parties (shareholders and debt providers) for the capital they provided. This means that sufficient profits need to be available to cover the costs of capital and that surplus profit (if any) are available to increase the shareholder value. If a firm is not able to cover the costs of capital no surplus profits would be available to increase shareholder value (Erasmus, 2008).

3.3.4.2.1 Steps in calculation of EVA

EVA computation requires some basic steps. The following are common steps involved in calculation of EVA that may be modified due to the typical nature of business or processes where it has been used (Shil, 2009)

Step 1: Review the company's financial data

EVA is based on the financial data. Most of these data are available from the general-purpose financial statement consisting of at least income statement and balance sheet. Sometimes additional data from the notes to financial statements may also be required. In most of the cases, the last two years information prove sufficient to get all the required information to calculate EVA for any specific year. Income statement is used to calculate Net Operating Profit After Tax (NOPAT) and balance sheet is used to identify the capital invested in the business.

Step 2: Identify the necessary adjustments require to be considered

The conventional GAAP income statement and balance sheet are required to be adjusted to find out Net Operating Profit and the true capital. Companies cannot replace GAAP earnings with EVA in their public reporting, of course. The first departure from GAAP accounting is to recognize the full cost of capital. EVA also fixes the problems with GAAP by converting accounting earnings to economic earnings and accounting book value to economic book value, or capital. The result is a NOPAT figure that gives a much truer picture of the economics of the business and a capital figure that is far better measure of the funds contributed by shareholders and lenders. Stern Stewart identified around 164 potential adjustments to GAAP and to internal accounting treatments, all of which can improve the measure of Operating Profits and Capital. Now the question comes, to what extent it can be adjusted. Figure 3.1 explains the various variants of EVA.

Figure 3.1 The EVA Spectrum

(Source: Fabozzi and Grant, 2000)

The '**Basic**' EVA is the unadjusted EVA quoted from the GAAP operating profits and balance sheet. '**Disclosed**' EVA is used by Stern Stewart in its published MVA/EVA ranking and computed after a dozen standard adjustments to publicly available accounting data. '**True**' EVA, at the extreme right is the accurate EVA after considering all relevant adjustments to accounting data and using the precise cost of capital for each business unit in a corporation. '**Tailored**' EVA is what each company develop their EVA definition, peculiar to its organizational structure, business mix, strategy and accounting policies, i.e., one that optimally balances the trade-off between the simplicity and precision.

Once the formula is set, it should be virtually immutable, serving as a sort of constitutional definition of performance. According to John Shiely, The CEO of Briggs and Stratton Corp, "Adopting EVA simply as a performance measurement metric, in the absence of some ideas as to how you are going to create value, is not going to get you anywhere

(Kroll, 1997). Some adjustments that are necessary to avoid mixing operating and financial decisions, others provide a long-term perspective, and some are needed to convert GAAP accrual items to a cash-flow basis while others convert cash flow items to additions to capital. The following are some of the major adjustments necessary to put NOPAT and capital on an economic basis. These are discussed in the detail in the later part of the chapter.

- Research and development
- Strategic investments
- Accounting for Intangible - Goodwill
- Expense recognition
- Depreciation
- Restructuring charges
- Taxes
- Balance sheet adjustments

Step 3: Identify the company's capital structure

Because of the deficiency of GAAP in describing a company's real financial position (Clinton and Chen, 1998), Stewart proposes up to 164 adjustments to regain the real picture of a firm's financial performance (Stewart, 1991; Blair, 1997). These adjustments are needed to eliminate financing distortions in a company's NOPAT and capital (Stewart, 1991). Regarding adjustments, some accounting items such as costs for research and product development, restructuring charges, and marketing outlays are considered more as capital investments as opposed to expenses (Stewart, 1991). Table 3.1-A/B and 3.2A/B presents a list of such adjustments where both bottom-up and top-down approaches are used to compute the NOPAT and asset approach and source of financing approach are employed to calculate capital employed.

Table 3.1-A Calculation of NOPAT from financial statements data

A. <u>Bottom-up approach</u>
Begin:
Operating profit after depreciation and amortization
Add:
Implied interest expense on operating leases
Increase in LIFO reserve
Goodwill amortization
Increase in bad-debt reserve
Increase in net capitalized research and development
Equals:
Adjusted operating profit before taxes
Subtract:
Cash operating taxes
Equals:
NOPAT

Source: Stewart (1991)

Table 3.1-B Calculation of NOPAT from financial statements data

B. Top-down approach
Begin:
  Sales
Add:
  Increase in LIFO reserve
  Implied interest expense on operating leases
  Other income
Subtract:
  Cost of goods sold
  Selling, general, and administrative expenses
  Depreciation
Equals:
  Adjusted operating profit before taxes
Subtract:
  Cash operating taxes
Equals:
  NOPAT

Source: Stewart (1991)

Table 3.2-A Calculation of capital using accounting financial statements

A. Asset approach
Begin:
  Net (short term) operating assets
Add:
  LIFO reserve
  Net plant and equipment
  Other assets
  Goodwill
  Accumulated goodwill amortization
  Present value of operating leases
  Bad-debt reserve
  Capitalized research and development
  Cumulative write-offs of special items
  Equals:
  CAPITAL

Table 3.2-B Calculation of capital using accounting financial statements

B. Source of financing approach
Begin:
  Book value of common equity
Add equity equivalents:
  Preferred stock
  Minority interest
  Deferred income tax reserve
  LIFO reserve
  Accumulated goodwill amortization
Add debt and debt equivalents:
  Interest –bearing short-term debt
  Long-term debt
  Capitalized lease obligations
  Present value of noncapital zed leases
Equals:
  CAPITAL

Source: Stewart (1991)

Step 4: Determine the company's Cost of Capital (COC) rate for the individual sources of capital in capital structure

Estimation of cost of capital is a great challenge so far as EVA calculation for a company is concerned. The cost of capital depends primarily on the use of the funds, not the source (Ross *et al.*, 2003). It depends on so many other factors like financial structures, business risks, current interest level, investors expectation, macro-economic variables, volatility of incomes and so on. It is the minimum acceptable rate of return on new investment made by the firm from the viewpoint of creditors and investors in the firms' securities (Schall & Haley, 1980). Some financial management tools are available in this case to calculate the cost of capital. A more common and simple method is WACC (Copeland *et al.*, 1996). For calculating WACC, we have to know a lot of other issues like

1. Components of capital employed like equity, debt etc.
2. Respective weight of various components into total amount of capital employed
3. Factors that affect the risk and return of various components in a capital structure
4. Standalone cost of all such components in a capital structure

The Overall Cost of Capital (WACC) is the weighted average of the costs of the various components of the capital structure. The cost of each component of the firm's capital- debt, preferred stock, or common stock equity- is the return that investors must forgo if they are to invest in the firm's securities (Kolb & DeMong, 1988). The Capital Asset Pricing Model (CAPM) is a common method in estimating the cost of equity (Copeland *et al.*, 1996).

$$\mathbf{K_E = R_f + \beta\ (R_M - R_F)}$$

Where,

K_E = Cost of equity capital
R_f = Risk-free return
β = Systematic risk
R_M = Market return

Thus, CAPM postulates that the cost of equity (K_E) is equal to the return on risk-free security (R_f) plus a company's systematic risk, called beta (β), multiplied by the market risk premium ($R_M - R_f$) (Copeland *et al.*, 1996). Risk premium is associated with the specific risks of a given investment (Block & Hirt, 2002). The cost of debt is used as post tax cost of debt and it is easy to compute from the data available in the income statement and balance sheet.

Step 5: Calculate the company's Net Operating Profit After Tax (NOPAT)

NOPAT is derived from NOP(Net Operating Profit) simply by deducting calculated taxes from NOP , i.e., NOPAT = NOP × (1 - Tax rate). These calculated taxes do not correspond to the taxes actually paid because e.g. interest on debt decreases real taxes. The tax shield of debt is however taken into account with the capital costs. NOPAT is a measure of a company's cash generation capability from recurring business activities, while disregarding its capital structure (Dierks and Patel, 1997).

Most of the needed adjustments, to convert the accounting profit to economic profit as identified in step 2, are used and in order to remove this accounting distortion. Thus, here NOPAT can be calculated as follows:

NOPAT = Net Profit After Tax + Total Adjustments – Tax savings on adjustments

Step 6: Calculation of Economic Value Added

Finally, the EVA can be calculated by subtracting capital charges from NOPAT, as calculated in step 5 as follows (Stewart, 1991; Reimann, 1988)

EVA = NOPAT - Capital Employed X WACC

If the EVA is positive, the company created value for its owner. If the EVA is negative, owner's wealth gets reduced.

3.3.4.2.2 Accounting Adjustments for Computation of EVA

The calculation of EVA for any company consists of two separate but related steps. The primary adjustment is where a capital charge is subtracted from Net Operating Profit After Tax (NOPAT) as discussed above. The second and more controversial step consists of a series of adjustments to GAAP-based numbers. Stern Stewart, for example, has identified more than 160 potential adjustments to GAAP and to internal accounting treatments, all of which can improve the measure of operating profits and capital (Ehrbar, 1998).

Consisting of some 120 to 150 possible adjustments, these changes are made on the basis of both empirical and theoretical concerns. *First*, it is argued that adjustments to accounting numbers are required in order "...to achieve higher correlations between the short term measure (in this case EVA), and share prices, which in turn can lead to more congruent goals for divisional managers and shareholders as well as a more reliable indicator of corporate performance for security analysts and portfolio managers (Young, 1999, p. 8). *Second*, at its root is the argument that not only are accounting earnings an inappropriate proxy for value creation, but that managers who are evaluated and compensated on the basis of earnings "...may take actions that increase earnings but destroy value, or fail to take actions that may reduce earnings but create value" (Young, 1999). Young (1999, p. 8) summarizes the process as follows:

These adjustments aim to 1) produce an EVA figure that is closer to cash flows, and therefore less subject to the distortions of accrual accounting; 2) remove the arbitrary distinction between investments in tangible assets, which are capitalized, and intangible assets, which tend to be written off as incurred; 3) prevent the amortization, or write-off, of goodwill; 4) eliminate the use of successful efforts accounting; 5) bring off-balance sheet debt into the balance sheets; and 6) correct biases caused by accounting depreciation.

In most cases, however, not all of these (150-160) adjustments are relevant and only a small number will be performed. For an average firm about 25 adjustments are normally considered, while as few as five to ten are usually implemented (Stewart, 1994 ; Stern *et al.*, 1995). Nevertheless, Young (1999) argues that many of these adjustments are of little importance at the company level, and some may be difficult, if not impossible, to replicate at the security analyst level. Further, in the corporate environment the adjustments may be costly and not easily understood. The inclusion of a large number of accounting adjustments during the calculation of EVA increases the complexity of the measures (Young, 1999). The general rules for deciding on what adjustments to make to a company's net income include:

1. the materiality of the adjustments
2. the effect they will have on management's behavior
3. how easily they are understood and
4. the degree to which they will impact the company's market value

Some of the major accounting adjustments to convert accounting profits into Economic Profit and Economic Capital as suggested by Stern Stewart are as follows:

1. Research & Development

According to GAAP guidelines Research and Development (R&D) costs should be subtracted in the income statement as an expense in the period where they were incurred. This treatment of R&D severely penalizes firms with a strong emphasis on research. Deducting (relatively large) amounts of R&D expenses have a negative effect on profitability, and if left unadjusted, it will reduce EVA. This could result in manager reducing their R&D expenses during difficult years, at the disadvantage of firm (and its shareholders) over the long-term

As suggested by Stern Stewart, these R&D expenses should be capitalized and amortized over an appropriate period of time. The full capitalized amount is included in the balance sheet as an asset (which is expected to generate future returns), while an annual charge, calculated over the amortization period and is subtracted in the profit & loss account. This adjustment has a number of advantages. Managers would not be penalized for incurring necessary R&D and will thus not be tempted to reduce these costs simply to increase profits. Further, amortization in future periods also ensures that management is held accountable for R&D investment made in the past. Investing in unprofitable projects will still have a negative effect on EVA since they are charged for the capital invested in it (Ehrbar, 1998).

2. Strategic Investment

It takes some time before certain capital investment start generating returns. Since management is charged for capital invested in the firm or division, these types of projects could have a negative impact on the present EVA levels. The adjustment in EVA framework is to include such charges in a suspension account until it start generating revenues. Capital charges based on the investment is not charged against EVA during this period, but added to the suspension account included in the EVA calculation (Ehrbar, 1998). Rationale of this adjustment is that it will ensure that management is not biased against projects with delayed revenues. Furthermore, it also ensures that management is still charged for the capital tied up in the projects.

3. Deferred Tax

Taxes are only charged to profits as they are paid, rather than when they arise from timing differences between taxable income and book income under GAAP. The most significant source of the latter is the accelerated treatment of depreciation for tax purposes as against book income, with the argument that timing differences will recognize more book income than tax income (a deferred tax liability). Alternatively, deferred tax assets arise when provisions are made for future costs that serve to reduce current book income. These may include provisions for warranties, restructuring and environmental cleanup. The net change of EVA is to add (or subtract) these changes in deferred tax to more accurately reflect the actual cash flows to tax authorities. In other words, the "deferred tax adjustment brings EVA closer to cash flows, and thus eliminates any influence on profits from one of the most important components of accrual accounting" (Young, 1999, p. 12).

4. Goodwill

According to GAAP, Goodwill arising from corporate acquisition is included in the balance sheet and then usually amortized over a period. As a result accounting figures are distorted by this amortization process for a number of years. The approach suggested by Stern Stewart is to include goodwill in the balance sheet and not to amortize it at all. The adjustments add back any goodwill amortization that has been subtracted in the current year's income statement to NOPAT, and previous years' amortization amounts are added back to the invested capital amount. The reasons as suggested by Ehrbar (1998) are as follows:

- Managers are focused on cash flows and not on accounting entries
- In most cases goodwill represents an investment in items with indefinite lifetime which will continue to generate revenues in future.
- Shareholders will keep management accountable for the excess paid for an acquisition in perpetuity. They should consequently be prepared to earn excess return on the invested capital.

5. Recognition of Expenses

GAAP recognize the expenses in the period which they are incurred. In some firms, however, expenses are incurred to generate future revenues. Including these expenses in the calculation of EVA is to the disadvantage of these types of firms. The adjustment suggested by Stern Stewart is to capitalize the expenses and to amortize it over a period of time.

6. Depreciation

In practice, most firms apply straight- line method to calculate depreciation. In those firms where heavily depreciated assets are still utilized to generate revenues, however, this approach presents a problem. New investments in equipment will result in a decrease in EVA and could result in a costly delay in the replacement of equipments. In order to solve this problem, Stern Stewart suggested sinking-fund depreciation method instead of straight line depreciation method.

7. Other Adjustments

Some of other adjustments suggested include restructuring charges, inventory costing and valuation, pension- fund provisions, inflation seasonality etc. (Stewart, 1994; Young and O' Byrne, 2001).

8. Balance Sheet Adjustments

All the adjustments mentioned above can have a significant impact on the measurement of capital, or economic book value. For example, Capitalizing R& D and adding back amortized goodwill and tax reserves add to the capital. There are many other adjustments that affect the balance sheet directly. Companies should remove all off- balance - sheet items, such as uncapitalized leases and securitized receivables, back onto the balance sheet. This is essential to avoid mixing operating and financing decisions.

3.3.4.2.3 Advantages of EVA

EVA is a superior measure of corporate performance and reflects all the dimensions by which management can increase value. It helps in creation of wealth on the following grounds:

1. EVA is most directly linked to the creation of shareholder's wealth over time. The term *'maximizing value'* in the EVA context, means maximizing long term yield on shareholders' investment and not just the absolute of earnings or profits.
2. The mechanism of EVA forces management to recognize its cost of equity in all its decisions from board room to the shop floor. The inclusion of this element in overall cost of capital results into the goal congruence of the managers and owners.

   An EVA financial management system removes all the inconsistencies resulting from the use of different financial measures for different corporate functions under the typical traditional financial management system as it ties all functions for instance to one single measure- the effect on shareholder value and thus provide a meaningful target to pursue for both internal and external oriented decisions.

   a) reviewing a capital budgeting process
   b) valuing an acquisition
   c) considering strategic plan alternatives
   d) assessing performance
   e) communicating
   f) rewarding management

3. EVA compensation system ties management interest with those of shareholders.
4. EVA captures the performance status of corporate system over a broader canvas *i.e.*, to arrive at true profits, cost of borrowed capital as well as cost of equity capital should be deducted from net operating profits. Further to maximize earnings is not sufficient, at the same time consumption of capital should be minimum or optimum under EVA based system.
5. EVA framework provides a clear perception of underlying economics of a business and enables managers to make better decisions.
6. A regular monitoring of EVA emphasizes on problem areas of a company and helps managers to take corrective actions.
7. It is used to assess the likely impact of competing strategies on shareholder's wealth and thus helps the management to select the one that will best serve shareholders.

8. EVA also fits well in the concept of corporate governance. EVA bonus systems do this by giving employees an ownership stake in improvements in the EVA of their divisions or operations. This causes employees to behave like owners and reduces or eliminates the outside interference in decision making.
9. EVA also helps in brand valuation. The brand equity or value created by a particular business unit for its brand could be equated with the value of wealth that the brand has generated over a period of time.

Academic researchers have argued for the following additional benefits:

- Goal congruence of managerial and shareholder goals achieved by tying compensation of managers and other employees to EVA measures (Dierks & Patel, 1997)
- Better goal congruence than ROI (Brewer *et al.*, 1999)
- Annual performance measured tied to executive compensation
- Provision of correct incentives for capital allocations (Booth, 1997)
- Long-term performance that is not compromised in favor of short-term results (Booth, 1997)
- Provision of significant information value beyond traditional accounting measures of EPS, ROA and ROE (Chen & Dodd, 1997)

3.3.4.2.4 Limitations of EVA

EVA also has its critics. Brewer *et al.*, (1999) cited the following limitations to EVA:

1. EVA does not control for size differences across plants or divisions
2. EVA is based on financial accounting methods that can be manipulated by managers
3. EVA may focus on immediate results which diminishes innovation
4. EVA provides information that is obvious but offers no solutions in much the same way as historical financial statement do

Also, Chandra (2001) identifies the following two limitations of EVA:

- Given the emphasis of EVA on improving business-unit performance, it does not encourage collaborative relationship between business unit managers
- EVA although a better measure than EPS, PAT and RONW is still not a perfect measure.

Brewer *et al.*, (1999) recommend using other performance measures along with EVA and suggest the balanced scorecard system. Other researchers have noted that EVA does not correlate as strongly with stock returns as its proponents claim. Chen & Dodd (1997) found that, while EVA provides significant information value, other accounting profit measures also provide significant information and should not be discarded in favor of EVA alone. Biddle *et al.*, (1997) found only marginal information content beyond earnings and suggest a greater association of earnings with returns and firm values than EVA, residual income, or cash flow from operations.

Finally, a key criticism of EVA is that it is simply a retreaded model of residual income and that the large number of "*equity adjustments*" incorporated in the Stern Stewart system may not be necessary (Barfield, 1998; Chen & Dodd, 1997; O'Hanlon & Peasnell, 1998; Young, 1997). The similarity between EVA and residual income is supported by Chen and Dodd (1997) who note that most of the EVA and residual income variables are highly correlated and are almost identical in terms of association to stock return.

3.3.5 Concept of Market Value Added (MVA)

A measure closely related to Economic Profit is Market Value Added (MVA). Market Value Added is the difference between the firm's market value and its capital. Essentially, market value added is a measure of what the company's management has been able to do with a given level of resources (i.e., the invested capital).

MVA = Market Value of the firm – Book Value of Capital

Where

MVA= Market Value Added
Market Value of the firm = Market Value of both debt and equity
Book Value of Capital = Book value of both debt and equity

If MVA is positive, the firm has added value. If it is negative, the firm has destroyed value for its shareholders'. MVA is a measure of shareholders wealth. If the corporate objective is to enhance shareholders wealth, it can be achieved by improving MVA. Maximizing MVA, therefore, should be the primary objective for any company that is concerned about its shareholders welfare. EVA is the internal measure of corporate performance whereas MVA is the external measure of corporate performance.

3.4 CONCLUSION

Since the early 1980s there has been a global momentum in the economy. Capital markets became more and more global in outlook. Moreover, investors started to be more sophisticated than ever and wanted to know all possible details about a company. Maximizing shareholders value has become the new corporate paradigm in recent years. The Corporates, which gave the lowest preference to shareholders curiosity, are now bestowing the utmost preference to it. Shareholders wealth is measured in terms of returns they receive on their investment. It can either be in forms of dividends or in the form of capital appreciation or both. Capital appreciation depends on the changes in the market value of the stocks. The market value of stocks depends upon number of factors ranging from company specific to market specific. Financial information is used by various stakeholders to assess firm's current performance and to forecast the future as well.

There has been a growing concern about the performance measures based on traditional accounting information such as Return On Equity (ROE), Earnings Per Share (EPS), Net Operating Profit After Tax(NOPAT) and Return On Investment (ROI) etc. These measures although widely used fails to capture the shareholders value creation/destruction as a result of management actions. These are criticized as they exclude the opportunity cost of capital invested in the firm. Only the cost of debt capital is included in their calculation while cost of shareholders' equity is ignored. Further, these measures are calculated by considering historical values. There is no guarantee that these values provide an accurate indication of the expected future performance of the firm. In order to overcome the shortcoming of conventional corporate performance measures, value based measures came into use to assess the true profitability of the corporations. The major benefit of the value based performance measures over the traditional measures is that they attempt to calculate the economic profit, rather than accounting profit of a firm. To achieve this, value based measures incorporate an element that compensates the shareholders for the capital they provide to the firm. While accounting profits are calculated as the difference between income and expenses matched according to Generally Accepted Accounting Principles (GAAP) guidelines, on the other hand economic profits consider the difference between the operating profit and the cost of the capital employed in generating those profits. Accounting profits thus may be overstated as they exclude cost of capital. Another benefit of value based measures is that by including accounting adjustments in their calculations, these measures attempt to remove the effect of accounting distortions from the financial statement data. A large number of different value based performance measures have been developed. This includes EVA, MVA, CFROI, NPV and IRR etc. The most prominent of recently developed techniques to evaluate a firm's performance is the value- added measures of Economic Value Added (EVA) and Market Value Added (MVA), both of them developed by Stern Stewart & Company. Economic Value Added (EVA) is a measurement tool that provides a clear picture of whether a business is creating or destroying shareholder wealth. EVA measures the firm's ability to earn more than the true cost of capital. EVA combines the concept of residual income with the idea that all capital has a cost, which means that it is a measure of the profit that remains after earning a required rate of return on capital. If a firm's earnings exceed the true cost of capital, it is creating wealth for its shareholders. The concept of EVA has gained popularity all over the world particularly in USA, UK and European countries as companies are using EVA as an internal as well as external performance measure because it is consistent with the organizational objective of shareholders value creation.

Notes

1. For detailed discussion see Chapter 4 (pp. 68-69) of Value-Based Measures: Foundations and Practice by Fabozzi and Grant (2000).
2. Wild and Subramanyam (2009) define Accounting distortions as deviations of reported information in financial statements from the underlying business reality. These distortions can arise from accounting standards, estimates inherent in the accounting process, latitudes in application, and the inability of accounting to capture, in a representational way, the economic substance of certain transactions and events.
3. Stern Stewart & Co is a global management consulting firm founded in 1982 in New York. It helps companies to operationalize value creation by focusing on business strategy, management systems, organizational design, change management and incentive systems. The company developed the Economic value added concept and currently owns the trademark. Till date, More than 700 firms around the world have implemented the EVA program as a management system for measuring performance, allocating capital to the best investment opportunities, training and developing the human capital to understand the value principle, designing incentive contracts for employees at all levels of the firm and, screening strategic plans to determine which are likely to create the most value and which need to be put aside because they do not create value at all.
4. See Marshal, Alferd, *The Principles of Economics*, 1890, Chapter 4.

CHAPTER 4
RESEARCH DESIGN

CHAPTER 4
RESEARCH DESIGN

Preview

This chapter discusses the research design based on the research questions that have been empirically examined with research hypotheses. Detailed description of the background of the research methodology has been provided linking it with the research questions. Size and composition of the sample, data source, a detailed description of the research variables to be used and empirical models to be tested in order to achieve objectives of the study have also been included in this chapter.

4.1 INTRODUCTION

The main purpose of this study is to empirically test the efficacy of various corporate financial performance measures to explain the contemporary MVA of Indian companies at aggregate and disaggregate level. The research investigates whether value based measure i.e. EVA is a better reflector of firm value as compared to conventional financial performance measures in Indian market. Economic Value Added (EVA), a surrogate for abnormal profit in the economist's sense, has received a great deal of attention as another new single-period criterion for decision making and performance evaluation (e. g., Zafiris and Bayldon, 1999). Moreover, it has been repeatedly portrayed by Stem Stewart & Co and other proponents as the key to create shareholder wealth (e.g. Stewart, 1991; Tully, 1993; Ehrbar 1999; Grant 2003). Hence, it is important to empirically investigate to what extent EVA can explain MVA so that an answer can be reached at as to whether it is a reliable guide to accomplish the goal to maximize shareholder wealth. Alongwith EVA, seven commonly used conventional performance measures, namely ROE, ROI, NOPAT, EPS, OCF, NI and RI have also been investigated in order to highlight the value-relevance of EVA vis-a-vis these measures.

The remainder of the chapter is organized as follows. Next section presents the empirical questions concerning the link between shareholder value and various performance metrics, including EVA. Section 3 develops and identifies the main hypothesis of the study and the associated arguments about the link between EVA and market value, Section 4 elaborate the sample section methodology and data sources. Section 5 deals with research variables and their computation methodology. Last section deals with statistical technique to be used in order to test the research hypotheses.

4.2 RESEARCH QUESTIONS

This study is primarily intended to examine whether EVA outperforms conventional performance of Indian market in explaining the contemporaneous MVA. It further aims to test which among the both- value based measurement i.e. EVA ***or*** conventional accounting based corporate performance measures such as ROE, ROI, EPS, NOPAT etc. is better predictor of Market Value Added (MVA) of Indian companies both at aggregate and industry level. In order to achieve this following research questions are empirically examined and analyzed:-

1. Does a statistical relationship between EVA and shareholder wealth exist, and if it does, how much of the variation of the shareholder value (as measured by MVA) of Indian companies can be explained by EVA?
2. Does EVA dominate traditional performance measures such as ROCE, RONW, EPS, NOPAT, NI, OCF and RI in explaining contemporaneous MVA of Indian companies?
3. Do components unique to EVA helps in explaining contemporaneous MVA beyond the explanation given by other components?
4. Does EVA or traditional performance measures such as ROCE, RONW, EPS, NOPAT, NI, OCF and RI dominate in explaining contemporaneous MVA among different Indian industries?

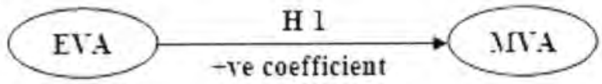
4.3 HYPOTHESES

In order to achieve the objectives of the study and based on the literature review and conceptual model of the study, following hypotheses are framed and supported by literature.

H1: Economic Value Added (EVA) is significantly and positively associated with the firm's Market Value Added.

This hypothesis directly addresses the first research question and predicts whether there is a significant relationship between Economic Value Added (EVA) and change in the shareholders wealth as measured by Market Value Added of the Indian companies. The coefficient of EVA is viewed as the weight that stock market attaches (which is reflected in stock return or MVA) to this value added measures. A positive sign of coefficient indicates that EVA is associated with dependent variable i.e. MVA. Consistent with earlier empirical studies (see Chen and Dodd, 1997; Kramer and Pushner, 1997; Lehn and Makhija 1997; Elali, 2006, Ismail, 2006, Kim, 2006; Stewart, 1991; Palliam, 2006; and Maditinos *et al.*, 2009), the present study hypothesizes that EVA is strongly and positively associated with MVA as it provides additional information to explain the variation in the MVA of the sample companies.

Figure 4.1 Relationships between EVA and MVA

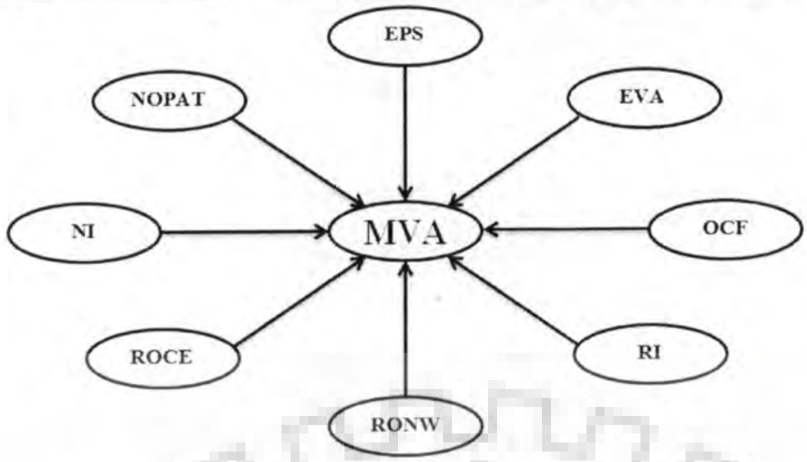


This predication is consistent with the theoretical valuation models in finance which suggest various components of Residual Income that should be associated with firm value in a manner that differs predictably in terms of both size and magnitude of the association, and that they depend on the accounting and economic environment in which a firm operate (Livant and Zorowin, 1990; Barth et al., 1999 and Elali, 2006). As hypothesized above, figure 4.1 exhibits the causal relationship between EVA and MVA.

H2: EVA dominates conventional performance measures such as NOPAT, ROCE, RONW, and EPS etc. in explaining the contemporaneous MVA.

The present study compares the value relevance of EVA and conventional performance measures such as ROCE, RONW, EPS, NOPAT, NI and OFC etc. in predicting MVA of the sample companies. It is assumed that these measures are positively and highly correlated with MVA of the sample companies and it serve as important predictor of MVA. This hypothesis is in line with earlier work by Biddle *et al.,* 1997; Chen and Dodd, 1997; Lehn and Makhija, 1997; Feltham *et al.,* 2004; Worthington & West, 2004; Elali, 2006 Ismail, 2006; and Kim, 2006. Further, it is also hypothesized that EVA would outperform conventional performance in explaining the variation in the MVA of the sample companies. Studies by Lehn and Makhija, 1997; Feltham *et al.,* 2004; Worthington & West, 2004, Urbanczyk *et al.,* 2005 and Elali, 2006 also proved that value based measures such as EVA are more highly associated with MVA and firm values than accrual earnings, Residual Income or Cash Flow From Operations. Both, Relative Information content and Incremental Information contents tests are performed to examine the superiority of EVA over conventional performance measures. Figure 4.2 exhibits the association between EVA, conventional performance measures and MVA.

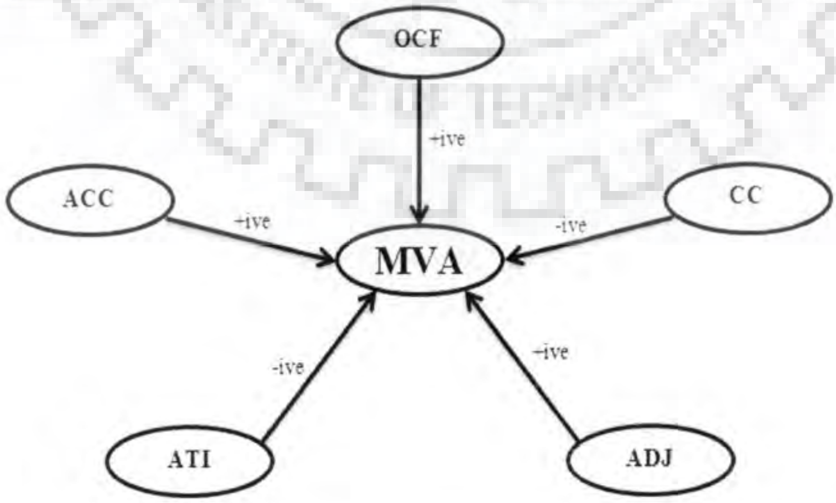
Figure 4.2 Relationship between various performance measures and MVA



H3: Components unique to EVA help in explaining contemporaneous MVA beyond the explanation given by than other measures.

Hypothesis 3 address the third research question and analyses whether components unique to EVA have value relevance over other components. Using Biddle *et al.,* 1997; Worthington and West, 2004; Ismail, 2006; Kyriazis and Anastassis, 2007; and Erasmus, 2008 methodology, this study disintegrate the component of EVA model. Further, this study predicts that components unique to EVA are expected to have more information content as compared to other components. Again similar to hypothesis 2, both Relative Information content and Incremental Information contents tests are performed to examine the superiority of EVA components over other measures. Figure 4.3 show the causal relationship between EVA components and MVA and their expected signs.

Figure 4.3 Relationships between EVA components and MVA and their expected signs



H4: EVA dominates conventional performance measures such as NOPAT, ROCE, RONW, and EPS etc. in explaining contemporaneous MVA in different industries.

In hypothesis 2, the value relevance of EVA and conventional performance measures such as ROCE, RONW, EPS, NOPAT, NI and OFC etc. in predicting MVA of the sample companies is analyzed using aggregate level. In hypothesis 4, value relevance of EVA and conventional performance measures such as ROCE, RONW, EPS, NOPAT, NI and OFC etc. in predicting MVA of the sample companies is analyzed at disaggregate (industry) level. The main objective of this hypothesis to analyze and compare the value relevance of EVA and traditional performance measures in different industries and examine the difference. Similar to hypothesis 2, this hypothesis is in line with earlier work by Biddle *et al.*, 1997; Chen and Dodd, 1997; Lehn and Makhija, 1997; Feltham *et al.*, 2004; Worthington & West, 2004; Elali, 2006; Ismail, 2006; and Kim, 2006. Further, it is also hypothesized that EVA would outperform conventional performance in explaining the variation in the MVA of the sample industries. Relative Information content test will be applied to rank the various measures in different industries and to examine the superiority of EVA over conventional performance measures in sample industries.

4.4 SAMPLE SIZE

The hypotheses have been tested on the time series data of maximum possible numbers of Indian companies starting from financial year 1999-2000 till financial year 2008-09. The sample was extracted from the companies listed on Bombay Stock Exchange (BSE). The rationale for choosing this stock exchange for the purpose of current study was to gather maximum possible number of companies. In case, any other stock exchange was selected, neither the number of companies available was as high as BSE, nor the full information about variables used in the study was available to conduct the research over the period of 2000-2009. In order to construct the final sample, **Prowess**[1] - a renowned database from Centre For Monitoring Indian Economy (CMIE) was used. The time span of data was 1999-2000 till 2008-09 only. Final sample was constructed using followings criteria:

1. Sample firms must belong to non-financial sector as defined by Prowess database
2. Firms must be available during the study period i.e. 2000 to 2009
3. Firms must be listed on Bombay Stock Exchange during the above stated period
4. Complete information about various variables used in the study must be available for the ten years

The sample selection started with a universe of all the 4959 companies listed in BSE as on **May 3, 2010**. From this, banking & financial companies and irrigation companies were removed since present study was limited to non-financial companies[2] covering companies from manufacturing and service sector only. The industry classification was already given in the Prowess database. After removing the companies related to these two industries (financial and irrigation) from the 4959 initially identified companies a list of 4152 companies was left.

Table 4.1 Sample selection procedure

Particulars	**Total number of companies**
Total Numbers of Firms listed at BSE as on May 3,2010 and included in Prowess Data base	4959
Less: Financial, banking and irrigation companies	807
Remaining Non-financial firms	4152
Less: Firms with not listed and with missing information as on March 31, 2000	2397
Listed firms with full information on March 31, 2000	1755
Less : Firm with missing information between April 1, 2000 and March 31, 2001	10
Listed firms with full information on March 31,2001	1745
Less : Firm with missing information between April 1, 2001 and March 31, 2002	124
Listed firms with full information on March 31,2002	1621
Less : Firm with missing information between April 1, 2002 and March 31, 2003	158
Listed firms with full information on March 31,2003	1463
Less : Firm with missing information between April 1, 2003 and March 31, 2004	116
Listed firms with full information on March 31,2004	1347
Less : Firm with missing information between April 1, 2004 and March 31, 2005	28
Listed firms with full information on March 31,2005	1319
Less : Firm with missing information between April 1, 2005 and March 31, 2006	52
Listed firms with full information on March 31,2006	1267
Less : Firm with missing information between April 1, 2006 and March 31, 2007	15
Listed firms with full information on March 31,2007	1252
Less : Firm with missing information between April 1, 2007 and March 31, 2008	23
Listed firms with full information on March 31,2007	1229
Less : Firm with missing information between April 1, 2008 and March 31, 2009	16
Final Sample Companies with full information between April 1, 2000 to March 31, 2009	1213
Less: firms with extreme observations	217
Final companies Analyzed	**996**

Then, back testing was applied on the data of 4152 companies identified after removing banking, financial and irrigation companies on March 31, 2000 using their trading price (in order to ensure the availability of the companies during the study period i.e. 2000-2009) at BSE and got a list of 1755 such companies whose stock price information was available on March 31, 2000. From March 31, 2000 the same procedure was applied for all data availability consecutively till March 31, 2009 and finally a sample of 1213 nonfinancial companies with full information and fulfilling sample selection criteria was arrived. Table 4.1 presents the year wise availability of companies after reduction using sample criteria and synoptic view of sample selection procedure.

4.5 DATA SOURCE

The present study is based on secondary data. Data about various variables used in the study is mainly obtained from ***Prowess*** and ***Capitaline Plus***[3] databases. Since EVA figures are not published by Stern Stewart for Indian companies, the EVA values are calculated from the information available in the *Prowess database* using standardized financial statements. For this purpose, Net Operating Profit After Tax (NOPAT) is used as available in the database and various adjustments as suggested in BT-SS Survey[4], 2001 about Indian companies are made in the NOPAT to arrive at economic profit figures. Economic capital of the sample companies for the period 2000-2009 is also calculated after making the adjustments suggested in the BT-SS survey about Indian companies. These adjustments are discussed in detail in the variables definition section of the chapters. For the purpose of calculating cost of equity using CAPM model, data related to risk free return (R_f) was obtained from Reserve Bank of India- **Database on Indian Economy**[5] and yield on 10 years Government bond is used for this purpose for a period of 2000-2009. Further, for calculation of market return (R_m), annual returns of **BSE SENSEX**[6] is used as proxy for market return and data related to return was taken from official website of Bombay Stock Exchange (BSE). For the calculation beta (β) data related to security returns (R_i) for the period 2000-2009 was taken from Prowess database. Cost of debt is calculated using the data given in the Prowess database. Data related to weights for calculation of weighted average Cost of Capital is taken from the financial information given in Prowess database. Data about ROCE, RONW, EPS, NOPAT, NI and OCF of the sample companies is directly taken from Prowess and Capitaline plus. Residual Income (RI) of the sample companies is calculated taking NOPAT figures from Prowess and Cost of Capital calculated using the procedure as defined above. Lastly, Market Value Added (MVA) of the sample companies is culled from Prowess database.

4.6 RESEARCH VARIABLES

In addition to dependent variable, Market Value Added (MVA), the present study selected seven independent variables: Economic Value Added (EVA), Return On Net worth (RONW), Return On Capital Employed (ROCE), Earnings Per Share (EPS), Net Operating Profit After Tax (NOPAT), Net Income (NI), Cash Flow From Operations (OCF) and Residual Income (RI). These variables are described as follows:

4.6.1 Dependent Variable

4.6.1.1 Market Value Added (MVA)

The dependent variable used in the present study is Market Value Added (MVA) - a commonly used variable to measure corporate performance and value creation. MVA is used as a proxy for stock returns and wealth creation by various researchers (see Eljelly and Alghurair, 2001; Lee and Kim, 2009 etc.). MVA is a concept developed by Stern Stewart & Co and may be defined as the aggregate Net Present Value (NPV) of all the firm's activities and investments. It represents the value created (or destroyed) over the lifetime of a firm and can been be seen as a proxy for the past and current value of the firm's strategies (Elali, 2006). MVA is calculated as the difference between total market value and total "economic" book value (capital). MVA was chosen because it is a measure that captures the relative success of firms in maximizing shareholder value through efficient allocation and management of scarce resource. Another reason of selection of MVA was that it is widely used by various researchers for example, Finegan, 1989; Stewart,1991; Kramer and Pushner, 1997; Banerjee, 2000; Eljelly and Alghurair, 2001; Kukreja & Giridhar, 2005; Elali, 2006; Ghanbari and Sarlak, 2006; Kim, 2006; Ghanbari and More, 2007; Ramana, 2007; Vijayakumar & Selvi, 2008; Sunitha, 2008 etc. have used MVA to measure the effectiveness of various corporate financial performance in their respective studies. Further, Erasmus (2008) and Maditions *et al.*, (2006, 2009) suggested that MVA should be used in future researches as it clearly and better reflects the surplus share returns. This also forms the rationale for using MVA in place of stock returns. One important methodology issue, though, is whether the level of MVA is influenced by the size of a firm. In order to control for a firm's size, MVA is scaled by dividing it by the total capital invested in the company at the beginning of the year as used by Elali, 2006 and Kim, 2006. Following the methodology used by BT- Stern Stewart Survey[7], MVA is calculated using following formula:

MVA = Market Value of the Firm - Economic Capital

Where

Market Value of firm	=	Market value of the share capital outstanding at the year end.
Economic Capital	=	Net Fixed Assets + Investments + Current Assets - (non-interest bearing current liabilities (NIBCLs) + Miscellaneous Expenditure

Not Written Off + Intangible Assets + Cumulative Non-Recurring Losses + Capitalised Expenditure On R&D) - Revaluation Reserve - Cumulative Non-Recurring Gains.

4.6.2 Independent Variables

The independent variables used in the study are: Economic Value Added (EVA), Return on Net worth (RONW), Return on Capital Employed (ROCE), Earnings Per Share (EPS), Net Operating Profit After Tax (NOPAT), Net Income (NI), Cash Flow From Operations (CFO) and Residual Income (RI). Further, Cash Flow From Operations (CFO), Cost of Capital (CC), After Tax Interest (ATI), Accruals (ACC), EVA Accounting Adjustments (ADJ) are also employed as independent variables for components analysis of EVA. All these measures are frequently used by various researchers in the literature on corporate financial performance measures.

4.6.2.1 Economic Value Added (EVA)

Economic Value Added (EVA) as discussed in detail in chapter 3 is one of the popular and widely used value based corporate performance measures. It is a measure of true economic profit or the amount by which earnings exceed or fall short of the required rate of return that investors can expect to earn while investing in other assets of comparable risk (Elali, 2006). EVA is defined as the difference between a firm's Net Operating Profit After Tax (NOPAT) and an appropriate charge for the opportunity cost of all capital invested in that firm (Stewart, 1991). Since EVA figures are not readily available about Indian companies, so it was computed using Stern- Stewart methodology for the purpose of the present study. In order to calculate the EVA of the sample companies, methodology used by BT- Stern Stewart survey, 2002-2004 is followed. EVA in this study calculated by using following formula:-

EVA = NOPAT – Capital charge

= NOAPT – (WACC X Economic Capital)

Where:-

a) EVA= Economic Value Added
b) NOPAT = After Tax net operating profit after adjusting various items of non- operating and non- recurring nature to arrive at economic profit for calculation of economic value.
c) WACC= Weighted average Cost of Capital. The weighted average cost of capital is calculated by calculating the cost of equity capital as well as after tax cost of debt and then multiplying the each cost by weights (proportion). The cost of equity capital is calculated by using Capital Assets Pricing Model (CAPM) by formula:- $K_e = R_f + \beta (R_m - R_f)$, where K_e is cost of equity capital, R_f is returns on risk- free investment R_m is market returns and β is sensitivity of security returns with market returns. The capital asset pricing model uses the market (R_m) as a benchmark for estimating the cost

of equity. The Model assumes that the cost of equity (K_e) is simply a "risk free rate of return"(R_f) plus a premium that investors require to take on additional market risk.

d) Economic Capital = Amount of capital invested in a business after making adjustments as suggested by Stern- Stewart & co.

Following are important adjustments that were made in profit and loss account and balance sheet of company to compute the NOPAT and the Economic Capital.

i. *Research & Development*: The after-tax R&D expenditure is included in capital and added back to NOPAT. The amount included in capital is amortized over five years.

ii. *Goodwill*: Goodwill amortization is excluded from the NOPAT, and gross goodwill is included in capital.

iii. *Interest:* All interest expenses are added back to profits. The tax-benefits of interest are also removed, and the cash operating taxes are adjusted accordingly.

iv. *Construction in Progress:* Construction in progress is included in capital.

v. *Non-Recurring Income and Expenditure:* Non-recurring items are excluded from NOPAT, and capitalised after tax. Non-recurring expenditure is taken as addition to capital and non-recurring income as reduction.

vi. *Cash-Operating Taxes:* Tax provision is restated to reflect taxes paid on operations. The tax-effects of financing and non-recurring items are eliminated.

vii. *Investments in Marketable Securities*: These are included in capital, and the income from them shown in the books of accounts is included in the NOPAT.

viii. *Revaluation Reserve:* This is excluded from capital while calculating Economic Capital.

After making the above mentioned adjustments, following formula is used to calculate different components:

NOPAT = (Profits After Tax + Non-Recurring Expenses + Revenue Expenditure On R&D + Interest Expense + Provision For Taxes) - Non-Recurring Income - R&D Amortization - Cash Operating Taxes.

Cash Operating Taxes = (Provision For Taxes + Tax Benefit of Non-Recurring Expenses + Tax Benefit of Interest Expense - Tax on Non-Recurring Income).

Economic Capital = Net Fixed Assets + Investments + Current Assets - (NIBCLs + Miscellaneous Expenditure Not Written off + Intangible Assets + Cumulative Non-Recurring Losses + Capitalised Expenditure On R&D) - Revaluation Reserve - Cumulative Non-Recurring Gains.

4.6.2.2 Earnings Per Share (EPS)

EPS is defined as (PAT−Dividend on Preferred shares)/Number of outstanding equity shares. The value of EPS has been expressed in money terms. EPS has been one of the most widely used measures of financial performance. Stern, 1993; Dodd and Chen, 1996; Uyemura *et al.*, 1996; Chen & Dodd, 1997; Anand *et al.*, 1999; Eljelly and Alghurair, 2001; De Wet, 2005; Palliam, 2006; Lin and Zhilin, 2008; and Maditinos *et al.,* 2009 etc. have used EPS as explanatory variables in their respective studies. The figure related to EPS is directly taken from Prowess database.

4.6.2.3 Net Operating Profit After Tax (NOPAT)

NOPAT is defined as the profits derived from the company's operations after tax but before financing costs and non-cash book keeping entries, except for depreciation, which is reckoned as "a *true economic expense"*. NOPAT is calculated as follow:

NOPAT = EBIT – Tax

Where;
NOPAT = Net Operating Profit After Tax
EBIT = Earnings Before Interest and Tax
Tax = Corporate Income Tax

The value of NOPAT has been expressed in absolute terms. NOPAT has been selected as an independent variable as normally it is expected to have a positive correlation with the MVA i.e. increasing NOPAT in a well functioning capital market is likely to give a boost to the share prices and vice versa. Various researcher like O'Byrne, 1996; Biddle *et al.*, 1997; Kramer and Pushner, 1997 ; Fernandez 2001; Kramer and Peters, 2001 ; Peixoto, 2001; Worthington and West, 2004; Ismail, 2006 ; Kim, 2006; Tsuji, 2006; Kyriazis and Anastassis, 2007; Vijayakumar and Selvi, 2008; have used NOPAT as one of the variable in their respective studies.

4.6.2.4 Return On Net Worth (RONW)

RONW measures the returns to providers of equity funds. It is calculated as given below

RONW = [Net Income After Tax / Shareholders Equity]

Where shareholders equity refers to the aggregate of paid up capital and reserves and surplus appearing as a part of shareholders funds. Net Income is the profit after tax and preference dividend. RONW is one of the widely used variable in the accounting literature and researchers like Millunovich and Tsuei, 1996; Uyemura *et al.,* 1996 ; Chen & Dodd, 1997; Eljelly and Alghurair, 2001; DeWet, 2005; Kukreja & Giridhar, 2005; Palliam, 2006 ; Ghanbari & More, 2007; Ramana, 2007; Lin and Zhilin, 2008 ; Vijayakumar & Selvi, 2008 ;and Maditinos *et al.,* 2009; etc. The data related to RONW of sample companies was obtained from Prowess Database.

4.6.2.5 Return On Capital Employed (ROCE)

ROCE is one of the most popular measures used by the companies for evaluating their performance. It is also reported in the annual accounts as one of the key measures of success. It is also one of the main measures of the divisional performance. ROCE is calculated as:

ROCE = [Net Income + Interest (1 - tax rate)/ Capital Employed]

Many Indian studies examining the relationship between traditional and value based measures have widely used ROI as one of the variable in their researches. Some of the studies include Thenmozhi, 1999; Pal and Garg, 2004; Kukreja & Giridhar , 2005; Ghanbari & More, 2007; Pal and Kumar, 2007; Sunitha, 2008; and Vijayakumar & Selvi, 2008 . Further many studies conducted in other markets like Lehn & Makhija, 1996; Uyemura *et al.,* 1996; Chen & Dodd, 1997; De Wet, 2005; also used ROCE as one of the variable in their respective studies.

4.6.2.6 Net Income (NI) or Profit After Tax (PAT)

Studies by Uyemura *et al*., 1996 ; Biddle *et al*., 1999; Fernandez, 2002; Jahur & Riyadh, 2002; Ismail, 2006; Tsuji, 2006; Ghanbari & More, 2007 ; Ramana, 2007; Kyriazis & Anastassis, 2007; and Sunitha, 2008 etc. have used Net Income as one of the variable to study the relationship between various corporate performance measures. Net Income reflects the profit distributing ability of the business. It is net income available for shareholders. Net Income is reported in Income statement as Profit after Tax (PAT) and data about NI is taken from the CMIE- Prowess database.

4.6.2.7 Cash Flow From Operations (OCF)

Cash Flow From Operations is used because accrual based accounting indicators such as RONW, PAT and NOPAT are susceptible to different accounting assumptions. There are several financial items where there is a possibility of different accounting assumptions. Depreciation, amortization, and inventory valuation are some of the common accounting issues the treatment of which depends on the accounting assumptions. Therefore managers and business analyst use the cash flow based measures. OCF is not be affected by the change in accounting assumptions. Cash flow from operations the cash that a company generates through running its business or from operating activities. OCF in the present study is calculated as:

OCF=NOPAT+ depreciation and amortization±change in net operating working capital

Where
OCF = Cash Flow From Operations
NOPAT = Net Operating Profit After Tax

Research on efficiency of corporate financial performance measures have extensively used OCF as important variable [*See* Millunovich and Tsuei, 1996 ; O' Byrne, 1996; Biddle *et al.*, 1997; Worthington and West, 2001& 2004 ; Eljelly and Alghurair , 2001;Ramana, 2004 &2007; DeWet, 2005; Kukreja & Giridhar, 2005; Ismail, 2006 ; Kim, 2006 ; Tsuji, 2006; Erasmus , 2008; Sunitha, 2008 ; Lee and Kim, 2009]

4.6.2.8 Residual Income (RI)

Residual Income is defined as the difference between firm's operating profit, generally, the Operating Profit After Tax (NOPAT) less a capital charge (Biddle *et al.*, 1997). The capital charge is defined as The Weighted Average Cost of Capital (WACC). The WACC incorporates the cost of equity and cost of debt capital. The major difference between EVA and Residual Income (RI) is the accounting adjustments included in the calculation of EVA. RI considers only the accounting figures and no emphasis is given to remove the possible distorting effect of GAAP accounting. Residual Income was applied by General Motors in early 1920's and by1950's started using RI as measure of divisional performance and executive compensation. Further, Egginton , 1995; Dodd and Chen, 1996 ; Biddle *et al.*, 1997;Chen and Dodd, 2001; Worthington & West, 2004 ; Ismail, 2006 ; Kyriazis & Anastassis , 2007 ; and Erasmus , 2008 examined the efficiency of RI as a performance measures in their respective studies. RI is used as independent variable in the present study and calculated as

RI= NOPAT- Cost of Capital × Total Capital

Where
RI= Residual Income
NOPAT= Net Operating Profit After Tax
Total Capital = Total Capital Employed
Cost of Capital = Weighted Average Cost of Debt and Equity Capital.

One important point to mention here is that both NOPAT and Total capital are used as reported in the financial statements without any accounting adjustment made.

Table 4.2 Variables and its types

Variable	Symbol	Types
Market Value Added	MVA	Dependent
Earnings Per Share (EPS)	EPS	Independent
Return On Capital Employed	ROCE	Independent
Return On Net Worth	RONW	Independent
Net Operating Profit After Tax	NOPAT	Independent
Net Income	NI	Independent
Operating Cash Flow	OCF	Independent
Residual Income	RI	Independent
Economic Value Added	EVA	Independent
Accruals	ACC	Independent
After Tax Interest	ATI	Independent
Cost of Capital	CC	Independent
EVA Accounting Adjustment	ADJ	Independent

4.7 RESEARCH TECHNIQUE

In this study panel data (sometimes referred to as pooled data) regression is used to test the research hypotheses. In the last decade or so, panel data analysis has become central in quantitative studies. Its popularity has been greatly increased among social and behavioural science research and it became one of the most active and innovative bodies of literature in econometrics. The main limitation of basic regression is that it is based on the assumption that parameters do not vary across sample observations. Whereas, pooled time series model (panel) allows parameters to vary in some systematic and /or random way across partitions of the sample data or even from observation to observation (Ismail, 2006). In the present study, to test the relative and incremental information content of various performance measures, various univariate and multivariate econometric models would be built and analyzed. A description of panel data technique is given in the following section.

4.7.1 Panel Data

A panel dataset contains observations on multiple entities (individuals), where each entity is observed at two or more points in time. Baltagi (2005) defines the term "panel data" to the pooling of observations on a cross section of individuals, such as households, countries and firms, over several time periods. Thus it provides multiple observations on each individual in the sample. Panel data is a special case of multilevel data and can have a more complicated clustering or hierarchical structure (Hsiao, 2007; Luke, 2004). The number of studies on panel data has increased tremendously during recent years due to many useful properties of these data sets (Hsiao, 2006). Panel data sets are currently widely used especially in social sciences and econometric analysis due to several major advantages over conventional cross sectional or single time series data sets (Hsiao, 2003).

4.7.1.1 Advantages of Panel Data

Baltagi (2005) summarizes the benefits and limitation of using panel data. The benefits include the following:

Controlling for individual heterogeneity: Panel data take into account that individuals may be heterogeneous. Cross-section and time-series studies not controlling this heterogeneity run the risk of obtaining biased results (Hsiao, 2003). If individual behaviors are similar on certain variables, panel data provide the possibility of learning an individual's behavior by observing the behavior of others. Thus, it is possible to obtain a more accurate description of an individual's behavior by supplementing observations of the individual in question with data on other individuals (Hsiao, 2007).

Panel data is more informative giving more variability, less collinearity among the variables, more degrees of freedom and more efficiency: Collinearity refers to intercorrelation between variables. Similarly, multicollinearity indicates collinearity among two or more variables. Time series studies are plagued with multicollinearity, but if a cross sectional dimension is available, it is possible to utilize the interindividual differences to reduce the problem of collinearity (Baltagi, 2005). Panel data usually contains more degrees of freedom and more sample variability than cross sectional data, which may be viewed as a panel with only one time period, or time series data, which is a panel with only one cross sectional unit, hence improving the efficiency of econometric estimates (Hsiao, 2007).

Panel data are better able to reveal the dynamics of adjustments: Cross-sectional distributions that seem relatively stable hide a multitude of changes. For example, in measuring unemployment, cross-sectional data can estimate what proportion of population is unemployed at a point in time. Repeated cross-sections can show how this proportion changes over time. Only panel data can estimate what proportion of those who are unemployed in one period can remain unemployed in another period (Baltagi, 2005). While dynamic effects typically cannot be estimated using a cross-sectional data set, a single time series dataset usually cannot provide precise estimates of dynamic coefficients either. Consider, for example, a time-series model

$$y_t = \sum \beta_\tau x_{t-\tau} + u_t \; , \quad t = 1, 2, \ldots, T \; , \tag{4.1}$$

Where x_t is an exogenous variable and u_t is a random disturbance term. Usually fairly strict multicollinearity exists among explanatory variables, since in general x_t is near x_{t-1}. Therefore there is no sufficient information to obtain precise estimates of any of the lag coefficients without specifying a priori that every one of them is a function of only a very small number of parameters. If panel data are available, utilizing the interindividual differences allows one to reduce the problem of collinearity and obtain more accurate estimates of coefficients (Hsiao, 2003)

Panel data are better able to identify and measure effects that are simply not detectable in pure cross section or pure time series data: For example, consider a cross-sectional data of women with a 50 percent average yearly labor force participation rate. This might be due to each woman having a 50 percent change of being in the labor force in any given year, or 50 percent of the women working all the time and 50 percent not working at all. Only panel data could discriminate between these two cases (Baltagi, 2005).

Panel data models allow us to construct and test more complicated behavioral models than purely cross-section or time-series data: When evaluating the effects of a particular operation by comparing the target group to a control group, conventional cross sectional studies often run into trouble with the fact that the individuals in the target group are different from the individuals in the control group. In other words, the effect of the operation is not simultaneously observed on a single individual, but individuals are rather observed as either having or not having the operation. This approach can cause bias in the studies. Panel data would allow us to observe the same individuals before and after the operation, and therefore help to identify any real effects (Lumpkin, 1996).

Panel data models allow us to construct and test more complicated behavioral models than purely cross-section or time-series data. : When evaluating the effects of a particular operation by comparing the target group to a control group, conventional cross sectional studies often run into trouble with the fact that the individuals in the target group are different from the individuals in the control group. In other words, the effect of the operation is not simultaneously observed on a single individual, but individuals are rather observed as either having or not having the operation. This approach can cause bias in the studies. Panel data would allow us to observe the same individuals before and after the operation, and therefore help to identify any real effects (Hsiao, 2007).

4.7.1.2 Disadvantages of Panel Data

There are also some issues and challenges related to the use of panel data that must be considered. These include the following:

Design and data collection problems: These are the challenges and problems that arise when considering the collection of data sets. The problems include issues regarding coverage, non-response, recall, frequency of interviewing, interview spacing, reference period, the use of bounding, and time-in-sample bias (Baltagi, 2005). The collection of panel data is also obviously much more costly than the collection of cross sectional or time series data (Hsiao, 2003). This problem is more concerned with primary datasets.

Distortions of measurement errors: Measurement errors can occur for several reasons. Common reasons are faulty responses due to unclear questions, memory errors, deliberate distortion of responses, inappropriate informants, misrecording of responses, and interviewer effects (Kalton *et al*., 2005). Measurement errors can lead to under-identification of an econometric model (Hsiao, 2007).

Selectivity problems: A frequently observed source of bias in both cross-sectional and panel data studies are that the sample that cannot be randomly drawn from the population. This sort of bias is known as selectivity bias (Hsiao, 2007). Selectivity problems can be separated in three classes: Self-selectivity, non response, and attrition. Self-selectivity problems arise, for example, in situations where people do not want to work because the reservation wage is higher than the offered wage. If inferences were made on the wage of individuals, a truncated sample would have to be considered. Non-response problems may arise due to not being able to get every individual on the sample to participate. Attrition problems are closely related to non-response problems. Because of the time-dimension in panel data studies, the collection of data from different time periods on the same individuals can become difficult. For example, people can die or move to somewhere out of reach, or companies can go bankrupt. Attrition means the effect of losing some of the respondents in every time period (Baltagi, 2005).

4.7.2 Panel Data Regression

A regular cross sectional regression model has indexing on its variables denoting individuals, and a regular single time series has indexing denoting time period. Panel data regression combines both of these, thus having double indexing on its variables. For example, a simple panel data regression model could be of the form

$$y_{it}=\alpha+\beta' X_{it}+u_{it}\ ,\quad i=1,2,\dots,N\ ;t=1,2,\dots,T\ , \tag{4.2}$$

where i denotes the cross sectional dimension and t denotes the time series dimension. y_{it} is a dependent variable, α is a scalar, β is a [Kx1] vector of the regression coefficients, and X_{it} is an observation on *i*th individual in t^{th} time period on K explanatory variables. u_{it} is an error component of the model, which is usually of either an one-way form or a two-way form. Most of the panel data applications utilize a one-way error component model for the disturbances. It is of the form

$$u_{it}=\mu_i+\nu_{it}\ , \tag{4.3}$$

Where μ_i denotes the unobservable individual-specific time-invariant effects, and ν_{it} denotes the remainder disturbances (Baltagi, 2005). For example, in case where y_{it} measures a relative change of sale of a company, X_{it} may contain observable variables like size and age of the company, and a change in the number of personnel. The unobservable company-specific effects that are not included in the regression are captured by the u_{it}. These may include effects like the managerial skills of the company's executives, motivation of the employees, and available resources of the company.

Another common form of the error component of the model (4.2) is a two-way error component. A two-way error component differs from one-way component in that it has an additional time-specific individual-invariant component. Thus it is of the form

$$u_{it}=\mu_i+\lambda_t+\nu_{it}\ . \tag{4.4}$$

In the previous example, the λ_t could contain factors like effects of business cycle and economic situation of the industry. The model (4.2) can be further divided as either fixed effects model or random effects model based on the terms of error component of the model that can be assumed as a fixed constant or as having random variation.

In the case of fixed effects model, μ_i and λt are assumed as fixed parameters to be estimated and the remainder disturbances stochastic with ν_{it} independent and identically distributed as IID $(0, \sigma_v^2)$. The X_{it} are assumed as independent of ν_{it} for all i and t . In the random effects model, the μ_i and λ_t are assumed random. In this case, $\mu_i \sim$ IID $(0, \sigma_\mu^2)$, $\lambda_t \sim$ IID $(0, \sigma_\lambda^2)$ and $\nu_{it} \sim$ IID $(0, \sigma_v^2)$. These are also assumed to be independent of each other. In addition, X_{it} is independent of μ_i, λ_t and ν_{it} for all i and t (Baltagi, 2005).

4.7.3 Estimation Models- Types of Panel Data Regression Models

In this section, two estimation methods are presented for various types of panel data regression models. First, an estimator for fixed effects one-way error component regression model called least-squares dummy-variable estimator is introduced. Second, an estimator for random effects one-way error component model called generalized least-squares estimator is derived.

4.7.3.1 Fixed Effect Model or Least-squares dummy-variable estimator

The least-squares dummy-variable estimator can be used to obtain estimates of coefficients for a fixed effects panel data model with one-way error component. In fixed effects models the equation (4.2) has the error term of the form (4.3). The time-invariant individual-specific component is assumed to be a fixed constant, and therefore computationally lighter methods can be used than in the case of random effects.

Equation (4.2) can be written in a vector form as

$$Y=\begin{bmatrix} y_1 \\ y_2 \\ \vdots \\ y_N \end{bmatrix}=\alpha+\begin{bmatrix} e \\ 0 \\ \vdots \\ 0 \end{bmatrix}\mu_1+\begin{bmatrix} 0 \\ e \\ \vdots \\ 0 \end{bmatrix}\mu_2+\ldots+\begin{bmatrix} 0 \\ 0 \\ \vdots \\ e \end{bmatrix}\mu_N+\beta'\begin{bmatrix} x_1 \\ x_2 \\ \vdots \\ x_N \end{bmatrix}+\begin{bmatrix} u_1 \\ u_2 \\ \vdots \\ u_N \end{bmatrix} \qquad \textbf{(4.5)}$$

where

$$\underset{T\times 1}{y_i}=\begin{bmatrix} y_{i1} \\ y_{i2} \\ \vdots \\ y_{iT} \end{bmatrix}, \quad \underset{T\times K}{X_i}=\begin{bmatrix} x_{1i1} & x_{2i1} & \cdots & x_{Ki1} \\ x_{1i2} & x_{2i2} & \cdots & x_{Ki2} \\ \vdots & \vdots & & \vdots \\ x_{1iT} & x_{2iT} & \cdots & x_{KiT} \end{bmatrix},$$

$$\underset{1\times T}{e'}=(1,1,\ldots,1), \quad \underset{1\times T}{u_i'}=(u_{i1},\ldots,u_{iT})$$

$$E(u_i)=0, \quad E(u_i u_i')=\sigma_u^2 I_T, \quad E(u_i u_j')=0 \quad if\ i\neq j$$

and I_T is a T x T identity matrix. If the assumptions in the section 4.6.2 are valid, the best linear unbiased estimator for (4.5) is the ordinary least-squares estimator (OLS). In this case the OLS-estimator can be obtained by minimizing

$$\sum_{i=1}^{N} u_i' u_i=\sum_{i=1}^{N}\sum_{t=1}^{T} v_{it}^2=\sum_{i=1}^{N}\sum_{t=1}^{T}(y_i-e\mu_i-\beta x_i-\alpha)'(y_i-e\mu_i-\beta x_i-\alpha) \qquad \textbf{(4.6)}$$

subject to a restriction

$$\sum_{i=1}^{N}\mu_i=0. \qquad \textbf{(4.7)}$$

Utilizing the restriction and solving the marginal conditions yield

$$\hat{\alpha}=\bar{y}-\beta'\bar{x}, \qquad (4.8)$$

$$v_i=\bar{y}_i-\hat{\alpha}-\beta'\bar{x}_i, \qquad (4.9)$$

Where

$$\bar{y}=\frac{1}{NT}\sum_{i=1}^{N}\sum_{t=1}^{T}y_{it}, \quad \bar{x}=\frac{1}{NT}\sum_{i=1}^{N}\sum_{t=1}^{T}x_{it}.$$

When substituting (4.8) and (4.9) into (4.7) and taking partial derivatives with respect to **β**, it is obtained

$$\hat{\beta}=\left[\sum_{i=1}^{N}\sum_{t=1}^{T}(x_{it}-\bar{x}_i)(x_{it}-\bar{x}_i)'\right]^{-1}\left[\sum_{i=1}^{N}\sum_{t=1}^{T}(x_{it}-\bar{x}_i)(y_{it}-\bar{y}_i)\right] \qquad (4.10)$$

which is also called the least-squares dummy-variable estimator (LSDV).

4.7.3.2 Random Effects Model / Generalized Least Square

In a case of finite sample size, where μ_i are assumed to be random, the OLS estimator is not the best linear unbiased estimator anymore. Because u_{it} and u_{is} both contain μ_i, the values of the error term are correlated. Therefore the generalized least-squares estimator becomes the best linear unbiased estimator.

A random effects panel data model with one-way error component is of the form (4.2). The error term is (4.2), where μ_i are assumed as random. A model of this form can be rewritten as

$$\underset{T\times 1}{y_i}=\underset{T\times(K+1)}{\tilde{X}_i}\underset{(K+1)\times 1}{\delta}+\underset{T\times 1}{u_i}, \quad i=1,2,\ldots,N, \qquad (4.11)$$

Where

$$\tilde{X}_i=(e,X_i),$$
$$\delta'=(\alpha,\beta'),$$
$$u_i'=(u_{i1},\ldots,u_{it})$$
$$u_{it}=\mu_i+v_{it}.$$

The covariance matrix of $\mathbf{u_i}$ is

$$E\,u_iu_i'=\sigma_v^2 I_T+\sigma_\mu^2 ee'=V, \qquad (4.12)$$

and its inverse is

$$V^{-1}=\frac{1}{\sigma_{\nu}^{2}}\left[I_{T}-\frac{\sigma_{\mu}^{2}}{\sigma_{\nu}^{2}+T\,\sigma_{\mu}^{2}}ee'\right] \tag{4.13}$$

The normal equations for the GLS-estimators are

$$\left[\sum_{i=1}^{N}\tilde{X}_{i}'V^{-1}\tilde{X}_{i}\right]\boldsymbol{\delta}_{\boldsymbol{GLS}}=\sum_{i=1}^{N}\tilde{X}_{i}'V^{-1}\boldsymbol{y}_{i}. \tag{4.14}$$

Equation (4.13) can be rewritten as

$$V^{-1}=\frac{1}{\sigma_{\nu}^{2}}\left[\left(I_{T}-\frac{1}{T}ee'\right)+\Psi\frac{1}{T}ee'\right]=\frac{1}{\sigma_{\nu}^{2}}\left[Q+\Psi\frac{1}{T}ee'\right] \tag{4.15}$$

Where

$$\Psi=\frac{\sigma_{\nu}^{2}}{\sigma_{\nu}^{2}+T\,\sigma_{\mu}^{2}}.$$

Now (4.14) can be written as

$$\left[W_{tild\,X\tilde{X}}+\Psi\,B_{\tilde{X}\tilde{X}}\right]\begin{bmatrix}\hat{\alpha}\\ \hat{\beta}\end{bmatrix}_{GLS}=W_{\tilde{X}y}+\Psi\,B_{\tilde{X}y}\quad, \tag{4.16}$$

Where

$$T_{\tilde{X}\tilde{X}}=\sum_{i=1}^{N}\tilde{X}_{i}'\tilde{X}_{i},\quad B_{\tilde{X}\tilde{X}}=\frac{1}{T}\sum_{i=1}^{N}(\tilde{X}_{i}'ee'\tilde{X}_{i}),\quad W_{\tilde{X}\tilde{X}}=T_{\tilde{X}\tilde{X}}-B_{\tilde{X}\tilde{X}},$$

$$T_{\tilde{X}y}=\sum_{i=1}^{N}\tilde{X}_{i}'y_{i},\quad B_{\tilde{X}y}=\frac{1}{T}\sum_{i=1}^{N}(\tilde{X}_{i}'ee'y_{i}),\quad W_{\tilde{X}y}=T_{\tilde{X}y}-B_{\tilde{X}y}.$$

Here matrices $B_{\tilde{X}\tilde{X}}$ and $B_{\tilde{X}y}$ contain the sums of squares and sums of cross products between groups. $W_{\tilde{X}\tilde{X}}$ and $W_{\tilde{X}y}$ are the corresponding matrices within groups. $T_{\tilde{X}\tilde{X}}$ and $T_{\tilde{X}y}$ are the corresponding matrices for total variation. Solving (4.16) yields

$$\begin{bmatrix}\Psi NT & \Psi T\sum_{i=1}^{N}\bar{\boldsymbol{x}}_{i}\\ \Psi T\sum_{i=1}^{N}\bar{\boldsymbol{x}}_{i} & \sum_{i=1}^{N}X_{i}'QX_{i}+\Psi T\sum_{i=1}^{N}\bar{\boldsymbol{x}}_{i}\bar{\boldsymbol{x}}_{i}'\end{bmatrix}\begin{bmatrix}\hat{\alpha}\\ \hat{\beta}\end{bmatrix}_{GLS}=\begin{bmatrix}\Psi NT\bar{y}\\ \sum_{i=1}^{N}X_{i}'Qy_{i}+\Psi T\sum_{i=1}^{N}\bar{\boldsymbol{x}}_{i}\bar{y}_{i}\end{bmatrix}. \tag{4.17}$$

From here can be obtained

$$\hat{\beta_{GLS}} = \left[\frac{1}{T} \sum_{i=1}^{N} X_i' Q X_i + \Psi \sum_{i=1}^{N} (\bar{x}_i - \bar{x})(\bar{x}_i - \bar{x})' \right]^{-1} \times \left[\frac{1}{T} \sum_{i=1}^{N} X_i' Q y_i + \Psi \sum_{i=1}^{N} (\bar{x}_i - \bar{x})(\bar{y}_i - \bar{y})' \right] \quad \textbf{(4.18)}$$

and

$$\hat{\alpha_{GLS}} = \bar{y} - \hat{\beta_{GLS}}' \bar{x} \ , \quad \textbf{(4.19)}$$

4.7.4 Fixed Effects or Random Effects

The choice between Fixed and Random Effects can make a surprising amount of difference in the estimates of the parameters, especially when there are only few observations available for different individuals over time (Hsiao, 2003). A general rule has been presented by Baltagi (2005) that the fixed effects model is an appropriate choice if the focus is on a specific set of N individuals and the inference is restricted to the behavior of this set. The random effects model is an appropriate choice in the situation where a random sample from of N individuals is drawn from a large population. In this case, it is important to confirm that the panel is representative and can be generalized to the whole population. In other words, the issue is not whether μ_i is fixed or random, but rather whether or not μ_i can be viewed as random draws from a common population, or whether the conditional distribution of μ_i given X_{it} can be viewed as identical across i (Hsiao, 2003). One way to decide whether to use a fixed effects or a random effects model is to test for misspecification of (4.2), where μ_i is assumed to be random and uncorrelated with X_{it} (Hsiao, 2003). There are several specification tests for this. Hausman test is a statistical test which evaluates significance of an estimator against another estimator (Hausman. 1978). Hausman test can be used to compare the estimates of fixed and random effects model, both of which are consistent under the null hypothesis but which will have different probability limits if H_0 is not satisfied (Baltagi, 2005).

$$H_0 : E(u_{it} | X_{it}) = 0 \ , \quad \textbf{(4.20)}$$

4.8 MODELS SPECIFICATION

The regression models used in the study are based on the combination of earlier work of various researchers such as Biddle *et al.*, 1997; Chen and Dodd, 1997, 2000; Kramer and Pushner, 1997; Elali, 2006; Ismail, 2006; and Erasmus, 2008 etc. To achieve the various objectives of the study and to test the research hypotheses, panel regression model is used.

The data is analyzed with **E-Views** version 6 and **SPSS** version 18 software. Following Biddle *et al.*, 1997; Worthington and West, 2004; and Elali, 2006, EVA is broken down into five components i.e., Cash Flow From Operations (OCF), Accounting Accruals (ACC), After Tax Interest Cost (ATI), Capital Charge (CC) and Stern-Stewart Accounting Adjustments (ADJ) in order to examine the contribution of each components towards explaining contemporaneous MVA as compared to other measures. The dependent variable is given as MVA. Apart from above five components of EVA, the independent or explanatory variables include EVA, EPS, RONW, ROCE, NOPAT, NI and RI. These models are described along with their results in chapter 5 of the thesis.

4.9 CONCLUSION

The purpose of this chapter is to describe the research methodology used in this study. First section of the chapter specifies the various research questions and hypotheses to be tested to achieve the objectives of the study. The second section is dedicated to sample size and sources of data to be use in the study. This is followed by a detailed description of the research variables and rationale behind using variables in the present study along with a calculation methodology and framework of research variables. The next section is dedicated to research technique applied to achieve the objectives. The present study applies Panel data regression technique to test various hypotheses. The detailed description of panel data regression, its advantages and types of panel data regression have also been presented in this section. Last section describes the specification of research model used to test the hypotheses and answer research questions.

Notes

1. **PROWESS** is a firm level database from **Centre for Monitoring Indian Economy** Pvt. Ltd (CMIE) of over 10,000 Indian companies. It contains detailed normalized data culled from the audited annual accounts, stock exchanges, company announcements, etc. It has over ten years of time-series and is updated with the latest data on a daily basis. CMIE was established in 1976. The Centre for Monitoring Indian Economy monitors the Indian economy, builds databases, undertakes research, produces documents and database products and services its clients' needs for economic and business information.
2. Non-financial companies include manufacturing and service companies and are included in the sample as defined in the Prowess database. Manufacturing industry includes companies from Food & beverages, textile, chemical, metals and metal products, non- metallic mineral products, machinery, transport equipments, miscellaneous etc. in manufacturing sector. Service industry includes companies from information technology, computer software, business consultancy, hospital and health care, real estate infrastructure services, shipping, tourism and hotel and restaurant services.
3. Capitaline Plus provides fundamental and market data on more than 20,000 Indian listed and unlisted companies, classified under more than 300 industries, along with powerful analytic tools. Extensive data and analysis on every company profile, directors, more than 10-year financials (P&L, balance sheet, cash flow, consolidated financial data, segment data, forex data, R&D data, ratios, etc), quarterly results, ownership pattern, finished products, raw materials, share price data,

directors' report, management discussion, notes to account, business news, corporate events, etc. Capitaline Plus is a sister product of Capital Market, India's foremost investment fortnightly. The specialized expertise in data collection, standardization and presentation built up since 1985 has earned Capitaline Plus the highest level of respect and confidence in the financial information Industry.

4. Stern- Stewart India and Business Today (BT) have conducted a study of Indian companies titled as *India's Biggest Wealth Creators* during 2002-2004. The study was published in Business Today (Business Today is the largest-circulated business fortnightly in India) and popularly known as BT-SS study. In the survey they identified various important adjustments for calculations of EVA and its components as per Indian GAAP.
5. The Reserve Bank of India, Central Bank of India maintains a data base of Indian economy. This database provides information about the banking, finance, foreign exchange, capital market, corporate houses and various other sector of the economy. It also include reports on foreign exchange liquidity, ownership details of central and state government securities, quarterly estimate of GDP by expenditure approach and industry-wise details of Index of Industrial Production (IIP). The database on Indian economy have 216 reports (subject and frequency wise), 74 subject-wise and 53 frequency-wise data query templates covering various sectors of the Indian economy.
6. BSE SENSEX or Bombay Stock Exchange Sensitivity Index is a value-weighted index composed of 30 stocks that started January 1, 1986. The Sensex is regarded as the pulse of the domestic stock markets in India. It consists of the 30 largest and most actively traded stocks, representative of various sectors, on the Bombay Stock Exchange. These companies account for around fifty per cent of the market capitalization of the BSE. SENSEX today is widely reported in both domestic and international markets through print as well as electronic media. It is scientifically designed and is based on globally accepted construction and review methodology. Since September 1, 2003, SENSEX is being calculated on a free-float market capitalization methodology. The "free-float market capitalization-weighted" methodology is a widely followed index construction methodology on which majority of global equity indices are based; all major index providers like MSCI, FTSE, STOXX, S&P and Dow Jones use the free-float methodology.
7. For detail see *Business Today, February 17, 2002 issue.*

CHAPTER 5
DATA ANALYSIS & RESULT PRESENTATION – I (AGGREGATE LEVEL)

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Preview

The present chapter is based on analysis of Economic Value Added (EVA) and conventional performances measures in explaining the MVA of the sample companies during the study period. The main objective was to examine the efficacy of various performance measures at aggregate level. Hypotheses formed in the last chapter are tested using panel data regression method. Before running the panel data regression, test for stationarity, Fixed effects test and Hausman specification test in panel data set was examined. The results of panel unit root tests strongly support to stationary of all the variables used in the present study. Further based on the results of Hausman specification test, it was found that fixed effects models are suitable for the present data set and thus results of fixed effects panel data regression results are presented in the thesis. The results of correlation analysis indicates that there exists a positive relationship between EVA and MVA of Indian companies in which value based measure such as EVA has statistically significant influence on the shareholder value. Additionally, EVA is a useful measure of corporate performance as it has positive association with MVA when used in univariate regression. While the results of relationship between EVA and MVA are significant, much of the variation of MVA remains unexplained. Results of the hypothesis I conclude that the level of EVA is not only a better proxy but is also better predicator of Market Value Added (MVA) than the level of Net Operating Profit After Tax (NOPAT). Hypothesis II as examined using relative information content test and incremental information content test refute the claims made by EVA proponents that EVA outperforms traditional performance measures in explaining shareholder wealth (as measured by MVA). The results found no support for the Stern Stewart claim that EVA has greater information than earnings. In contrast, the evidence points to Earnings Per Share (EPS) having higher incremental information content than EVA. Although, hypothesis III regarding components analysis of EVA indicates there is significant difference in value relevance of EVA components and components unique to EVA explain MVA better than those that are not but overall results of the present study refute the claim of EVA superiority in explaining the MVA as compared to traditional measures in Indian companies during the period 2000-2009.

5.1 INTRODUCTION

As discussed in the last chapter, the present study uses panel data regression method to test the hypotheses. Panel data regression is a comparatively reliable technique for a sample of cross-sectional time series data (Ismail, 2006). The empirical analysis of this thesis focuses on the contemporaneous relationship between MVA and various corporate financial performance measures. Specifically, the efficacy of EVA and commonly used conventional performance measures is investigated in explaining the shareholder value. Therefore, the thesis examines the value relevance of various competing performance measures in explaining the MVA of Indian companies and provides empirical evidence about the superiority of these measures in two steps i.e. aggregate approach and disaggregate basis.

Under aggregate approach, results are presented for the overall firms as a whole and in later (disaggregate) approach, the whole data set is divided into different industries and results are analyzed and presented industry wise. The rationale behind using this approach was twofold: First to examine the behavior of various performance measures (value based and traditional) to explain the industry wise market value and second, to know if there is any difference in the explanatory power of the combination of traditional and value based measures when examined industry wise or sector and if so, then to know which performance measures is appropriate for the particular sector or industry.

In this chapter, the empirical results on the basis of aggregate approach are presented. Before presenting the results of various models, some preliminary but essential analysis was carried out. It includes testing the data for stationarity, choice of panel regression models-standard, fixed and random effects, descriptive statistics, and correlation analysis. This was followed by presenting the results of each hypothesis formed in the present study.

5.2 TESTS FOR STATIONARITY

The investigation of stationarity (or non- stationarity) in a time series and cross-sectional data have been closely related to the test for unit roots. Existence of unit roots in a series denotes non- stationarity. The logic behind the use of a panel unit root test is valid in order to combine the information from time series with the information from cross-sectional units. The addition of cross-sectional variations to time series variation improves estimation efficiency, leading to smaller standard errors and, consequently, to higher *t*-ratios. So, it is important to check whether all variables are stationary on levels in which all the variables in levels are *I (0)*. To achieve this, panel unit root tests have been examined and employed. A review by Maddala and Wu (1999) has listed key unit root tests in the recent econometric literature. A set of panel unit root tests was conducted to ensure the robustness of the results. This study incorporates the non-stationary panel unit root tests advocated by Levin, Lin and Chu (LLC, 2002), Im Pesaran and Shin (IPS, 2003), Breitung (2002). A brief description of these tests is specified in the following section along with the results.

5.2.1 The Levin-Lin-Chu (LLC) Test

The conventional Augmented Dickey–Fuller (ADF) test for single-equation is based on the following regression equation:

$$\Delta X_{it} = \alpha_i + \beta_i X_{i,t-1} + \gamma_i t + \sum_{j=1}^{k} \theta_{ij} \Delta X_{i,t-j} + \varepsilon_{it}, \qquad \textbf{(5.1)}$$

The unit root null hypothesis of $\beta_i = 0$ is tested against the one-side alternative hypothesis of $\beta_i < 0$, which corresponds to X_{it} being stationary. This is based on the test statistic $t_{\beta_i} = \hat{\beta}_i / se(\hat{\beta}_i)$ (where $\hat{\beta}_i$ is the OLS estimate of β_i in Equation (5.1) and $se(\hat{\beta}_i)$ is its standard error) since the single-equation ADF test may have low power when the data are generated by a near-unit-root but stationary process. Levin, Lin and Chu (2002) found that the panel approach substantially increases power in finite samples when compared with the single-equation ADF test, proposed a panel-based version of Equation (5.1) that restricts $\hat{\beta}_i$ by keeping it identical across cross- industries as follows:

$$\Delta X_{it} = \alpha_i + \beta X_{i,t-1} + \gamma_i t + \sum_{j=1}^{k} \theta_{ij} \Delta X_{i,t-j} + \varepsilon_{it}, \qquad \textbf{(5.2)}$$

Where i =1, 2,...N indexes across cross-industries. Levin-Lin-Chu tested the null hypothesis of $\beta_1 = \beta_2 = ... = \beta = 0$ against the alternative of $\beta_1 = \beta_2 = ... = \beta < 0$, with the test based on the test statistic $t_\beta = \hat{\beta} / se(\hat{\beta})$ (where $\hat{\beta}$ is the OLS estimate of β in Equation (5.2), and $se(\hat{\beta})$ is its standard error).

The results of LLC test are listed in Table 5.1 for all dependent and independent variables and further for components of EVA. It presents the results of both when a time trend is included (trend) and when a time trend is excluded (No trend). It is clear from the results that all the variables are stationary in both in no trend and trend cases. According to the results of the LLC test, all series are in stationary form when time trend is included as well as when time trend is excluded.

Table 5.1 Results of LLC panel unit root test

No Trend				Trend		
Variable	***Statistics***	***Cross Sections***	***Obs.***	***Statistics***	***Cross Sections***	***Obs.***
MVA	-155.435*	996	8772	-131.115*	996	8596
EVA	-1890.37*	996	8802	-183.189*	996	8603
NOPAT	-131.287*	996	8743	-101.886*	996	8565
ROCE	-92.520*	996	8754	-174.101*	996	8599
RONW	-110.538*	996	8760	-90.113*	996	8602
EPS	-129.808*	996	8755	-121.094*	996	8605
RI	-324.848*	996	8790	-254.787*	996	8603
NI	-466.940*	996	8575	-291.966*	996	8790
OCF	-93.621*	996	8756	-85.776*	996	8616
ACC	-146.779*	996	8765	-105.476*	996	8619
ADJ	-216.141*	996	8808	-151.237*	996	8642
ATI	-360.607*	996	8829	-217.802*	996	8628
CC	-306.049*	996	8786	-254.583*	996	8602

Notes: H_o: non- stationary (unit-root)
*Estimates are statistically significant at $p \leq 0.01$

5.2.2 The Im-Pesaran- Shin (IPS) Test

While the Levin-Lin-Chu panel-based unit root test has become increasingly popular in applied work, one drawback is that β is restricted by being kept identical across regions under both null and alternative hypotheses. Im-Pesaran-Shin (2003) relaxed the assumption of the identical first-order autoregressive coefficients of the Levin-Lin-Chu (LLC) test and developed a panel-based unit root test that allow β to vary across regions under the alternative hypothesis. In addition, Im-Pesaran-Shin tested the null hypothesis of $\beta_1 = \beta_2 = ... = 0$ against the alternative of $\beta_i < 0$, for some i.

This procedure is employed in this study because the IPS test has been found to have superior test power by researchers in economics (Abdullah, 2008) to analyze long-run relationships in panel data. IPS begins by specifying a separate ADF regression for each cross-section with individual effects and no time trend:

$$\Delta y_{it} = \alpha_i + \rho_i y_{i,t-1} + \sum_{j=1}^{p_i} \beta_{ij} \Delta y_{i,t-j} + \varepsilon_{it} \tag{5.3}$$

where $i = 1, \ldots, N$ and $t = 1, \ldots, T$

IPS use separate unit root tests for the N cross-section units. Their test is based on the Augmented Dickey-fuller (ADF) statistics averaged across groups. After estimating the separate ADF regressions, the average of the t-statistics for p_i from the individual ADF regressions, $t_{iT_i}(p_i)$:

$$\bar{t}_{NT} = \frac{1}{N} \sum_{i=1}^{N} t_{iT}(p_i \beta_i) \tag{5.4}$$

The t-bar is then standardized and it is shown that the standardized t-*bar* statistic converges to the standard normal distribution as N and $T \rightarrow \infty$. IPS (1997) proposed a cross-sectionally demeaned version of both test to be used in the case where the errors in different regressions contain a common time-specific component.

Table 5.2 Results of IPS panel unit root test

	No Trend			**With Trend**		
Variable	***Statistics***	***Cross Sections***	***Obs.***	***Statistics***	***Cross Sections***	***Obs.***
MVA	-54.467*	996	8772	-22.361*	996	8596
EVA	-163.834*	996	8802	-71.113*	996	8602
NOPAT	-49.765*	996	8743	-18.643*	996	8565
ROCE	-47.477*	996	8754	-21.7502*	996	8599
RONW	-50.431*	996	8760	-19.372*	996	8602
EPS	-47.273*	996	8755	-21.906*	996	8605
RI	-63.168*	996	8790	-27.235*	996	8603
NI	-60.236*	996	8790	-28.378*	996	8605
OCF	-44.309*	996	8756	-17.059*	996	8616
ACC	-48.657*	996	8765	-19.383*	996	8619
ADJ	-57.055*	996	8808	-21.283*	996	8642
ATI	-71.937*	996	8829	-26.447*	996	8628
CC	-60.350*	996	8786	-27.182*	996	8602

Notes: H_o: non- stationary (unit-root); The normalized IPS t-bar statistics is distributed as $N(0,1)$
*Estimates are statistically significance at $p \leq 0.01$.

5.2.3 Bretiung's Test

As given in Levin *et al.*, (2001), Breitung (2000) has shown that the losses of power are related to the bias correction terms and the detrending bias as given in Im *et al.*, (1997). Breitung proposes a λ_{UB} statistic to overcome these problems. Assuming that the variable y_{it} can be represented as:

$$y_{it}=\mu_i+x_{it} \tag{5.5}$$

where x_{it} is generated by the following autoregressive process (5.6) :

$$x_{it} = \sum_{k=1}^{p+1} \alpha_{ik} x_{i,t-k} + \xi_{it} \tag{5.6}$$

Similarly, the empirical model is expressed below (5.7):

$$y_{it} = \mu_{it} + \sum_{k=1}^{p+1} \alpha_{ik} x_{i,t-k} + \xi_{it} \tag{5.7}$$

Assuming cross-sectional independence and the residuals ξ_{it} are i.i.d., the λ_{UB} statistic tests the following null hypothesis that the process is difference stationary, i.e.,

$$H_0 : \sum_{k=1}^{p+1} \alpha_{ik} - 1 = 0, \text{ for all } i = 1, 2 \ldots N \tag{5.8}$$

Under the alternative, λ_{UB} assumes that panel series is stationary, that is, $\sum_{k=1}^{p+1} \alpha_{ik} - 1 < 0$ for all i. In order to construct a test statistic, Breitung (2000) uses the transformed vectors

$$Y_i^*=AY_i= [y_{i1}^*, yi2^*,\ldots y_{iT}^*,] \tag{5.9}$$

$$X_i^*=BX_i= [x_{i1}^*, xi2^*,\ldots x_{iT}^*,] \tag{5.10}$$

such that $E\ (y_{it}^* x_{it}^*)$ for all ***i*** and ***t*** and (5.9) & (5.10). Breitung shows that the following statistic for the null has a standard normal distribution as $(N, T\rightarrow\propto)_{seq}$ (Eq. (5.11).

$$\lambda_{UB} = \frac{\sum_{i=1}^{N} \sigma_i^{-2} Y_i^{*'} X_i^*}{\sqrt{\sum_{i=1}^{N} \sigma_i^{-2} X_i^{*'} A' A X_i^*}} \tag{5.11}$$

The Breitung (2000) test takes a different approach, transforming the data before computing the regressions so that the standard t statistics can be used. The Breitung test requires that the panels be strongly balanced. When the robust option is specified, a version of the t statistic that is robust to cross-sectional correlation of the error terms is reported. This statistic has an asymptotically normal distribution, when the first T tends to infinity followed by N tending to infinity. The Breitung test assumes that all panels have a common autoregressive parameter. The null hypothesis is that all series contain a unit root. The alternative hypothesis is that rho < 1 so that the series are stationary.

Table 5.3 Results of Breitung t-stat panel unit root test

Common Unit Root Process (Individual effects, individual linear trends)			
Variable	**Statistics**	**Cross Sections**	**Obs.**
MVA	-10.847*	996	8772
EVA	-9.6577*	996	7606
NOPAT	-14.209*	996	7569
ROCE	-17.631*	996	7603
RONW	-16.342*	996	7606
EPS	-14.233*	996	7609
RI	-10.881*	996	7607
NI	-9.7687*	996	7579
OCF	-14.350*	996	7620
ACC	-16.462*	996	7623
ADJ	-11.315*	996	7646
ATI	-7.978*	996	7632
CC	-10.940*	996	7606

Notes: H_o: non- stationary (unit-root)
*Estimates are statistically significant at $p \leq 0.01$

The results of IPS test as presented in Table 5.2 indicate that all the variables are stationarity whether a time trend is excluded or included. Table 5.3 reveals the results of Breitung t-stat for panel unit root test. It is clear from the results of test that similar to LLC and IPS, that all the variables are stationary. Thus the results of panel unit root tests strongly support to stationary of all the variables used in the present study.

5.3 FIXED EFFECTS VS. RANDOM EFFECTS

In the present thesis two sets of tests are conducted; to test the fixed effects model against the standard model (the fixed effects) and the random effects against the fixed effects model (the Hausman test) respectively. The fixed effects test was performed first to see whether the result of standard or fixed effects model is appropriate. The fixed effects test evaluates the statistical significance of the estimated fixed effects. Table AII.1-AII.3 (*refer Annexure- II*) shows the test statistics and p-value without time variable trend for all regressors. The results consist of two tests that evaluate the joint significance of the cross-section effects using sum-of-squares (F- test) and the likelihood function (*chi-square* test). The test is run for the fixed model regressors of all the empirical models. The null hypothesis assumes that the fixed effects are redundant. The results suggest that the corresponding effects are statistically significant. The null hypothesis is therefore rejected in all the models. This indicates that the results of fixed effects models are acceptable in the estimates.

As stated above, Hausman test was conducted to determine whether fixed and/or random effects models are appropriate. Hausman test compares the fixed versus random effects under the null hypothesis that the individual effects are uncorrelated with the other regressors in the model (Hausman, 1978). If correlated (H_0 is rejected), a random effects model produces biased estimators, violating one of the Gauss- Markov assumptions; so a fixed effects model is preferred. Hausman's key findings are that the covariance of an efficient estimator with its difference from an inefficient estimator is zero (Greene, 2003; Baltagi, 2001; Woodridge, 2002). The test results of each of the panel regression models are presented in Table AIII.1-AIII.3 (*refer Annexure-III*). The results found that null hypothesis is rejected thereby indicating that fixed effects models are preferred over random effects in the present thesis.

5.4 EMPIRICAL RESULTS

As discussed in the chapter 4, present study employ panel data regression models to examine the efficacy of traditional and value based financial performance measures in explaining the market value of Indian firms. To achieve this, various hypotheses have been tested using the panel data regression models. Panel data regression models in both fixed and random effects have been analyzed and on the basis of Hausman specification test (as discussed above), fixed effects panel data regression results are presented and examined. As the fixed effects (or dummy variable) model is preferred model, it is used in the remainder of the analysis. Before testing the hypothesis and running panel data regression, the data was examined for normality and heteroscedasticity. Data have been normalized and standardized by detecting outliers and to overcome the problem of heteroscedasticity (due to different size of firms in the sample). All the variables have been deflated by firm's market capitalization for each year. Biddle *et al.*, 1997 Kim, 2006; Erasmus, 2008 also used the similar procedure in their respective research to deal with the size varying problem of the firms under analysis.

5.4.1 Descriptive Statistics

Table 5.4-A presents the mean, median, maximum, minimum and the standard deviations for the variables examined in this study. From the Table 5.4-A, it should be noted that while mean value of MVA, NOPAT, RONW, ROCE, OCF are positive on average, the mean level of EVA is negative which bring out two important observations, ***First*** is the significance of the Cost of Capital (WACC) and implies significant growth expectations for future EVA . Low EVA is also consistent with a potential upward bias in Stern Stewart's cost of capital estimates, that is, when the WACC increases, EVA decreases. ***Second*** in a competitive business scenario, most firms struggle to generate return in excess from their cost of capital. In other words, supernormal growth opportunities are not persistent over time. The pattern of descriptive statistics of the study is in accordance with the patterns reported by Biddle *et al.* 1997; Kramer and Pushner, 1997; Garvey and Milbourn, 2000; Chen and Dodd, 2001; Kramer and Peters, 2001; Worthington & West, 2004; Kim *et al.*, 2004; Pandey, 2005; Elali, 2006; Ismail, 2006; Ranmana, 2007; Erasmus, 2008; Maditinos *et al.*, 2009; Shubita, 2010; and Huang & Liu, 2010;

Table 5.4-A further reveals that NOPAT not only has positive mean value but also the lowest standard deviation followed by OCF, NI and MVA. On the other hand, Table 5.4-B illustrates the correlations between MVA and the independent variables. The correlation coefficients thus reveal statistically significant association between MVA and all of the explanatory variables. In terms of the correlations between the dependent (MVA) and independent variables (EVA, RI, NI, NOPAT, EPS, ROCE and RONW), the highest correlation is observed between MVA and NI followed by EPS, RI and EVA. Most importantly, similar to the findings of Biddle *et al.*, 1997; Chen and Dodd, 1997; Ismail, 2006; Erasmus, 2007, the present study found that EVA has lower correlation with MVA as compared to traditional measures like EPS and NI with the difference that the reported studies have used stock returns as a dependent variable in place of MVA. Importantly, although the Economic Profit measures (EVA and RI) underperform traditional accounting profit measures (NI and EPS), but they still outperform NOPAT and standard accounting measures used by various researchers. Thus on the basis of the results of correlation analysis, one cannot fully refute the claim of EVA proponents that it is highly

associated with MVA, as on the one hand EVA and RI both outperform NOPAT, ROCE, RONW and OCF and on the other hand, they underperform NI and EPS. It definitely requires further investigation.

Table 5.5-A provides the mean, median, maximum, minimum and the standard deviations of the EVA components. Mean and median statistics of both Accruals (ACC) of Market Value Added (MVA) reported negative values. Pearson correlation between MVA and components of EVA is reported in Table 5.5-B. It is clear from the table that MVA is positively associated with Cash Flow From Operations (OCF) and Accounting Accruals (ACC) while negatively correlated with Cost of Capital (CC), After Tax Interest Cost (ATI) and Accounting Adjustments (ADJ). The correlation coefficient between MVA and OCF is highest and statistically significant while lowest correlation coefficient is observed between MVA and ACC also these are not statistically significant. The positive relation between Accounting Accruals and MVA shows that Accruals have hidden value which is reflected in the market value of the companies. Another interesting observation from the correlation matrix is that OCF and ACC are negatively correlated and also not statistically significant. This relationship is consistent with the smoothing effect of accruals on a firm's cash flow from operations (Biddle *et al.*, 1997). Statistically significant positive correlations are found between Cash Flow From Operations (OCF), After Tax- Interest Cost (ATI) and Cost of Capital (CC). According to Biddle *et al.*, (1997), Firms with higher OCF also have higher debt and equity costs. The results about EVA components of the present study are partially consistent with the findings of Biddle *et al.*, 1997; Ismail, 2006; Elali, 2006; and Erasmus, 2008.

Table 5.4-A Descriptive statistics of MVA and Independent Variables (all firms)

	Dependent Variable	Independent Variables							
	MVA	EVA	EPS	NOPAT	OCF	NI	RI	ROCE	RONW
Mean	2.1297	-17.003	8.44206	0.14001	0.37997	-0.1125	-18.071	3.39443	7.16134
Median	0.6188	-7.1119	2.79	0.10287	0.13318	0.06661	-7.3903	4.88	7.64
Maximum	358.722	898.338	1911.62	25.45	36.1403	41.1598	910.471	20560.6	9142.86
Minimum	-152.45	-893.32	-1054.4	-34.288	-29.459	-43.988	-899.74	-16300	-8476.9
Std. Dev.	6.87282	103.881	43.3827	0.88525	1.39192	1.66598	104.747	314.442	156.667

Note: All the variables are deflated by market capitalization of each year.

Table 5.4-B Correlation matrix of MVA and Independent Variables (all firms)

	Dependent Variable	Independent Variables							
	MVA	EVA	EPS	NOPAT	OCF	NI	RI	ROCE	RONW
MVA	1.000								
EVA	0.413**	1.000							
EPS	0.472**	0.077**	1.000						
NOPAT	0.310**	0.002	0.010	1.000					
OCF	0.203*	0.005	0.039**	0.050**	1.000				
NI	0.520**	0.661**	0.130**	0.009	0.023*	1.000			
RI	0.460**	0.679**	0.112**	0.006	0.015	0.878**	1.000		
ROCE	0.367**	0.697**	0.130**	0.008	0.021*	0.877**	.830**	1.000	
RONW	0.412**	0.768**	0.077**	-0.002	0.005	-0.666**	-0.695**	-0.703**	1.000

Note: All the variables are deflated by market capitalization of each year.

* Estimates are statistically significant at $p \leq 0.05$

** Estimates are statistically significant at $p \leq 0.01$

Table 5.5-A Descriptive statistics of MVA and components of EVA

	Dependent Variable	Independent Variables				
	MVA	OCF	CC	ATI	ADJ	ACC
Mean	-2.1297	0.379965	18.21174	0.473002	0.125199	-0.239953
Median	-0.6188	0.133177	7.49877	0.034284	0.027393	-0.030491
Maximum	358.722	36.14025	901.2187	135.6726	18.6049	31.34419
Minimum	-152.45	-29.4588	-911.389	-213.93	-46.4988	-29.4535
Std. Dev.	6.87282	1.391918	104.7808	6.842226	1.178596	1.405514

Table 5.5-B Correlation matrix for MVA and components of EVA

	Dependent Variable	Independent Variables				
	MVA	OCF	CC	ATI	ADJ	ACC
MVA	1.000					
OCF	0.607**	1.000				
CC	-0.004	0.004	1.000			
ATI	-0.095**	0.382**	-0.006	1.000		
ADJ	-0.442**	0.948**	-0.003	0.304**	1.000	
ACC	0.004	-0.004	0.768**	-0.006	-0.003	1.000

Notes: All the variables are deflated by market capitalization

** Estimates are statistically significant at $p \leq 0.01$

5. 5 HYPOTHESES TESTING

The main objective of the present study is to examine the efficacy of value based and conventional financial performance measures in explaining the Market Value Added (MVA) of Indian companies. It is important to highlight here that, though the objective is not to explain the determinants of MVA, but only to show how well value based and traditional financial performance measures acts as an explanatory variables for MVA. It is important to investigate whether value based performance measure is better or traditional performance measures outperform the former in explaining the MVA of Indian companies. This will help in finding out the appropriateness of value based or traditional financial measures to use as performance measurement, managerial compensation, financial reporting and shareholder value creation in Indian companies. Following section examines the hypotheses and presents the results of panel data regression models used to achieve objectives of the study.

5.5.1 Hypothesis I

H1: Economic Value Added is significantly and positively associated with Market Value Added of Indian companies

The main objective to test this hypothesis is to know the relationship between MVA and EVA of the sample companies. Following the earlier work of O'Byrne,1996; Biddle *et al.*, 1997; Elali, 2006;Ismail, 2006;and Kim, 2006, present study test the hypothesis using the following univariate regression model with the dependent variable of Market Value Added (MVA). MVA was deflated by beginning-of-year invested capital[1] and also the independent variable of EVA scaled by beginning-of-year invested capital (Elali, 2006).

$$MVA_{it} = b_0+b_1\ EVA_{it}+ e_{it} \quad \textbf{(5.12)}$$

Where,

MVA_{it} = Market Value Added for firm i in period t
EVA_{it} = Economic Value Added for firm i in period t
e_{it} = random disturbance term
b_o= constant term

Table 5.6-A Results of Fixed effects panel data regression for MVA-EVA relationship

Constant term	Regression coefficients	R^2	Adjusted R^2	ANOVA		D-W
b_0	b_1			F-Stat	Sign	
2.005* (29.600) 0.000	0.010* (16.059) 0.000	0.1916	0.1818	2.134	0.000	2.33

Note: Figures in parentheses refer to t values.
* Estimate is statistically significant at $p\leq 0.01$

Table 5.6-B Results of Fixed effects panel data regression for MVA – NOPAT relationship

Constant term	Regression coefficients	R^2	Adjusted R^2	ANOVA		D-W Stats
b_0	b_1			F-Stat	Sign	
2.017* (29.808) 0.000	1.269* (15.807) 0.000	0.1909	0.1110	2.124	0.000	2.335

Note: Figures in parentheses refer to t values.
* Estimate is statistically significant at $p \leq 0.01$

Before running the model, the problem of first order serial correlation was addressed by analyzing the results of Durbin- Watson (D-W) statistics. The results of D-W test indicate no presence of serial correlation the data. The results of the above regression model (5.12) are presented in Table 5.6-A. As stated earlier, panel data regression was performed in both -fixed effects and random effects. Based on results of fixed effects test and Hausman test, it was concluded that null hypothesis of no fixed effects cannot be accepted; therefore, the use of fixed effects model or Least Square Dummy Variable (LSDV) in the present study is justified.

The overall model yielded a positive and statistically significant coefficient of 0.010 and an R^2 of 0.1916 for the entire sample. Low *p*-value (0.000) of EVA (b_1) implies that the EVA coefficient is statistically significant and allows for the null hypothesis to be rejected. The table further reports the adjusted R- square value of 0.1818 indicating that 18.18 percent of variations in the MVA of Indian companies can be explained by Economic Value Added (EVA). Analysis of Variance (ANOVA) results presented in the Table 5.6-A indicates that *F*- statistics (2.134) is statistically significant with low *p*- value (0.000) thereby indicating that there is positive and strong relationship between MVA and EVA and therefore validating overall significance of regression model. Overall results of Table 5.6-A upholds hypothesis I (that EVA is positively and significantly related to MVA of Indian companies)

Studies by Stweart,1991; Stewart and Chew, 1995; Grant, 1996; Lehn and Makhija, 1996; Milunovich and Tsuei, 1996; O'Byrne,1996; Uyemura *et al.*, 1996; Biddle *et al.*,1997; Chen & Dodd, 2001; Worthington & West, 2001 and 2004; Grant, 2003; Dastgir and Izadinia, 2004; Elali , 2006; Kim, 2006; Mishra & Kanwal, 2007; Visaltanachoti *et al.*, 2008; Kim & Lee, 2009; Maditinos *et al.*, 2009 revealed that the relationship between EVA and stock returns or MVA is positive and statistically significant. The result of the present study about hypothesis I is consistent with former studies with the exception that many of the above studies have used stock returns, in place of MVA as dependent variable for examining the relationship between EVA and shareholder value.

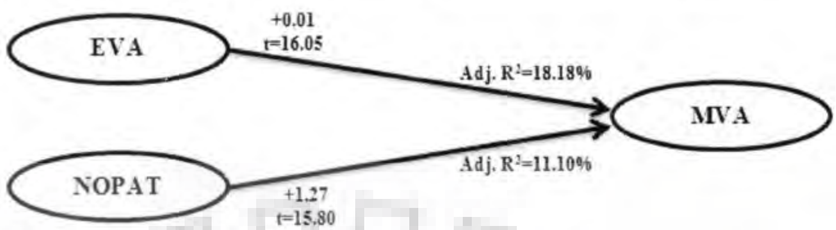
Although the relationship between MVA and EVA is positive and statistically significant, much of the variation of MVA remains unexplained (Adjusted R^2 = 18.18%). In order to obtain more insight into the strength of EVA as a proxy of MVA, Net Operating Profit After Tax (NOPAT) was used as an independent variable in the following model and panel data regression was performed to examine the relationship between MVA and NOPAT:

$$MVA_{it} = b_0+b_1NOPAT_{it}+ e_{it} \quad \textbf{(5.13)}$$

Where,
MVA_{it} = Market Value Added for firm *i* in period *t*
$NOPAT_{it}$ = Net Operating Profit After Tax for firm *i* in period *t*
e_{it} = random disturbance term
b_o= constant term

Table 5.6-B summarizes the results of fixed effects panel data regression model (LSDV). It is clear from the Table 5.6-B that relationship between NOPAT and MVA is positive and statistically significant as the regression coefficient (b_1) is 1.269 with a p<0.000. The positive sign on the NOPAT coefficient along with sufficiently highly t- statistics of 15.807 indicates that NOPAT has a strong effect on MVA. For each rupee increase in NOPAT, there would be Rs 1.269 increase in MVA of sample companies. However, EVA explains slightly more of the total variation in MVA (Adjusted R^2= 18.18%) than NOPAT (Adjusted R^2= 11.10%) does[2]. F-statistics of revealed the statistical significance (p< 0.001) of the model. Figure 5.1 present the comparative relationship of EVA and NOPAT with MVA and it is clear from the results that EVA outperform NOPAT in terms of association with MVA The results of the above model establish that the level of EVA is not only a better proxy but is also better predicator of Market Value Added (MVA) than the level of Net Operating Profit After Tax (NOPAT).

Figure 5.1 Comparative relationships of EVA and NOPAT with MVA



5.5.2 Hypothesis II

H2: EVA dominates conventional performance measures in explaining contemporaneous MVA

The present study compares the value relevance of EVA and conventional performance measures such as ROI, ROE, EPS, NOPAT, NI, RI and OFC in predicting MVA of the sample companies. It is assumed that these measures are positively and highly correlated with MVA of the sample companies and it serves as important predictor of MVA. This hypothesis is in line with the earlier work by Biddle *et al.*, 1997; Chen and Dodd, 1997; Lehan and Makhija, 1997; Feltham *et al.*, 2004; Worthington & West, 2004; Elali, 2006; Ismail, 2006; Kim, 2006. Further, it is also hypothesized that EVA would outperform conventional performance in explaining the variation in the MVA of the companies. Studies by Lehan and Makhija, 1997; Feltham *et al.*, 2004, Worthington & West, 2004; Urbanczyk *et al.*, 2005; Elali, 2006; and Erasmus, 2008 also proved that value based measures such as EVA are more strngly associated with stock returns and firm values than accrual earnings, Residual Income or cash flow from operations. Relative Information content and Incremental Information content tests are performed to examine the superiority of EVA over conventional performance measures.

To examine the value- relevance[3] of Economic Value Added (EVA) over the traditional financial performance measures, the following multivariate regression model was applied :

$$MVA_{it} = b_0+b_1EVA_{it} + b_2EPS_{it} + b_3\,ROCE_{it} + b_4RONW_{it}+ b_5OCF_{it}+ b_6NOPAT_{it}+ b_7\,NI_{it}+ b_8RI_{it} + e_{it} \quad \textbf{(5.14)}$$

Where

MVA_{it} = Market Value Added for firm *i* in period *t*
EVA_{it} = Economic Value Added for firm *i* in period *t*
EPS_{it} = Earnings Per Share for firm *i* in period *t*

$ROCE_{it}$ = Return On Capital Employed for firm i in period t
$RONW_{it}$ = Return On Net Worth for firm i in period t
OCF_{it} = Cash Flows From Operations for firm i in period t
$NOPAT_{it}$ = Net Operating Profit After Tax for firm i in period t
NI_{it} = Net Income for firm i in period t
RI_{it} = Residual Income for firm i in period t
e_{it} = random disturbance term
b_o = constant term

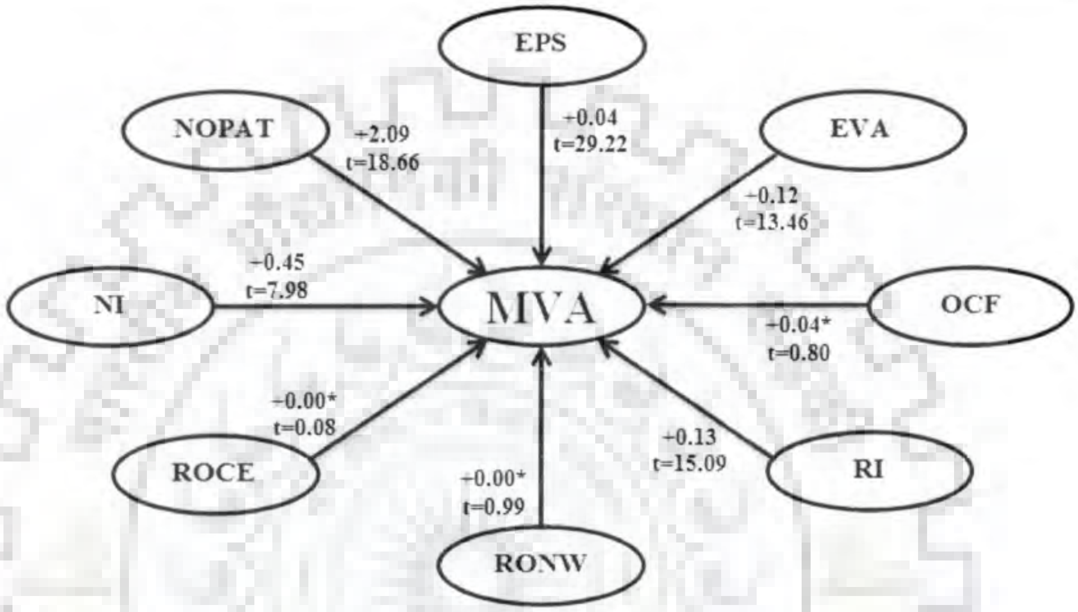
The variables in the above model were scaled by market capitalization to overcome the problem of heteroscedasticity. As previously mentioned, the data under study is panel data also known as pooled data and it consists of a combination of time-series and cross-sectional data. To choose between fixed effects model (LSDV) and random effects model (RE), the Hausman (1978) specification test was used[4]. The Hausman statistics rejects the null hypothesis for regression model and signifies that the random-effects model is not appropriate; hence, fixed effects model was preferred and analyzed.

Table 5.7 shows the estimated coefficients, t- statistics, R- square, adjusted R- square[5] and ANOVA results of the multivariate pooled regression model (5.14). It is clear from the results of fixed effects panel regressions that all the financial performance metrics (EVA, NOPAT, ROCE, RONW, EPS, NI, RI and OCF) are found to be positively associated with the changes in shareholders' value (MVA) of sample Indian companies. The coefficients for EVA, EPS, NOPAT, NI and RI are 0.124, 0.045, 2.09, 0.457 and 0.1325 respectively and all are statistically significant at $p \leq 0.01$, whereas the coefficients of ROCE, RONW and OCF are although positively correlate with MVA but not statistically significant. Examination of R- square and adjusted R- square statistics reveals that approximately 41% and 33% of the changes in the Market Value Added (MVA) of Indian companies can be explained by all the explanatory variables together.

As summarized in Table 5.7, the results of above multivariate regression provides two important results, firstly it provides strong evidence about the significance and direction of the relationships between MVA and explanatory variables as earlier hypothesized and, secondly, establishes a baseline to analyze the incremental value relevance of EVA over other measures. The results of the multivariate regression model 5.14 of the present study are similar to the earlier work of Biddle *et al.*, 1997; Chen & Dodd, 1997, 2001; Kramer & Pushner, 1997; Eljelly and Alghurair, 2001; Worthington & West, 2001 and 2004; Tian *et al.*, 2003; Ismail, 2006; Kim, 2006; Erasmus, 2008; Maditions *et al.*, 2006, 2009; Lee and Kim, 2009; Shubita, 2010;

ArabSalehi and Mahmoodi, 2011 who also revealed that earnings(NOPAT, NI, EPS, OCF) have more association with MVA and stock returns as compared to EVA and RI.

Figure 5.2 Regression coefficients for independent variables with MVA



*Indicates that t-value for the coefficient is not statistically significant at $p \leq 0.01$.

Table 5.7 Multivariate regression results for MVA with various measures

Variable		Overall	EVA	EPS	ROCE	RONW	OCF	NOPAT	NI	RI
		b_0	b_1	b_2	b_3	b_4	b_5	b_6	b_7	b_8
Constant term		1.905 (28.121) 0.000								
Regression coefficients			0.124* (13.466) 0.000	0.045* (29.228) 0.000	0.000 (0.084) 0.993	0.000 (0.992) 0.321	0.044 (0.802) 0.422	2.091* (18.664) 0.000	0.457* (7.988) 0.000	0.132* (15.094) 0.000
R^2		0.412								
Adjusted R^2		0.335								
ANOVA	F -value	4.064								
	Sig.	0.000								
D-W Statistics		2.328								

Note: Figures in parentheses refer to t values.
*Estimate is statistically significant at $p \leq 0.01$

5.5.2.1 Relative Information Content Test

Following the research work on value relevance of financial performance measures by Jennings, 1990; Biddle *et al.*, 1995&1997; Lehn & Makhija, 1996; Bao & Bao, 1998; Chen & Dodd, 2001; Jalili, 2002; Worthington & West, 2001 and 2004; Feltham *et al.*, 2004; Elali, 2006; Ismail, 2006; Kim, 2006; Erasmus, 2007; Visaltanachoti *et al.*, 2008; Kim & Lee, 2009; and ArabSalehi and Mahmoodi, 2011 the hypothesis II was tested using a two step process. In the ***first step***, the value-relevance of each of the eight explanatory variables (EVA, NOPAT, NI, RI, RONW, ROCE, OCF and EPS) was evaluated using univariate regression. To achieve this, each of these eight variables was specified as the explanatory variable in separate regressions with MVA as the dependent variable. Both relative and incremental information content approaches[6] were employed to test the hypothesis. The relative information content approach used to find out whether one measure provides greater information content than the other, while the incremental information content comparisons aims to assess whether one accounting measure (or set of measures) provides information content grater then provided by another (Biddle *et al.*, 1995). In order to examine the Relative information content test (value relevance or information content) of EVA and traditional accounting performance measures, the following regression models were examined and analyzed:

$$MVA_{it} = b_0+b_1EVA_{it}+ e_{it} \quad \textbf{(5.15)}$$
$$MVA_{it} = b_0+b_1EPS_{it}+ e_{it} \quad \textbf{(5.16)}$$
$$MVA_{it} = b_0+b_1ROCE_{it}+ e_{it} \quad \textbf{(5.17)}$$
$$MVA_{it} = b_0+b_1RONW_{it}+ e_{it} \quad \textbf{(5.18)}$$
$$MVA_{it} = b_0+b_1OCF_{it}+ e_{it} \quad \textbf{(5.19)}$$
$$MVA_{it} = b_0+b_1NOPAT_{it}+ e_{it} \quad \textbf{(5.20)}$$
$$MVA_{it} = b_0+b_1NI_{it}+ e_{it} \quad \textbf{(5.21)}$$
$$MVA_{it} = b_0+b_1RI_{it}+ e_{it} \quad \textbf{(5.22)}$$

Where

MVA_{it} = Market Value Added for firm *i* in period *t*
EVA_{it} = Economic Value Added for firm *i* in period *t*
EPS_{it} = Earnings Per Share for firm *i* in period *t*
$ROCE_{it}$ = Return On Capital Employed for firm *i* in period *t*
$RONW_{it}$ = Return On Net Worth for firm *i* in period *t*
OCF_{it} = Cash Flows From Operations for firm *i* in period *t*
$NOPAT_{it}$ = Net Operating Profit After Tax for firm *i* in period *t*
NI_{it} = Net Income for firm *i* in period *t*
RI_{it} = Residual Income for firm *i* in period *t*
e_{it} = random disturbance term
b_0 = constant term

The value-relevance of each of the variables was then assessed by comparing R- squares for above regressions. This is done by ranking the performance measures on the basis of explanatory power of each of the performance measures- as measured by R- square. Table 5.8-A display the results of univariate regression models. Again here also the Hausman test was performed to know whether fixed effects model (LSDV) is preferred or random effects model is preferred. The test statistics confirm that null hypothesis of no fixed effects cannot be accepted, therefore the use of fixed effects model is justified.

Regression results reveal that univariate coefficients of the all the independent variables are found to be positively associated with changes in the Market Value Added of Indian companies. Regression coefficients of EVA, EPS, RONW, OCF, NOPAT, RI and NI are statistically significant whereas coefficient ROCE is not statistically significant at given level of significance ($p \leq 0.01$). The high t-statistics of EVA, EPS, RONW, OCF, NOPAT, RI and NI (16.059, 27.704, 15.791, 15.807, 13.403 and 17.142) indicates that these variables are reliable predictor of shareholder value (as measured by MVA). Highest coefficient of NOPAT and OCF (1.269 & .831) indicates that these variables have significant effect on MVA. These results are in line with many studies cited above. ANOVA statistics exhibits statistical significance among all the models with a low *p*- value ($p < 0.01$).

Table 5.8-B displays the results of relative information contents test. Relative information content was measured by comparing the explanatory power of all measures. Using seminal work of Biddle *et al.*, (1995) on the issue and following the earlier work of Biddle *et al.*, 1997; Chen & Dodd, 2001; Worthington & West, 2001 and 2004; Ismail, 2006; Kim, 2006; Maditions *et al.*, 2006, 2009; Erasumus, 2008; Kim & Lee, 2009; and Arab Salehi and Mahmoodi, 2011 adjusted R^2 of the eight separate regression models was analyzed. The measures are arranged in decreasing sequence based on their adjusted R^2 values and are presented in the Table 5.8-B. It is evident from the table that adjusted R^2 of different measures range from 7.60 percent to 21.89 percent.

Table 5.8-A Univariate panel data regression

Model	Constant term	Regression coefficients	R^2	Adjusted R^2	ANOVA		D-W statistics
	b_0	b_1			F-Stat	Sign	
5.15	2.005 (29.600) 0.000	0.010* (16.059) 0.000	0.1916	0.1818	2.134	0.000	2.33
5.16	2.564 (38.656) 0.000	0.045* (27.704) 0.000	0.2340	0.2189	2.749	0.000	2.31
5.17	-2.192 (-32.389) 0.000	0.000 (0.276) 0.781	0.1684	0.0760	1.822	0.000	2.32
5.18	-2.199 (-32.475) 0.000	0.001** (2.383) 0.017	0.1689	0.0766	1.829	0.000	2.32
5.19	1.880 (27.015) 0.000	0.831* (15.791) 0.000	0.1909	0.1010	2.123	0.000	2.34
5.20	2.017 (29.808) 0.000	1.269* (15.807) 0.000	0.1909	0.1110	2.124	0.000	2.33
5.21	2.200 (32.422) 0.000	0.070*** (1.646) 0.099	0.1687	0.0763	1.826	0.000	2.32
5.22	1.982 (29.267) 0.000	0.011* (17.142) 0.000	0.1948	0.1912	2.177	0.000	2.33

Note: Figures in parentheses refer to t values.
*Estimates are statistically significant at $p \leq 0.01$
**Estimates are statistically significant at $p \leq 0.05$
***Estimates are statistically significant at $p \leq 0.10$

It means that none of the variables is able to explain more than 22 percent of variations in the market value of Indian companies. From the analysis of adjusted R^2, it is clear that EPS has a significantly higher adjusted R^2 value (21.89 percent) than the other measures. It is followed by RI (19.12%), EVA (18.18%), NOPAT (11.10%), OCF (10.10%), RONW (7.66%), ROCE (7.63%) and NI (7.60%). From the above results, it is clear that there exists a statistically significant difference in the information content of the various performance measures and null hypothesis (*i.e.,* no difference in the information content of various measures) is rejected in favor of alternate hypothesis.

A point worth noting is that the adjusted R^2 values of RI and EVA are found to be close to one another (19.12 percent and 18.18 percent respectively) and also, although EVA significantly outperforms NOPAT, OCF, RONW, ROCE and NI, but it underperforms EPS and RI. Another interesting finding of the present study is that explanatory power of NOPAT (Net Operating Profit After Tax) is found to be significantly higher than that of NI.

Most of the findings of the present study found to be consistent with those proposed by Biddle *et al.*, (1997) who report that Earnings Before Extraordinary Income (EBEI) was more associated with stock return than either of RI. Studies by Chen & Dodd, 2001; Worthington & West, 2001, 2004; Ismail, 2006 also reported that mandated corporate financial performance measures outperformed RI and EVA. De Villiers and Auret (1998) revealed that EPS outperforms EVA. They concluded that EVA does not offer any advantage over the traditional measures. Erasmus (2007) in his study about value based and conventional performance measures conclude that EBEI outperforms EVA. Interestingly, the result about Residual Income (RI) in the present study is very much consistent (RI is second best in explaining the changes in MVA) with those of Erasums, 2007; Visaltanachoti *et al.*, 2008. The other studies by various researchers like Dodd and Chen, 1996; Kramer and Pushner, 1997; Clinton & Chen, 1998; Ferguson and Leistikow, 1998; Ray, 2001; and Kim, 2006 also concluded that mandated traditional performance measures outperforms EVA and RI in explaining market value of firms.

Finally the results of the relative information content (univariate) lead to the conclusion that although EVA is important, but it does not significantly outperform EPS. Residual Income (RI), also referred to as Economic Profit ranked second followed by EVA. Statistically, there is very less difference in explanatory power of RI and EVA. Therefore, relative information content test results about Indian companies refute the claim of EVA proponents that EVA is by far the best financial performance measure that explains the changes in the market value. On the contrary, earnings dominate in explaining the changes in MVA in Indian companies

Figure 5.3 Association of explanatory variables with MVA- univariate regression

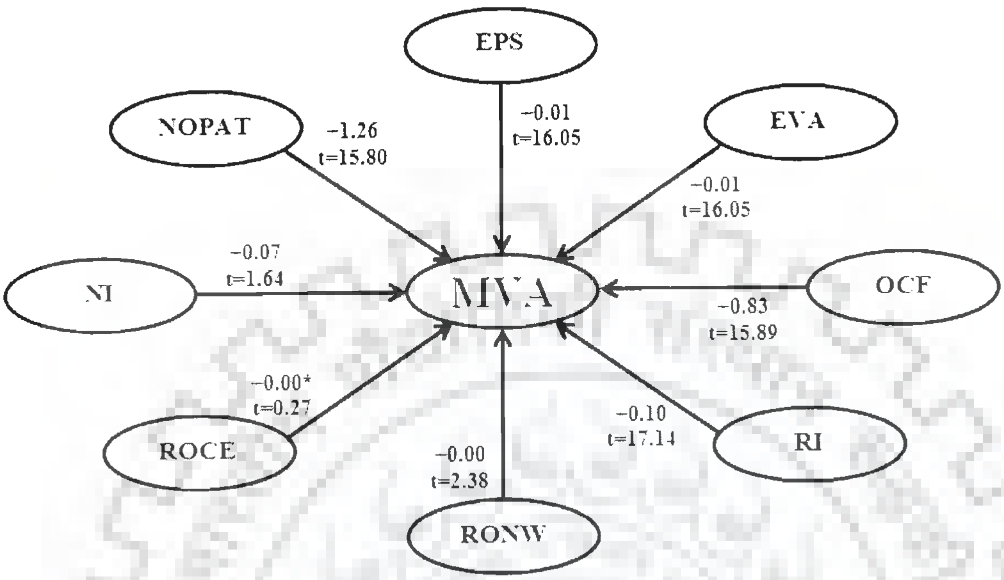


Table 5.8-B Relative value relevance test (Individual variables)

Variable	Adjusted R^2	Rank Order
EPS	21.89%	1
RI	19.12%	2
EVA	18.18%	3
NOPAT	11.10%	4
OCF	10.10%	5
RONW	7.66%	6
NI	7.63%	7
ROCE	7.60%	8

In the ***second step***, a set of tests were conducted to know which of the eight predictors of shareholder value provides value-relevance beyond that, provided by other measures. In these tests, each of the eight independent variables was paired alternatively with each other in a multivariate regression to know their relative information content when paired with each other.

5.5.2.1.1 Value relevance of Economic Value Added (EVA) over other measures

The value-relevance of EVA over various performance measures was examined using following pair wise regressions:

$$MVA_{it} = b_0+b_1EVA_{it} + b_2\,RI_{it} + e_{it} \quad (5.23)$$
$$MVA_{it} = b_0+b_1EVA_{it} + b_2\,NI_{it} + e_{it} \quad (5.24)$$
$$MVA_{it} = b_0+b_1\,EVA_{it} + b_2\,NOPAT_{it} + e_{it} \quad (5.25)$$
$$MVA_{it} = b_0+b_1EVA_{it} + b_2\,OCF_{it} + e_{it} \quad (5.26)$$
$$MVA_{it} = b_0+b_1EVA_{it} + b_2RONW_{it} + e_{it} \quad (5.27)$$
$$MVA_{it} = b_0+b_1EVA_{it} + b_2ROCE_{it} + e_{it} \quad (5.28)$$
$$MVA_{it} = b_0+b_1EVA_{it} +b_2EPS_{it} + e_{it} \quad (5.29)$$

Where

MVA_{it} = Market Value Added for firm *i* in period *t*
EVA_{it} = Economic Value Added for firm *i* in period *t*
EPS_{it} = Earnings Per Share for firm *i* in period *t*
$ROCE_{it}$ = Return On Capital Employed for firm *i* in period *t*
$RONW_{it}$ = Return On Net Worth for firm *i* in period *t*
OCF_{it} = Cash Flows From Operations for firm *i* in period *t*
$NOPAT_{it}$ = Net Operating Profit After Tax for firm *i* in period *t*
NI_{it} = Net Income for firm *i* in period *t*
RI_{it} = Residual Income for firm *i* in period *t*
e_{it} = random disturbance term
b_0 = constant term

The pair-wise fixed effects panel data regression results of above models are summarized in Table 5.9. It is clear from the table that regression coefficients of all the models except 5.28 are statistically significant and are found to be positively associated with MVA of the sample companies.

Further examination of R^2 and adjusted R^2 reveal that out of seven alternative pairs of EVA and traditional performance measures, combination of EVA and EPS has highest R^2 and Adjusted R^2 of 25.69 percent and 17.43 percent respectively. This is followed by combination of EVA and NI with a value 19.19 percent and 17.35 percent respectively for R^2 and adjusted R^2. Also combination of EVA and ROCE has not only lowest R^2 and adjusted R^2 (19.17% and 10% respectively) values and not statistically significant. ANOVA results also confirms that all the models are statistically significant ($p \leq 0.01$) and pair wise combination of EVA and traditional measures have significant value relevance in explaining the MVA. Overall results suggest that out of the above pair wise regressions, combination of EVA and EPS represents the most satisfactory explanation for MVA.

Table 5.9 Fixed effects regressions results of value relevance for EVA over other variables

Model	Constant term	Regression coefficients		R^2	Adjusted R^2	ANOVA		D-W Statistics
	b_0	b_1	b_2			F-Stat	Sign	
5.23	-1.858* (-27.541) 0.000	0.137* (14.537) 0.000	0.147* (15.720) 0.000	0.2133	0.1258	2.438	0.000	2.33
5.24	2.013* (29.640) 0.000	0.010* (16.056) 0.000	0.069* (4.033) 0.000	0.1919	0.1735	2.135	0.000	2.32
5.25	1.845* (27.261) 0.000	0.010* (15.590) 0.000	1.216* (15.331) 0.000	0.2123	0.1247	2.423	0.000	2.33
5.26	1.743* (25.105) 0.000	0.009* (14.559) 0.000	0.746* (14.26) 0.000	0.2096	0.1217	2.384	0.000	2.34
5.27	2.012* (29.685) 0.000	0.010* (16.050) 0.000	0.001* (2.334) 0.000	0.1921	0.1023	2.138	0.000	2.33
5.28	2.005* (29.600) 0.000	0.010* (16.058) 0.000	0.000 (0.293) 0.7695	0.1917	0.1017	2.131	0.000	2.33
5.29	2.377* (35.863) 0.000	0.010* (16.633) 0.000	0.044* (28.059) 0.000	0.2569	0.1743	3.108	0.000	2.31

Figures in parentheses refer to *t* - values
* Estimates are statistically significant at $p \leq 0.01$

5.5.2.1.2 Value relevance of Earnings Per Share (EPS) over other measures

The value-relevance of EPS over various performance measures have been examined using following pair wise panel regressions:

$$MVA_{it} = b_0+b_1\ EPS_{it} + b_2RI_{it} + e_{it} \quad \textbf{(5.30)}$$
$$MVA_{it} = b_0+b_1\ EPS_{it} +b_2NI_{it} + e_{it} \quad \textbf{(5.31)}$$
$$MVA_{it} = b_0+b_1\ EPS_{it} + b_2NOPAT_{it} + e_{it} \quad \textbf{(5.32)}$$
$$MVA_{it} = b_0+b_1EPS_{it} + b_2OCF_{it} + e_{it} \quad \textbf{(5.33)}$$
$$MVA_{it} = b_0+b_1EPS_{it} + b_2RONW_{it} + e_{it} \quad \textbf{(5.34)}$$
$$MVA_{it} = b_0+b_1EPS_{it} + b_2ROCE_{it} + e_{it} \quad \textbf{(5.35)}$$

Where

MVA_{it} = Market Value Added for firm *i* in period *t*
EPS_{it} = Earnings Per Share for firm *i* in period *t*
$ROCE_{it}$ = Return On Capital Employed for firm *i* in period *t*
$RONW_{it}$ = Return On Net Worth for firm *i* in period *t*
OCF_{it} = Cash Flows From Operations for firm *i* in period *t*

$NOPAT_{it}$ = Net Operating Profit After Tax for firm *i* in period *t*
NI_{it} = Net Income for firm *i* in period *t*
RI_{it} = Residual Income for firm *i* in period *t*
e_{it} = random disturbance term
b_0 = constant term

Table 5.10 summarizes the results of above pair wise fixed effects regression results. Here, EPS is paired alternatively with RI, NI, NOPAT, OCF, RONW and ROCE. It is evident from the table that except regression model 5.35, the regression coefficients of all the statistically significant models are at $p<0.01$. Further, all the regression coefficients are positively associated with MVA. Thus, the conclusion is, all the explanatory variables contribute to the explanatory power of the shareholder value. While comparing the explanatory power of alternative pairs, combination of EPS and NOPAT outperform others. EPS and NOPAT together have ability to explain around 18.36 percent (also a highest R- square value of 26.54%) changes in the MVA. It is followed by a combination of EPS and RI with an R^2 and Adjusted R^2 value of 25.94 percent and 17.74 percent respectively. EPS when combined with ROCE contributes lowest to the explanatory power of MVA and also with statistically insignificant ROCE coefficient.

Table 5.10 Fixed effects regressions results of value relevance for EPS over other variables

Model	Constant term	Regression coefficients		R^2	Adjusted R^2	ANOVA		D-W Statistics
	b_0	b_1	b_2			F-Stat	Sign	
5.30	2.354* (35.526) 0.000	0.044* (28.0395) 0.000	0.011* (17.653) 0.000	0.2597	0.1774	3.155	0.000	2.31
5.31	2.600* (39.048) 0.000	0.046* (28.186) 0.000	0.217* (5.253) 0.000	0.2363	0.1514	2.782	0.000	2.30
5.32	2.382* (36.315) 0.000	0.048* (30.131) 0.000	1.505* (19.565) 0.000	0.2654	0.1836	3.248	0.000	2.31
5.33	-2.280* (-33.214) 0.000	0.042* (26.679) 0.000	0.713* (14.021) 0.000	0.2504	0.1670	3.003	0.000	2.32
5.34	2.568* (38.692) 0.000	0.044* (27.642) 0.000	0.000* (2.599) 0.000	0.2342	0.1490	2.749	0.000	2.31
5.35	2.564* (38.652) 0.000	0.044* (27.701) 0.000	0.000 (0.033) 0.973	0.2340	0.1488	2.746	0.000	2.31

Note: Figures in parentheses refer to *t* -values
* Estimates are statistically significant at $p \leq 0.01$

5.5.2.1.3 Value relevance of Return On Capital Employed (ROCE) over other measures

Based on the work of Elali (2006) and Maditions *et al.* (2009), value relevance of ROCE over other conventional performance measures, following multivariate regression models are analyzed:

$$MVA_{it} = b_0+b_1ROCE_{it} + b_2\,RI_{it} + e_{it} \quad \textbf{(5.36)}$$
$$MVA_{it} = b_0+b_1ROCE_{it} + b_2NI_{it} + e_{it} \quad \textbf{(5.37)}$$
$$MVA_{it} = b_0+b_1ROCE_{it} + b_2NOPAT_{it} + e_{it} \quad \textbf{(5.38)}$$
$$MVA_{it} = b_0+b_1ROCE_{it} + b_2OCF_{it} + e_{it} \quad \textbf{(5.39)}$$
$$MVA_{it} = b_0+b_1ROCE_{it} + b_2RONW_{it} + e_{it} \quad \textbf{(5.40)}$$

Where

MVA_{it}	= Market Value Added for firm *i* in period *t*
$ROCE_{it}$	= Return On Capital Employed for firm *i* in period *t*
$RONW_{it}$	= Return On Net Worth for firm *i* in period *t*
OCF_{it}	= Cash Flows From Operations for firm *i* in period *t*
$NOPAT_{it}$	= Net Operating Profit After Tax for firm *i* in period *t*
NI_{it}	= Net Income for firm *i* in period *t*
RI_{it}	= Residual Income for firm *i* in period *t*
e_{it}	= random disturbance term
b_0	= constant term

Table 5.11 shows the detailed results from the pair wise combinations of ROCE and other traditional performance measures. It can be noticed that regression coefficients of 5.36 and 5.40 are positively associated as well as statistically significant at $p \leq 0.01$ and at $p \leq 0.05$. Since most of coefficients although positively associated with MVA but are not statistically significant when paired with ROCE, it can be concluded that ROCE is not a reliable predictor of market value of Indian companies.

The highest Adjusted R^2 is reported in regression (5.36), which combines RI with ROCE. Most importantly, the explanatory power (adjusted R^2) of all regressions (5.36 to 5.40) ranges approximately 7 percent to 10.52 percent. Most of the traditional performance measures when combined with ROCE are revealing very less variation in the changes in market value, thereby leaving the large variation unexplained. ANOVA values however, reveals that all the models are statistically significant with low $p \leq 0.000$. Combination of NOPAT and ROCE (R^2= 10.10) follow RI and ROCE.

Table 5.11 Fixed effects regressions results of value relevance for ROCE over other variables

Model	Constant term	Regression coefficients		R^2	Adjusted R^2	ANOVA		D-W Statistics
	b_0	b_1	b_2			F-Stat	Sign	
5.36	1.982* (29.267) 0.000	0.000* (2.267) 0.000	0.011* (17.141) 0.000	0.1948	0.1052	2.175	0.000	2.33
5.37	2.201* (32.422) 0.000	0.000 (0.354) 0.723	-0.071 (-1.661) 0.096	0.1688	0.0762	1.824	0.000	2.32
5.38	2.017* (29.812) 0.000	0.000 (0.778) 0.4362	1.271* (15.823) 0.000	0.1910	0.1010	2.122	0.000	2.33
5.39	1.880* (27.011) 0.000	0.000 (0.0258) 0.9794	0.831* (15.787) 0.000	0.1909	0.1009	2.121	0.000	2.34
5.40	2.199* (32.474) 0.000	0.000* (0.235) 0.000	0.001** (2.3786) 0.017	0.1689	0.0765	1.827	0.000	2.32

Note: Figures in parentheses refer to t- values
* Estimates are statistically significant at $p \leq 0.01$
** Estimates are statistically significant at $p \leq 0.05$

5.5.2.1.4 Value relevance of Return On Net Worth (RONW) over other measures

To know the value relevance of RONW over other conventional performance measures, following multivariate regression models are analyzed:

$$MVA_{it} = b_0+b_1RONW_{it} + b_2RI_{it} + e_{it} \qquad \textbf{(5.41)}$$
$$MVA_{it} = b_0+b_1RONW_{it} + b_2NI_{it} + e_{it} \qquad \textbf{(5.42)}$$
$$MVA_{it} = b_0+b_1RONW_{it} +b_2NOPAT_{it} + e_{it} \qquad \textbf{(5.43)}$$
$$MVA_{it} = b_0+b_1RONW_{it} + b_2OCF_{it} + e_{it} \qquad \textbf{(5.44)}$$

Where
MVA_{it} = Market Value Added for firm i in period t
$RONW_{it}$ = Return On Net Worth for firm i in period t
OCF_{it} = Cash Flows From Operations for firm i in period t
$NOPAT_{it}$ = Net Operating Profit After Tax for firm i in period t
NI_{it} = Net Income for firm i in period t
RI_{it} = Residual Income for firm i in period t
\e_{it} = random disturbance term
b_0 = constant term

In order to evaluate the value relevance of RONW over traditional performance measures RI , NI,NOPAT and OCF are paired alternatively with ROCE and regressions models 5.41 to 5.44

are examined and analyzed. Using fixed effects model, panel data regression was performed and results are presented in Table 5.12. It is noted from the table that all the coefficients are positively associated with MVA. Coefficients are also found to be statistically significant and significantly different from zero. In other words, when paired with RONW, they all have significant value relevance. Additionally, the coefficient of NOPAT (1.271) is largest and also statistically significant at 1 percent (p<0.000) level of significance. Most importantly, comparison of adjusted R^2 of ROCE and RONW when paired with traditional performance measures is similar (7.56 percent to 10.57 percent approximately). Pair-wise combination of Residual Income (RI) and RONW has highest Adjusted R^2 value of (10.58%) followed by combination of Net Operating Profit After Tax (NOPAT) and RONW. The results conclude that combination of RI outperform other variables in explaining the contemporaneous market value when paired with RONW.

Table 5.12 Fixed effects regression results of value relevance of RONW over other variables

Model	Constant term	Regression coefficients		R^2	Adjusted R^2	ANOVA		D-W Statistics
	b_0	b_1	b_2			F-Stat	Sign	
5.41	1.989* (29.350) 0.000	0.000* (2.280) 0.000	0.011* (17.127) 0.000	0.1953	0.1057	2.181	0.000	2.33
5.42	2.208* (32.508) 0.000	0.001** (2.398) 0.016	0.071* (1.667) 0.000	0.1692	0.0767	1.830	0.000	2.32
5.43	2.025* (29.902) 0.000	0.001** (2.518) 0.011	1.271* (15.828) 0.000	0.1915	0.1016	2.129	0.000	2.33
5.44	1.888* (27.100) 0.000	0.000** (2.276) 0.022	0.830* (15.773) 0.000	0.1914	0.1014	2.127	0.000	2.34

Note: Figures in parentheses refer to t -values
* Estimates are statistically significant at $p \leq 0.01$
** Estimates are statistically significant at $p \leq 0.05$

5.5.2.1.5 Value relevance of Cash Flow From Operations (OCF) over other measures

Value relevance of OCF over other conventional performance measures is examined using following multivariate regression models:

$$MVA_{it} = b_0+b_1OCF_{it} + b_2\,RI_{it} + e_{it} \quad \textbf{(5.45)}$$
$$MVA_{it} = b_0+b_1OCF_{it} + b_2\,NI_{it} + e_{it} \quad \textbf{(5.46)}$$
$$MVA_{it} = b_0+b_1OCF_{it} + b_2\,NOPAT_{it} + e_{it} \quad \textbf{(5.47)}$$

Where

MVA_{it}	= Market Value Added for firm *i* in period *t*
OCF_{it}	= Cash Flows From Operations for firm *i* in period *t*
$NOPAT_{it}$	= Net Operating Profit After Tax for firm *i* in period *t*
NI_{it}	= Net Income for firm *i* in period *t*
RI_{it}	= Residual Income for firm *i* in period *t*
e_{it}	= random disturbance term
b_0	= constant term

Panel data Regression analysis of above multivariate models have been alternatively performed in order to know the value relevance of OCF when paired with Residual Income (RI), Net Income (NI) and Net Operating Profit After Tax (NOPAT). Table 5.13 indicates that all corporate financial performance measures are positively associated with MVA and also statistically significant. Net Operating Profit After Tax has highest impact on the MVA, as revealed in earlier regression models in the present study. The table further reveals that Residual Income is most significant when paired with OCF. It is consistent with earlier pair wise combination examined. Worthington and West (2001, 2004) also found that Residual Income is most significant by itself and when paired with Cash Flow From Operations (OCF). Pair wise regression of RI and Cash Flow From Operations (OCF) explains 12.41 percent variation in the MVA followed by combination of NOPAT and OCF.

Table 5.13 Fixed effects regressions results for value relevance of OCF over other variables

Model	Constant term	Regression coefficients		R^2	Adjusted R^2	ANOVA		D-W Statistics
	b_0	b_1	b_2			F-Stat	Sign	
5.45	1.731* (29.946) 0.000	0.727* (13.887) 0.000	0.010* (15.395) 0.000	0.2117	0.1241	2.415	0.000	2.34
5.46	1.891* (27.147) 0.000	0.844* (15.994) 0.000	0.127* (3.005) 0.002	0.1917	0.1018	2.132	0.000	2.34
5.47	1.801* (25.990) 0.000	0.667* (12.389) 0.000	1.019* (12.410) 0.000	0.2046	0.1161	2.312	0.000	2.34

Note: Figures in parentheses refer to *t* -values

* Estimates are statistically significant at $p \leq 0.01$

5.5.2.1.6 Value relevance of Net Operating Profit After Tax(NOPAT) over other measures

Value relevance of NOPAT over other traditional measures is examined using following multivariate regression models:

$$MVA_{it} = b_0+b_1NOPAT_{it} + b_2RI_{it} + e_{it} \quad \textbf{(5.48)}$$

$$MVA_{it} = b_0+b_1NOPAT_{it} + b_2NI_{it} + e_{it} \quad \textbf{(5.49)}$$

Where

MVA_{it} = Market Value Added for firm i in period t

$NOPAT_{it}$ = Net Operating Profit After Tax for firm i in period t

NI_{it} = Net Income for firm i in period t

RI_{it} = Residual Income for firm i in period t

e_{it} = random disturbance term

b_0 = constant term

Value relevance of NOPAT over other traditional performance measures can be analyzed by using a pair-wise multivariate regression with RI and NI respectively. Fixed effects panel data regression models results of 5.48 and 5.49 are presented in Table 5.14. The regression results reveal that coefficients of Residual Income (RI) and Net Income (NI) exhibit positive and statistical significant relationship with MVA along with coefficients of NOPAT. High *t*- value of RI, NI and NOPAT indicates the strong relationship between explanatory variables and shareholders. With an adjusted R^2 of 12.84%, NOPAT and RI (pair wise) and statistically significant results reveals that such combination outperforms NOPAT and NI (adjusted R^2 = 11.66%). The results conclude that combination of NOPAT and RI outperforms pair wise combination of NOPAT and NI in explaining the MVA of Indian companies. Overall association of MVA and pair wise combination of regressions 5.48 and 5.49 are statistically significant as evident from significant *F*- statistics.

Table 5.14 Fixed effects regressions results for value relevance of NOPAT over other variable

Model	Constant term	Regression coefficients		R^2	Adjusted R^2	ANOVA		D-W Statistics
	b_0	b_1	b_2			F-Stat	Sign	
5.48	1.821* (26.919) 0.000	1.218* (15.395) 0.000	0.011* (16.761) 0.000	0.2155	0.1283	2.470	0.000	2.33
5.49	1.798* (25.946) 0.000	2.207* (20.252) 0.000	0.723* (12.598) 0.000	0.2050	0.1166	2.318	0.000	2.35

Note: Figures in parentheses refer to *t*- values, * Estimates are statistically significant at $p \leq 0.01$

5.5.2.1.7 Value Relevance of Net Income (NI) over Residual Income (RI)

Value relevance of Net Income over other RI, was examined using following multivariate regression model:

$$MVA_{it} = b_0+b_1NI_{it} + b_2RI_{it} + e_{it} \qquad \textbf{(5.50)}$$

Where

MVA_{it} = Market Value Added for firm i in period t
NI_{it} = Net Income for firm i in period t
RI_{it} = Residual Income for firm i in period t
e_{it} = random disturbance term
b_0 = constant term

Using the above regression model, value relevance of NI over RI was examined by analyzing regression results given in Table 5.15. Pair wise analysis of regression coefficients reveal that both NI and RI is reliable predictor and positively related with MVA, as found in the univariate regressions. High t-statistics (17.911, 17.156) about NI and RI reveals there is strong relationship between explanatory and dependent variables. The explanatory power of NI and RI is 10.55 percent and results are statistically significant. The overall results about statistically significance conclude that model is significant with low $p \leq 0.01$.

Table 5.15 Fixed effects regressions results of value relevance of NI over RI

Model	Constant term	Regression coefficients		R^2	Adjusted R^2	ANOVA		D-W Statistics
	b_0	b_1	b_2			F-Stat	Sign	
5.50	1.991* (29.322) 0.000	0.075* (17.911) 0.000	0.011* (17.156) 0.000	0.1951	0.1055	2.179	0.000	2.33

Note: Figures in parentheses refer to t-values
* Estimates are statistically significant at $p \leq 0.01$

The pair wise R^2 of all regression models (5.22 to 5.50) is summarized in Table 5.16-A. Adjusted R^2 of regression models is arranged in the decreasing order. One interesting and important observation from pair wise regression is that as EPS is in four out of top five pair wise regressions which explains MVA the best possible way, there is already an indication that it is a highly significant explanatory factor. Coefficients of determination (R^2) of pair wise regression of five combinations that explains MVA the best possible way is EPS/NOPAT (26.54%), EPS/RI (25.97%), EVA/EPS (25.69%), EPS/OCF (25.05%) and EPS/RONW (23.42%). The results of relative information content of pair wise regression conclude that combination of EPS and NOPAT outperform other measures in explaining the MVA of sample companies. Information content test of Maditions *et al.*, (2009) conclude that EPS when combined with various measures outperform EVA.

Table 5.16-A Regression results of relative value relevance test (Pair wise combination)

Pair-wise combination	R^2
EPS/NOPAT	26.54%
EPS/RI	25.97%
EVA/EPS	25.69%
EPS/OCF	25.04%
EPS/NI	23.63%
EPS/RONW	23.42%
EPS/ROCE	23.40%
NOPAT/RI	21.56%
EVA/RI	21.34%
EVA/NOPAT	21.23%
OCF/RI	21.18%
EVA/OCF	20.96%
NOPAT/NI	20.50%
OCF/NOPAT	20.46%
OCF/NI	19.57%
RONW/RI	19.53%
NI/RI	19.51%
ROCE/RI	19.48%
EVA/ROCE	19.21%
EVA/NI	19.19%
EVA/RONW	19.17%
RONW/NOPAT	19.15%
RONW/OCF	19.14%
ROCE/NOPAT	19.10%
ROCE/OCF	19.09%
RONW/NI	16.92%
ROCE/RONW	16.89%
ROCE/NI	16.88%

Note: Pair wise Regression results are arranged in the order of decreasing R^2.

5.2.2.2 Incremental Information Content Test

After analyzing the pair wise combination of various financial performance measures, incremental value relevance of each measure is calculated by taking the R- squares from pair wise regressions and subtracting the individual R-squared obtained in the first step (univariate regressions). For example, taking the R-square from regression equation (5.23), and subtracting the individual R-square for RI obtained in the univariate regression (5.22), gives the incremental value relevance of EVA over RI. Again taking the R-square from regression equation (5.24), and subtracting the individual R-square for NI obtained in the univariate regression (5.21), gives the incremental value relevance of EVA over NI and similarly for other pair wise regressions.

Table 5.16-B presents the results of incremental information content tests for all explanatory variables. For example in Table 5.16-B, EPS/NI (16.00 percent) is equal to the information content of pair wise comparison of EPS and NI (23.63 percent) from Table 5.10 minus the relative information content of NI (7.63 percent) from the Table 5.8-A. The pair wise combination of EVA, EPS, NI, NOPAT, ROCE, RONW, RI and OCF indicates that EPS when combined with traditional measures (NI, ROCE, RONW, NOPAT and OCF) represents the most satisfactory explanation for the Market Value Added (MVA) in the Indian market. The results are similar to studies by Worthington & West (2004); Chen and Dodd, 2001; Maditions *et al.*, 2009 which also revealed that Earnings dominate EVA in explaining MVA.

The results indicate that Earnings Per Share (EPS) exhibits the largest(16.00 percent) incremental information content among the measures, with EVA (3.80 percent), RI (-2.77 percent), NOPAT (-10.79 percent), RONW (-14.23 percent), NI (- 14.29 percent) and ROCE (-14.29 percent) providing only limited incremental information content beyond earnings. The most logical pairing of information variables in explaining market value is therefore composed of EPS and NI. Traditional measures outperform value based measures in providing incremental information content. These results along with results of relative information content test refute the claims made by EVA proponents that EVA outperform traditional performance measures in explaining shareholder wealth (as measured by MVA).Thus, results of present study fail to support the Stern Stewart claim that EVA has greater information than earnings. In contrast, the evidence points to Earnings Per Share (EPS) having higher incremental information content than EVA.

Table 5.16-B Results of incremental information content test (H2)

	EPS/NI	EPS/ ROCE	EPS/ RONW	EPS/ NOAPT	EPS/OCF	NOPAT/ NI	OCF/NI
Adj.R^2	16.00%	15.77%	15.76%	15.44%	14.94%	12.87%	11.94%
	EVA/ ROCE	EVA/NI	EVA/ RONW	EVA/OCF	EVA/ NOPAT	OCF/ NOPAT	RONW/NI
Adj.R^2	11.58%	11.56%	11.51%	10.86%	10.13%	9.36%	9.29%
	ROCE/ NI	ROCE/ RONW	RONW/ OCF	ROCE/ OCF	RONW/ NOPAT	ROCE/ NOPAT	EPS/RI
Adj.R^2	9.25%	9.23%	9.04%	8.99%	8.05%	8.00%	6.85%
	EVA/EP S	NOPAT/ RI	EVA/RI	OCF/RI	RONW/RI	NI/RI	ROCE/RI
Adj.R^2	3.80%	2.44%	2.22%	2.06%	0.41%	0.39%	0.36%
	RI/ROC E	RI/NI	RI/RONW	RI/OCF	RI/NOPAT	EPS/EVA	NOPAT/ ROCE
Adj.R^2	11.52%	11.49%	11.46%	9.02%	8.02%	3.71%	3.50%
	NOPAT/ RONW	OCF/RO CE	OCF/ RONW	NOPAT/ OCF	RI/EVA	RONW/ ROCE	NI/ROCE
Adj.R^2	3.44%	2.5%	2.44%	1.00%	0.94%	0.06%	0.03%
	NI/RON W	NI/OCF	RI/EPS	NI/ NOPAT	NOPAT/ EVA	OCF/EVA	RONW/ EVA
Adj.R^2	-0.03%	-2.47%	-2.77%	-3.47%	-7.08%	-8.08%	-10.52%
	NI/EVA	ROCE/E VA	NOPAT/ EPS	OCF/EPS	RONW/ EPS	NI/EPS	ROCE/EPS
Adj.R^2	-10.55%	-10.58%	-10.79%	-11.79%	-14.23%	-14.26%	-14.29%

5.5.3 Hypothesis III

H3: Components unique to EVA helps in explaining contemporaneous MVA beyond other measures.

Hypothesis III analyses whether components unique to EVA have greater information and usefulness over other components. Following Biddle *et al.*, 1997; Bao & Bao, 1998; Chen & Dodd, 2001; Worthington and West, 2001, 2004); Elali, 2006; Ismail, 2006; Kyriazis and Anastassis, 2007; and Erasmus, 2008, the present study disintegrate the components of EVA into five parts. The rational for using this approach is to examine the Stern Stewart claim that components unique to EVA have more impact on shareholder value as compared to other components. This part of analysis addresses the empirical question about which components of

EVA contributes most to variation in MVA, and hence explaining MVA. To examine the value-relevance of EVA components, the following regression model was used:

$$MVA_{it} = b_0 + b_1OCF_{it} + b_2ACC_{it} + b_3ATI_{it} + b_4CC_{it} + b_5ADJ_{it} + e_{it} \quad \textbf{(5.51)}$$

Where

MVA_{it}	= Market Value Added for firm *i* in period *t*
OCF_{it}	= Cash Flows From Operations for firm *i* in period *t*
ACC_{it}	= Accounting Accruals for firm *i* in period *t*
ATI_{it}	= After-Tax Interest Expense for firm *i* in period *t*
CC_{it}	= Cost of Capital for firm *i* in period *t*
ADJ_{it}	= Accounting Adjustment for firm *i* in period *t*
e_{it}	= random disturbance term
b_0	= constant term

The above multivariate regression model was estimated using a pooled time- series and cross-sectional least square regression. The dependent variable is MVA for firm *i* in period *t*, and the explanatory variables are OCF, ADJ, CC, ATI and ACC. Following, Biddle *et al.*, 1997; Erasmus, 2008; Visaltanachoti *et al.*, 2008, the present study expects a positive association between Cash Flow From Operations (CFO) and Accruals (ACC) with MVA. Given the fact that the direction of change for Accounting Adjustments (ADJ) may vary across firms in the sample depending on both financing and operations (GAAP-related accounting adjustments can either be positive or negative), it is somewhat difficult to postulate the relationship between GAAP adjustments and market returns. So, no *a priori* coefficient is postulated. Further, negative association of After Tax Interest Cost (ATI) and Cost of Capital (CC) is expected with MVA.

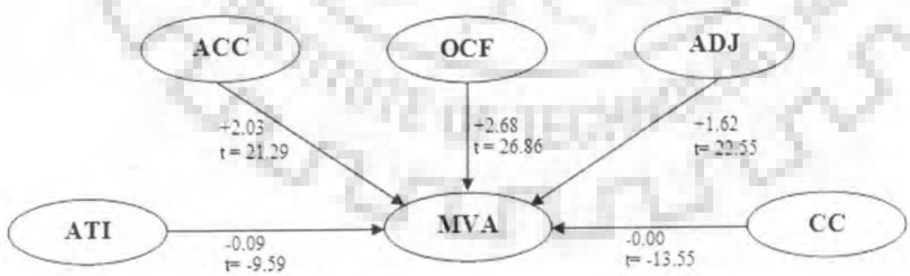
Table 5.17 and figure 5.4 summarizes the results of multivariate regression using fixed effects panel regression model. Analysis of Hausman test about the regression model 5.51 reveals that fixed effects model was appropriate and results of fixed effects regression model was presented. It is evident from the table that the all the regression coefficients are statistically significant with a high *t*-statistics showing all the variable has strong relationship with MVA. Cash flow from operations (OCF) is positively associated with MVA and has highest regression coefficient (2.684) revealing that it has maximum influence on the MVA. Along with OCF, ACC and ADJ are positively associated with MVA, whereas ATI and CC are negatively correlated with MVA as hypothesized. Results of all the coefficients are consistent with the earlier studies of Biddle *et al.*, 1997; Ismail, 2006; Erasmus, 2008; Visaltanachoti *et al.*, 2008. Adjusted R^2 (a measure of coefficient of determination) value of 0. 1942 conclude that 19.42% of the variation in the MVA is revealed by components model (EVA components). Statistical significant of the EVA component model with F-value of 3.401($p \leq 0.01$)) provide a baseline for analyzing the relative and incremental value-relevance of EVA components.

Table 5.17: Fixed effects panel regression result for EVA components

		Overall	OCF	ACC	ATI	CC	ADJ
Constant term		-1.246* (-18.069) 0.000					
Predicted signs:			+	+	-	-	+
Regression coefficients		N= 9960	2.684* (26.864) 0.000	2.039* (21.336) 0.000	-0.092* (-9.593) 0.000	-0.008* (-13.556) 0.000	1.624* (22.555) 0.000
R^2		0.275					
Adjusted R^2		0.194					
ANOVA	F- Stat.	3.401					
	Sig.	0.000					
D-W Statistics		2.346					

Note: Figures in parentheses refer to t- values
* Estimates are statistically significant at $p \leq 0.01$

Figure 5.4 Regression coefficients for components of EVA



5.5.3.1 Relative Information Content Test

Again, following value relevance methodology similar to used in hypothesis II, this hypothesis was tested using a two-step process. In the ***First step***, relative value relevance of each of the components of EVA i.e., OCF, ADJ, ACC, CC and ATI was evaluated using univariate regressions.

To achieve this, each of these five variables was specified as explanatory variables in separate regressions with MVA as the dependent variable. Both relative and incremental information content approaches were employed to test the hypothesis. In order to examine the Relative information content test (value relevance or information content) of components of EVA, following regression models was examined and analyzed.

$$MVA_{it} = b_0 + b_1\ OCF_{it} + e_{it} \quad \textbf{(5.52)}$$
$$MVA_{it} = b_0 + b_1 ACC_{it} + e_{it} \quad \textbf{(5.53)}$$
$$MVA_{it} = b_0 + b_1\ ATI_{it} + e_{it} \quad \textbf{(5.54)}$$
$$MVA_{it} = b_0 + b_1\ CC_{it} + e_{it} \quad \textbf{(5.55)}$$
$$MVA_{it} = b_0 + b_1\ ADJ_{it} + e_{it} \quad \textbf{(5.56)}$$

Where

MVA_{it}	= Market Value Added for firm *i* in period *t*
OCF_{it}	= Cash Flows From Operations for firm *i* in period *t*
ACC_{it}	= Accounting Accruals for firm *i* in period *t*
ATI_{it}	= After-Tax Interest Expense for firm *i* in period *t*
CC_{it}	= Cost of Capital for firm *i* in period *t*
ADJ_{it}	= Accounting Adjustments for firm *i* in period *t*
e_{it}	= random disturbance term
b_0	= constant term

Value relevance was assessed by comparing the adjusted R- square of each of the univariate regressions. Results of above univariate regressions (5.52 to 5.56) are presented in Table 5.18-A. It is clear from the Table 5.18-A that all the coefficients are found to be in the predicted direction with highly statistically significant with low $p \leq 0.000$. All the coefficients are statistically different from zero concluding all components of EVA have value relevance. Coefficients of Cash Flow From Operations (OCF) variable is highest followed by Accounting Adjustments (ADJ) and Accruals (ACC). Higher and statistical significance regression coefficients of Accounting Adjustments (ADJ) as compared to Accruals (ACC) imply that component unique to EVA (such as ADJ) has more impact on MVA as compared to ACC. Examination of adjusted R^2 statistics reveals that Cost of Capital (CC) outperform others in explaining the variations in MVA of the sample companies.

Table 5.18-B contains the results of relative information contents test (individual) of EVA components. Relative information content is measured by comparing the explanatory power of a measure. Using seminal work of Biddle *et al.*, (1995) on the issue and following the earlier work of Biddle *et al,*.1997; Chen & Dodd, 2001; Worthington & West, 2001&2004; Kim, 2006; Ismail,

2006; Maditions *et al.*, 2006 and 2009; Erasmus, 2008; Lee & Kim, 2009; ArabSalehi and Mahmoodi, 2011, adjusted R^2 of the five separate models was analyzed. The measures are arranged in decreasing sequence based on their explanatory power and results are presented in the Table 5.18-B. It is evident from the table that adjusted R^2 of different measures range from 7.87 percent to 10.57 percent. It means that none of the variables is able to explain more than 10.57 percent of variations in the market value of Indian companies during the study period. Further analysis of adjusted R^2 confirms that Cost of Capital (CC) has a significantly higher adjusted R^2 value (10.57 percent) than the other measures. It is followed by OCF (10.10%), ATI (9.39%), ADJ (8.44%) and ACC (7.87%). From the above results, it is clear that there exists a statistically significant difference in the information content of the components of EVA and null hypothesis (i.e. no difference in the information content of EVA components) is rejected in favor of alternate hypothesis. Worthington & West (2004) also revealed in their studies that CC has highest explanatory power (56.16%) in explaining the stock returns of Australian companies. It may be noticed that the adjusted R^2 values of CC and OCF are close to one another (10.57 and 10.10 percent respectively).

Component unique to EVA i.e., Cost of Capital (CC) and Accounting Adjustments (ADJ) outperforms Accruals (ACC). Also another interesting finding of the present study is that CC outperforms OCF in explaining MVA of sample companies. Finally, the results of relative information content test of the present study lead to the conclusion that components unique to EVA have value relevance more than other components. Cash Flow From Operations (OCF) ranked second followed by ATI. Although from the results of relative information content (individual) test results about Indian companies it is clear that Cost of Capital has an influence on the MVA but component unique to EVA fail to outperform in explaining the MVA of sample companies. Since Cost of Capital is also used for the calculation of Residual Income (RI) so the superiority of CC may be attributed to explanatory power of RI. Further, if the results of hypothesis II are considered, it is clear that Residual Income (RI) exhibits better explanation to changes in MVA as compared to EVA. Considering above, it can be inferred that the results of the present study do not the superiority of EVA components.

Table 5.18-A Fixed effects regression results for univariate models

Model	Constant term	Regression coefficients	R^2	Adjusted R^2	ANOVA		D-W Statistics
	b_0	b_1			F-Stat	Sign	
5.52	1.880* (27.015) 0.000	0.831* (15.791) 0.000	0.1909	0.1010	2.123	0.000	2.34
5.53	2.130* (31.044) 0.000	0.258* (5.100 0.000	0.1708	0.0787	1.854	0.000	2.33
5.54	-2.127* (-31.662) 0.000	-0.132* (-13.331) 0.000	0.1846	0.0939	2.037	0.000	2.32
5.55	-1.978* (-29.223) 0.000	-0.011* (-17.265) 0.000	0.1952	0.1057	2.182	0.000	2.33
5.56	2.115* (31.162) 0.000	0.571* (9.080) 0.000	0.1760	0.0844	1.922	0.000	2.32

Note: Figures in parentheses refer to t -values
* Estimates are statistically significant at $p \leq 0.01$

Table 5.18-B Relative value relevance test (Individual)

Rank order of R^2	CC		OCF		ATI		ADJ		ACC
R^2	10.57%	>	10.10%	>	9.39%	>	8.44%	>	7.87%

Note: Variables are arranged in the order of decreasing Adjusted R^2.

Table 5.18-C Relative value relevance test (Pair-wise)

	OCF/CC	OCF/ATI	ATI/CC	OCF/ACC	OCF/ADJ
Adjusted R^2	12.43%	11.91%	11.91%	11.61%	11.53%
	CC/ADJ	ACC/CC	ATI/ADJ	ACC/ATI	ACC/ADJ
Adjusted R^2	11.36%	10.69%	10.39%	9.84%	8.57%

In the ***Second step***, a set of tests was conducted to examine which of the five predictors of shareholder value (components of EVA) provides value-relevance greater than that provided by other measures. To achieve this, each of the five independent variables was paired alternatively with each other in a multivariate regression.

5.5.3.1.1 Value relevance of Cash Flow From Operations (OCF) over other measures

The value-relevance of OCF over various performance measures was examined using following pair wise multivariate regressions:

$$MVA_{it} = b_0+b_1OCF_{it} + b_2ADJ_{it} + e_{it} \qquad \textbf{(5.57)}$$
$$MVA_{it} = b_0+b_1OCF_{it} + b_2CC_{it} + e_{it} \qquad \textbf{(5.58)}$$
$$MVA_{it} = b_0+b_1OCF_{it} + b_2ATI_{it} + e_{it} \qquad \textbf{(5.59)}$$
$$MVA_{it} = b_0+b_1 OCF_{it} + b_2 ACC_{it} + e_{it} \qquad \textbf{(5.60)}$$

Where;

MVA_{it}	= Market Value Added for firm *i* in period *t*
OCF_{it}	= Cash Flows From Operations for firm *i* in period *t*
ACC_{it}	= Accounting Accruals for firm *i* in period *t*
ATI_{it}	= After-Tax Interest Expense for firm *i* in period *t*
CC_{it}	= Cost of Capital for firm *i* in period *t*
ADJ_{it}	= Accounting Adjustment for firm *i* in period *t*
e_{it}	= random disturbance term
b_0	= constant term

The pair wise fixed effects panel data regression results of above models are summarized in Table 5.19. It is clear from the table that regression coefficients of all the models are statistically significant. Examination of R^2 and adjusted R^2 reveals that out of four alternative pairs of EVA components, combination of Cash Flow From Operations (OCF) and Cost of Capital (CC) has highest R^2 and Adjusted R^2 of 21.20 percent and 12.43 percent respectively. This is followed by combination of OCF and ATI with a value 20.39 percent and 11.91 percent respectively for R^2 and adjusted R^2. Also combination OCF and ADJ has not only lowest R^2 and adjusted R^2 (20.39% and 11.53% respectively) values but also not statistically significant. ANOVA results also confirms that all the models are statistically significant (p-value <0.000) and pairwise combination of EVA components have significant value relevance in explaining the MVA. Overall results suggest that out of the above pairwise regressions, combination of OCF and CC represents the most satisfactory explanation for MVA.

Table 5.19 Fixed effects regressions results for value relevance of OCF over other variables

Model	Constant term	Regression coefficients		R^2	Adjusted R^2	ANOVA		D-W Statistics
	b_0	b_1	b_2			F-Stat	Sign	
5.57	1.739* (24.833) 0.000	0.938* (17.712) 0.000	0.757* (12.070) 0.000	0.2038	0.1153	2.302	0.000	2.34
5.58	1.729* (24.923) 0.000	0.725* (13.838) 0.000	-0.010* (-15.490) 0.000	0.2120	0.1243	6.575	0.000	2.34
5.59	1.814* (26.263) 0.000	0.834* (16.025) 0.000	-0.133* (-13.606) 0.000	0.2073	0.1191	2.351	0.000	2.33
5.60	1.801* (25.990) 0.000	1.686* (19.506) 0.000	1.019* (12.410) 0.000	0.2046	0.1161	2.312	0.000	2.34

Note: Figures in parentheses refer to t - values
* Estimates are statistically significant at $p \leq 0.01$

5.5.3.1.2 Value relevance of Accruals (ACC) over other measures

The value-relevance of Accruals over various performance measures has been examined using following pair wise multivariate regressions:

$$MVA_{it} = b_0 + b_1 ACC_{it} + b_2 ADJ_{it} + e_{it} \quad \textbf{(5.61)}$$
$$MVA_{it} = b_0 + b_1 ACC_{it} + b_2 CC_{it} + e_{it} \quad \textbf{(5.62)}$$
$$MVA_{it} = b_0 + b_1 ACC_{it} + b_2 ATI_{it} + e_{it} \quad \textbf{(5.63)}$$

Where

MVA_{it} = Market Value Added for firm i in period t
ACC_{it} = Accounting Accruals for firm i in period t
ADJ_{it} = Accounting Adjustment for firm i in period t
ATI_{it} = After-Tax Interest Expense for firm i in period t
CC_{it} = Cost of Capital for firm i in period t
e_{it} = random disturbance term
b_0 = constant term

Using fixed effects panel data regression, the above models was examined to know which combination of above regression outperforms in explaining the MVA of the companies. Results of above fixed effects panel data regression models are presented in Table 5.20. It depicts that all the regression coefficients are found to be statistically significant indicating that all these are reliable predictor of shareholders wealth of Indian companies during study period. Comparison of coefficients further reveals that Accruals and Accounting Adjustments have maximum influence on MVA with a positive coefficient value of 0.175 and 0.528 respectively for ACC and ADJ.

Table 5.20 Fixed effects regressions results for value relevance of ACC over other variables

Model	Constant term	Regression coefficients		R^2	Adjusted R^2	ANOVA		D-W Statistics
	b_0	b_1	b_2			F-Stat	Sign	
5.61	2.079* (30.290) 0.000	0.175* (3.411) 0.000	0.528* (8.244) 0.000	0.1770	0.095	1.934	0.000	2.33
5.62	-1.941* (-28.330) 0.000	0.177* (3.553) 0.000	-0.011* (-16.860) 0.000	0.1963	0.1069	2.196	0.000	2.33
5.63	-2.043* (-29.973) 0.000	0.338* (6.709) 0.000	-0.140* (-14.036) 0.000	0.1886	0.088	2.090	0.000	2.32

Note: Figures in parentheses refer to *t* -values
* Estimates are statistically significant at $p \leq 0.01$

Analysis of Adjusted R^2 concludes that Accruals when paired with Cost of Capital (CC) contribute maximum to the explanatory power of MVA. F-statistics also support the same. Positive coefficient of ADJ reveals that it has positive influence on the MVA as advocated by EVA proponents. Combination of ACC and ADJ follow ACC and CC in explaining the MVA of sample companies. Finally the results conclude that ACC and CC is the most appropriate pair in explaining in MVA of Indian companies.

5.5.3.1.3 Value relevance of After Tax Interest (ATI) over other measures

Similar to above steps, value relevance of ATI over other measures is examined using following multivariate regression models:

$$MVA_{it} = b_0 + b_1 ATI_{it} + b_2 ADJ_{it} + e_{it} \quad \textbf{(5.64)}$$

$$MVA_{it} = b_0 + b_1 ATI_{it} + b_2 CC_{it} + e_{it} \quad \textbf{(5.65)}$$

Where
MVA_{it} = Market Value Added for firm *i* in period *t*
ADJ_{it} = Accounting Adjustment for firm *i* in period *t*
ATI_{it} = After-Tax Interest Expense for firm *i* in period *t*
CC_{it} = Cost of Capital for firm *i* in period *t*
e_{it} = random disturbance term
b_0 = constant term

Tables 5.27 present the result of above regressions and suggest that all the regression coefficients are significant at $p \leq 0.01$. Closer examination of coefficients reveals that ATI and CC are negatively associated with MVA, whereas ADJ is positively associated with Market Value Added of Indian companies. With an adjusted R^2 (11.91 percent), combination of After Tax Interest (ATI) and Cost of Capital (CC) contribute maximum to the variation in the MVA.

Although the combination of ATI and ADJ is also statistically significant, it significantly smaller than ATI and CC (F= 2.351 and 2.159 respectively). The Overall results of regressions conclude that ATI and CC is most appropriate combination in explaining the changes in MVA of Indian companies.

Table 5.21 Fixed effects regressions results for value relevance of ATI over other variables

Model	Constant term	Regression coefficients		R^2	Adjusted R^2	ANOVA		D-W Statistics
	b_0	b_1	b_2			F-Stat	Sign	
5.64	-2.040* (-30.289) 0.000	-0.139* (-14.009) 0.000	0.626* (10.040) 0.000	0.1936	0.1039	2.159	0.000	2.32
5.65	-1.938* (-28.799) 0.000	-0.115* (-11.728) 0.000	-0.010* (-16.043) 0.000	0.2073	0.1191	2.351	0.000	2.32

Note: Figures in parentheses refer to t -values
* Estimates are statistically significant at $p \leq 0.01$

5.5.3.1.4 Value relevance of Cost of Capital (CC) over ADJ

In order to analyze the value relevance of Cost of Capital (CC) over Accounting Adjustments (ADJ) following regression model is examined:

$$MVA_{it} = b_0+b_1CC_{it} + b_2ADJ_{it+} e_{it} \qquad \textbf{(5.66)}$$

Where

MVA_{it} = Market Value Added for firm i in period t
ADJ_{it} = Accounting Adjustment for firm i in period t
CC_{it} = Cost of Capital for firm i in period t
e_{it} = random disturbance term
b_0 = constant term

At last, pair wise combination of CC and ADJ was examined using fixed effects panel regression model and results are summarized in Table 5.22. It depicts that coefficients of Cost of Capital (CC) and Accounting Adjustments (ADJ) are negatively & positively associated with MVA as claimed by proponents of EVA. Additionally, the coefficient of ADJ is positive and largest with highly statistical significance. ADJ when paired with CC, explain 11.36 percent variation in MVA of the sample companies as evident from Adjusted R^2 statistics.

Table 5.22 Fixed effects regressions results for value relevance of CC over ADJ

Model	Constant term	Regression coefficients		R^2	Adjusted R^2	ANOVA		D-W Statistics
	b_0	b_1	b_2			F-Stat	Sign	
5.66	-1.906 (-28.076) 0.000	-0.011 (-17.202) 0.000	0.555 (8.962) 0.000	0.2023	0.1136	2.280	0.000	2.33

Note: Figures in parentheses refer to *t*- values
* Estimates are statistically significant at $p \leq 0.01$

5.5.3.2 Incremental Information Content Test

After analyzing the pair-wise combination of regressions, incremental value relevance of performance measures is determined by taking the R- squares from pair wise regressions. Subtracting the individual R-square obtained in the first step (univariate regressions) yields the value-relevance of the above pair-wise regressions. For example, taking the R-square from regression equation (5.57), and subtracting the individual R-square for ADJ obtained in the univariate regression (5.56) gives the incremental value relevance of OCF over ADJ. Again taking the R-square from regression equation (5.58), and subtracting the individual R-square for CC obtained in the univariate regression (5.55) gives the incremental value relevance of OCF over CC and similarly for other pair wise regressions.

Table 5.23 displays the results of incremental information content tests for the OCF, CC, ATI, ACC and ADJ. For example, in Table 5.23, OCF/ADJ (3.66 percent) is equal to the relative information content of pair wise comparison of OCF and ADJ (11.53 percent) as given in Table 5.18-C minus the relative information content(univariate) of ADJ (8.44 percent) from Table 5.18-B. The pair wise combination of OCF, CC, ATI, ACC and ADJ indicates that OCF when combined with ADJ represents the most satisfactory explanation for the Market Value Added (MVA) in the Indian market. Worthington & West (2004) also revealed similar results. The pair wise combinations that most explain MVA, in order of decreasing explanatory power, are OCF/ADJ(3.66%),CC/ADJ(3.49%),OCF/ACC(3.17%),ATI/ADJ(2.52%),OCF/ATI(2.52%),CC/ATI(2.52%),CC/OCF(2.33%), CC/ACC(2.25%), OCF/CC(1.86%), ATI/OCF(1.81%), ACC/OCF(1.51%), ADJ/OCF(1.43%), ATI/ACC(1.40%), ATI/CC(1.34%), ADJ/ATI(1.00%), ADJ/CC(0.79%), ACC/ADJ(0.70%),ACC/ATI(0.45%), ADJ/ACC(0.13%) and ACC/CC(0.12%).

Overall, the components of EVA that explains most changes in MVA are Accounting Adjustments (ADJ), followed by After -Tax Interest (ATI), Cash Flow From Operations (OCF), Accounting Accruals (ACC) and Cost of Capital (CC). These results of incremental information content test suggest that component unique to EVA i.e. ADJ has marginal incremental value relevance only when it is combined with traditional measures. EVA unique component is unable to outperform earnings in relative information test thereby rejecting that components unique to EVA has greater value relevance than earnings in explaining shareholder wealth (as measured by MVA).Thus, results of present study about Indian companies do not fully support the Stern Stewart claim about its superiority over earnings.

Table 5.23 Incremental value relevance test – EVA components

	OCF/ADJ	**CC/ADJ**	**OCF/ACC**	**ATI/ADJ**	**OCF/ATI**	**CC/ATI**	**CC/OCF**
Adj. R^2	3.66%	3.49%	3.17%	2.52%	2.52%	2.52%	2.33%
	CC/ACC	OCF/CC	ATI/OCF	ACC/OCF	ADJ/OCF	ATI/ACC	ATI/CC
Adj. R^2	2.25%	1.86%	1.81%	1.51%	1.43%	1.40%	1.34%
	ADJ/ATI	ADJ/CC	ACC/ADJ	ACC/ATI	ADJ/ACC	ACC/CC	
Adj. R^2	1.00%	0.79%	0.70%	0.45%	0.13%	0.12%	

Note: Pair wise regressions are arranged in order of decreasing adjusted R^2.

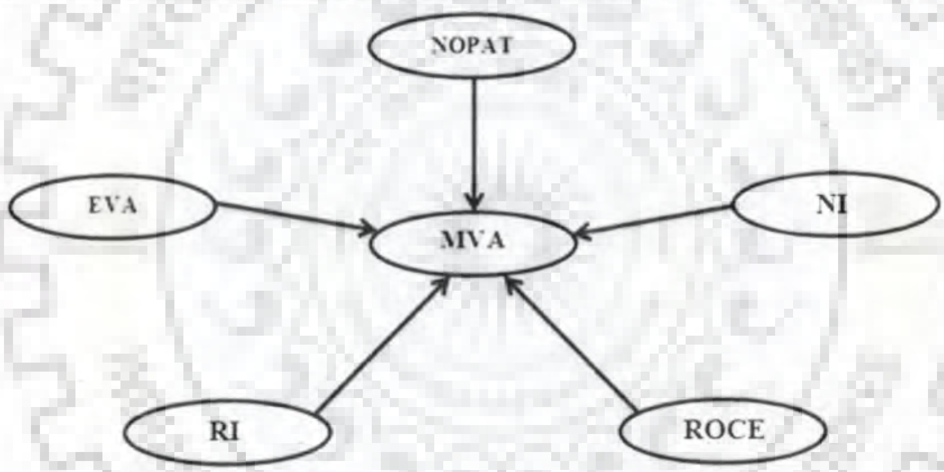
5.6 Conclusion

Chapters 5 combine the research findings and analysis and present the results of panel data regression analysis which results in significant conclusions. A detailed critical discussion of panel data regression results have been presented by comparing them with important studies presented in the literature review. Using a sample of 996 non-financial Indian firms for a period of 2000-2009, this study found the efficacy of value based and traditional corporate financial performance measures and its relationship with MVA. The following points summarize the findings.

- There exists a positive relationship between EVA and MVA of Indian companies in which value based measure such as EVA has statistically significant influence on the shareholder value. Additionally, EVA is a useful measure of corporate performance as it has positive association with MVA when used in univariate regression. While the results of relationship between EVA and MVA are significant, much of the variation of MVA remains unexplained. So, in order to obtain more insight into the strength of EVA as proxy for MVA, relationship between NOPAT and MVA was examined and result indicates that MVA is positively related to both EVA and NOPAT in the same periods (Table 5.6 A& B). However, EVA explains slightly more of the total variation in MVA (Adjusted R^2= 18.18%) than NOPAT (Adjusted R^2= 11.10%) does. F-statistics revealed the statistical significance (with $p < 0.001$) of the model. The overall results of the above model conclude that the level of EVA is not only a better proxy but is also better predicator of Market Value Added (MVA) than the level of Net Operating Profit After Tax (NOPAT).

- Value relevance of all performance measures was examined using multivariate regression model, where MVA was specified as dependent variable and EVA, NOPAT, EPS, NI, RI, OCF, RONW and ROCE was specified as independent variables. Results as presented in Table 5.7 shows the estimated coefficients, *t*- statistics, *R*- square, Adjusted *R*- square and ANOVA results of the multivariate pooled regression model (5.14). It is clear from the results of fixed effects panel regressions that all the financial performance metrics (EVA, NOPAT, ROCE, RONW, EPS, NI, RI and OCF) are found to be positively associated with the changes in shareholder's value (MVA) of sample Indian companies.

Figure 5.5 Final determinants of MVA of Indian companies at aggregate level



- Although RONW and OCF results are positively correlated with MVA but not statistically significant. Examination of R- square and Adjusted R- square statistics reveals that approximately 41% and 33% of the changes in the Market Value Added (MVA) of Indian companies can be explained by all the explanatory variables together. As summarized in Table 5.7, the results of multivariate regression, first, provided strong evidence of the significance and direction of the relationships as previously hypothesized. Secondly, the results have established a baseline to analyze the relative and incremental value relevance of EVA. Further on the basis of results of multivariate regression results and as given in figure 5.5, it is clear that NOPAT, EVA, RI, NI and ROCE can be considered as final determinants of changes in MVA of Indian companies during 2000-2009.

- The Relative and incremental information content tests were performed determine the value relevance of various measures. Relative information content was analyzed using two step methodology similar to used by Elali (2006). In the first step, univariate regression was analyzed and explanatory power (adjusted R^2) of different measures was compared in order to know which measure outperform others. Another objective was to know whether value based or traditional measures are superior in explaining MVA of Indian companies. Table 5.8-B contains the results of relative information contents test. Relative information content is measured by comparing the explanatory power of a measure. Using seminal work of Biddle *et al.* (1995) on the issue and following the earlier work of Jennings, 1990; Biddle *et al.*, 1995& 1997; Lehn & Makhija, 1996; Bao & Bao, 1998; Chen & Dodd, 2001; Jalili, 2002; Worthington & West, 2001 and 2004; Feltham *et al.*, 2004; Elali, 2006; Ismail, 2006; Kim, 2006; Erasmus, 2007; Visaltanachoti *et al.*, 2008; Kim & Lee, 2009; and ArabSalehi and Mahmoodi, 2011, adjusted R^2 of the eight separate models was analyzed. The measures are arranged in decreasing sequence based on their adjusted R^2 values and are presented in the Table 5.8-B. From the analysis of Adjusted R^2, it is clear that EPS has a significantly higher Adjusted R^2 value (21.89 percent) than the other measures. It is followed by RI (19.12%), EVA (18.18%), NOPAT (11.10%), OCF (10.10%), RONW (7.66%), ROCE (7.63%) and NI (7.60%). It is clear that there exists a statistically significant difference in the information content of the various performance measures and null hypothesis (i.e., no difference in the information content of various measures) is rejected in favor of alternate hypothesis. A point worth nothing here is that the adjusted R^2 values of RI and EVA are close to one another (19.12 and 18.18 percent respectively) and also although EVA significantly outperform NOPAT, OCF, RONW, ROCE and NI but underperform EPS and RI. Also another interesting finding of the present study is that explanatory power of NOPAT (Net Operating Profit After Tax) is better than that of NI.
- Most of the findings of the present study about relative information content test are found to be consistent with those advanced by Biddle *et al.* (1997). Biddle *et al.*, 1997 reported that EBEI (Earnings Before Extraordinary Income) was associated more with stock return than either of RI and EVA. Similarly research studies by Chen & Dodd, 2001; Worthington & West, 2001, 2004; Ismail, 2006 reported that mandated corporate financial performance measures outperformed RI and EVA. De Villiers and Auret (1998) revealed that EPS outperforms EVA. They concluded that EVA does not offer any advantage over

the traditional measures. Erasmus (2007) in his study about value based and conventional performance measures conclude that EBEI outperform EVA. Interestingly, the result about Residual Income (RI) in the present study is very much consistent (RI is second best in explaining the changes in MVA) with those of Erasums (2007) and Visaltanachoti *et al.*, (2008). The other studies by various researchers like Clinton & Chen (1998), Ray (2001), Kim (2006), Dodd and Chen (1996), Ferguson and Leistikow(1998), Kramer and Pushner(1997) also concluded that mandated traditional performance measures outperforms EVA and RI in explaining market value of firms. Finally the results of the relative test of the study lead to the conclusion that although EVA is important but it does not significantly outperform EPS. Residual Income (RI), also referred to as Economic Profit- another variant of value based financial performance measure ranked second followed by EVA. Statistically there is very less difference in explanatory power of RI and EVA. Therefore, relative information content tests results about Indian companies refute the claim that EVA is by far the best financial performance measure that explains the changes in the market value.

- In the second step, a set of tests was conducted to know which of the eight predictors of shareholder value provides value-relevance beyond that provided by other measures. In these tests, each of the eight independent variables was paired alternatively with each other in a multivariate regression. The pair wise R^2 of all the fixed effects regression models (5.22 to 5.50) are summarized in the Table 5.16-A. One interesting and important observation from pairwise regression is that as EPS best explain MVA in four out of top five pairwise regressions and there is already an indication that it is a highly significant explanatory factor. Coefficients of determination (R^2) of pair wise regression of five combination that most explains MVA is EPS/NOPAT (26.54%), EPS/RI (25.97%), EVA/EPS (25.69%), EPS/OCF (25.055) and EPS/RONW (23.42%). The results of relative information content of pair wise regression conclude that combination of EPS and NOPAT outperform other measures in explaining the MVA of sample companies.
- After analyzing the pair wise combination of regressions, incremental value relevance of performance measures was examined by taking the R- squares from pair wise regressions. Subtracting the individual R-squared obtained in the first step (univariate regressions) yields the value-relevance of the above mentioned pair wise regressions. For example, taking the R-square from regression equation (5.23), and subtracting the individual R-

square for RI obtained in the univariate regression (5.22), gives the incremental value-relevance of EVA over RI and similarly for other pair wise regressions. Table 5.16-B displays the results of incremental information content tests for the EVA, EPS, NI, NOPAT, ROCE, RONW, RI and OCF. The pair wise combination o indicates that EPS when combined with traditional measures such as NI, ROCE, RONW, NOPAT and OCF, it represents the most satisfactory explanation for the Market Value Added (MVA) in the Indian market. Worthington & West (2004); Chen and Dodd (2001) and Maditions *et al.*, (2009) also revealed similar results.

- Overall, the results of hypothesis II indicate that EPS exhibits the largest(16 percent) incremental information content among the measures, with EVA (3.80 percent), RI (-2.77 percent), NOPAT (-10.79 percent), RONW (-14.23 percent), NI (- 14.29 percent) and ROCE (-14.29 percent) providing only limited incremental information content beyond earnings. The most logical pairing of information variables in explaining market value is therefore composed of EPS and NI. Traditional measures outperform value based measures in providing incremental information content. Thus, results of present study fail to support the Stern Stewart claim that EVA has greater information than earnings. In contrast, the evidence points to Earnings Per Share (EPS) having higher incremental information content than EVA.
- To achieve the third objective about whether components unique to EVA can help to explain contemporaneous MVA beyond that explained by other measures, similar to an approach used to achieve second objective of the study. Hypothesis III analyses whether components unique to EVA have greater information and usefulness over other components. Following Biddle *et al.*, 1997; Bao & Bao, 1998; Chen & Dodd, 2001; Worthington and West, 2001, 2004); Elali, 2006; Ismail, 2006; Kyriazis and Anastassis, 2007; and Erasmus, 2008, the present study disintegrate the components of EVA into five parts. The rational for disintegrating EVA is to examine whether "aggregate" EVA make much of the usefulness of its individual components, and whether the disintegration of EVA improves the degree of association with MVA. This part of analysis addresses the empirical question of what components of EVA contributes most to variation in MVA.
- Table 5.17 summarizes the results of multivariate regression using fixed effects panel regression models. It is evident from the table that the all the regression coefficients are statistically significant with a high t-statistics showing all the variable has strong

relationship with MVA. Cash Flow From Operations (OCF) is positively associated with MVA having highest regression coefficient (2.684468) which reveals that it has maximum influence on the MVA. OCF, ACC and ADJ are found to be positively associated with MVA, whereas ATI and CC are found to be negatively correlated with MVA as hypothesized. Results of all the coefficients are consistent with the earlier studies of Biddle *et al.*, 1997; Ismail, 2006; Visaltanachoti *et al.*, 2008; Erasmus, 2008. Adjusted R^2 (a measure of coefficient of determination) value of 0. 1942 conclude that 19.42% of the variation in the MVA is revealed by components model (EVA components). Statistical significance of the EVA component model with *F-value* of 3.401(low p-value 0.000) provide a baseline for analyzing the incremental value-relevance of EVA components.

- Again, following value- relevance methodology as used in hypothesis II, hypothesis III was tested using a two step process. First, relative value relevance of each of the components of EVA such as OCF, ADJ, ACC, CC and ATI was evaluated using univariate regressions. Secondly, pair wise regression analysis was performed to know the incremental value relevance of EVA components.
- Table 5.18-B contains the results of relative information contents test (individual) of EVA components. The measures are arranged in decreasing sequence based on their Adjusted R^2 values. It is evident from the table that Adjusted R^2 of different measures ranges 7.87 percent to 10.57 percent. It means that none of the variables is able to explain more than 10.57 percent of variations in the market value. From the analysis of adjusted R^2, it is clear that the Cost of Capital (CC) has a significantly higher Adjusted R^2 value (10.57 percent) than the other measures. It is followed by OCF (10.10%), ATI (9.39%), ADJ (8.44%) and ACC (7.87%). From the above findings, it is clear that there exists a statistically significant difference in the information content of the components of EVA. Null hypothesis of no difference in the information content of EVA components is rejected in favor of alternate hypothesis. Worthington & West (2004) also revealed that CC has highest explanatory power (56.16%) in explaining the stock returns of Australian companies. A point worth noting here is that that the Adjusted R^2 values of CC and OCF are close to one another (10.57 and 10.10 percent respectively). Cash Flow From Operations (OCF) ranked second followed by ATI. Although from the results of relative information content (individual) test results about Indian companies it is clear that Cost of Capital has an influence on the MVA but component unique to EVA fail to outperform in

explaining the MVA of sample companies. The Cost of Capital is used for the calculation of Residual Income (RI) so the superiority of CC may be attributed to explanatory power of RI. Further, if the results of hypothesis II are considered, it is clear that Residual Income (RI) exhibits better explanation to changes in MVA as compared to EVA. Considering above, it can be inferred that the results of the present study do not the superiority of EVA components.

- The pair wise combination of OCF, CC, ATI, ACC and ADJ indicates that OCF when combined with ADJ represents the most satisfactory explanation for the Market Value Added (MVA) in the Indian market. Overall, the components of EVA that explains most changes in MVA are Accounting Adjustments (ADJ), followed by After-Tax Interest (ATI), Cash Flow From Operations (OCF), Accounting Accruals (ACC) and Cost of Capital (CC). These results of incremental information content test suggest that component unique to EVA i.e. ADJ has marginal incremental value relevance only when it is combined with traditional measures. EVA unique component is unable to outperform earnings in relative information test thereby rejecting that components unique to EVA has greater value relevance than earnings in explaining shareholder wealth (as measured by MVA).Thus, results of present study about Indian companies do not fully support the Stern Stewart claim about its superiority over earnings.

Notes

1. Researcher likes Biddle *et al.*, 1997; Chen & Dodd, 2001; Elali, 2006; Kim, 2006 and Lee & Kim, 2009 have used the similar variable.
2. Since the only difference between EVA and NOPAT is the Cost of Capital (COC), results favoring NOPAT may be attributable to misestimating by Stern Stewart of the cost of capital (potentially from using a CAPM approach to estimate the cost of equity). See for example, Kramer and Pushner, 1997; Zafiris and Bayldon, 1999; Elali, 2006; Ismail, 2006; Kim, 2006.
3. Also known as information usefulness or content.
4. The test statistic is asymptotically distributed as Chi-Squared and the test is based on the Wald criterion (Greene, 1993, p. 480). The null hypothesis underlying the Hausman test is that the fixed and random specifications are consistent, whereas under the alternative, the fixed effects model is, but the random effects model is not.
5. Adjusted R-Square value is an attempt to correct the shortcoming of R- square by adjusting both the numerator and the denominator by their respective degrees of freedom.
6. *See* Biddle *et al.*, (1995)

CHAPTER 6

DATA ANALYSIS & RESULT PRESENTATION – II (CROSS-INDUSTRY ANALYSIS OF PERORMANCE MEASURES)

CHAPTER 6
DATA ANALYSIS AND RESULT PRESENTATION – II
(CROSS-INDUSTRY ANALYSIS OF PERFORMANCE MEASURES)

Preview

The present chapter is based on cross-industry analysis of Economic Value Added (EVA) and conventional performances measures in explaining the MVA of the sample companies during the study period. Using disaggregate approach, the main objective was to examine the determinants of MVA across different sample industries. Also another objective was to find out the efficacy of value based and conventional measures across industries. It was found from the analysis that. Results of correlation analysis indicates that in majority of industries Net Operating Profit After Tax (NOPAT), Net Income (NI) and Cash Flow From Operations (OCF) are highly correlated with Market Value Added (MVA). Economic Value Added (EVA) although positively associated with MVA in all industries outperform ROCE, RONW, EPS in 18 sectors out of 23 but underperform NI, NOPAT and OCF in majority of the cases. It leads to conclusion that traditional performance measures are better associated with MVA in the sample industries. Net Income (NI), Net Operating Profit After Tax (NOPAT), Cash Flow From Operations (OCF), Earnings Per Share (EPS) and even Residual Income (RI) in some industries outperform EVA in explaining the changes in MVA in majority of the industries during the study period. Further, Return On Capital Employed (ROCE) and Return on Net worth (RONW) have insignificant association with MVA in 18 and 20 industries respectively implying that both of these cannot be regarded as predictor of MVA in sample industries. Comparative ranking based on relative information content test suggest that Net income (NI), Net Operating Profit After Tax(NOPAT) and Cash Flow From Operations (OCF) are the top three measures that dominates in the sample industries in explaining the changes in the MVA. Net income (NI) has been ranked First in 11 industries as compared to NOPAT in 07 industries. Net Operating Profit After Tax (NOPAT) mandated corporate performance measures occupies second place as it has been placed Second in 12 industries and finally Cash Flow From Operations(OCF) is at Third place with 12 industries reporting it as important measures in explaining MVA during the study period. Results of disaggregate approach used in this chapter are similar to aggregate approach used in last chapter and overall results refute the claim of EVA superiority in explaining the MVA as compared to traditional measures during the study period.

6.1 INTRODUCTION

This chapter analyses the performance measures efficacy at disaggregate level. After analyzing the efficacy of various performance measures at aggregate level and their value relevance in the last chapter, industry wise analysis was performed. Using disaggregate approach, the whole data set is divided into different sectors as per the nature of underlying business activities. The companies are categorized on the basis of their economic activities. For this purpose, economic activities are considered as defined by Prowess database. Twenty Three (23) such sectors and industries are formed out of 996 firms. The rationale behind using disaggregate approach is twofold: (i) *to know the behavior of various performance measures in explaining the MVA across different sectors* and (ii) *to examine the differences in the performance of various measures in different sectors in explaining the MVA and analyze which performance measure outperform in industry specific cases and in general*. The empirical work on efficacy of various performance measures till date has analyzed these measures at an aggregate level only and none or very little[1] empirical evidence is available about industry wise behavior of value based and traditional performance measures in explaining the contemporaneous MVA.

6.2 METHODOLOGY

The main objective of industry wise analysis of various performance measures is to know how different performance measures behave in explaining the contemporaneous MVA in different industries. Along with this, following are other objectives of the present analysis:

1. To rank the different performance measures across industries.
2. To know which performance measure outperforms in explaining the MVA in different industries.
3. To examine the difference in the ranking of different performance measures in different industries.
4. To suggest which performance measures are reliable guide to MVA in different industries.

As a first step, descriptive statistics and correlation statistics of different industries are examined. Then in order to know the determinants of contemporaneous MVA, multivariate regression analysis and ANOVA is performed for each industry and results are examined. This is followed by univariate regression analysis and ranking of different performance measures in order to know the behavior of various performance measures to find out which performance measure outperforms MVA in explaining different industries.

6.3 DESCRIPTIVE STATISTICS – INDUSTRY WISE

Table 6.1 shows the composition of 996 companies according to their industries. Sample was drawn from 23 industries. It is clear from the table that the sample companies are from diverse industries and they cover all important sector of the economy. As explained earlier in the chapter IV, the sample companies are mainly listed non- financial firms covering a period of 2000-2009.

Table 6.1 Industry wise distribution of sample companies

Sector	Number of Companies	% age of Total companies
Agriculture Products	47	4.72
Automobile & Ancillary	67	6.73
Business Consultancy	09	0.90
Cement	23	2.31
Chemical	67	6.73
Computer and IT	97	9.74
Construction	38	3.82
Diversified	12	1.20
Electronics	55	5.52
FMCG	10	1.00
Footwear	8	0.80
Gems & Jewellery	17	1.71
Hotels & Restaurant	17	1.71
Machinery & Machinery Tools	46	4.62
Metal and Metal Products	28	2.81
Miscellaneous	68	6.83
Paper& Paper Products	23	2.31
Pharmaceutical	83	8.33
Plastic	68	6.83
Power Generation	32	3.21
Textile	111	11.14
Trading	56	5.62
Transport Services	14	1.41
Total	**996**	100.00

Note: Miscellaneous includes companies covering Refinery, Tobacco products, Aluminum, Bear and alcohol, Dairy product, Crude oil and natural gases, Retail trading, Refectories, Heath services, Floriculture, Glass & glassware, Lubricants, Dry cells, Other storage & distribution, LNG storage & distribution, Cocoa products & confectionery, Ceramic products, Books & cards, Air-conditioners & refrigerators and Miscellaneous activities.

Descriptive statistics covering mean, maximum, minimum and standard deviation (S.D) of all industries are presented in the Table 6.2. Mean statistics of Market Value Added (MVA) as presented reveals that industries, except companies operating in Chemical and Chemical products and Textile sector, have created value for its shareholders. Only textile, chemical and chemical products industries have negative MVA value, implying that they have destroyed value of shareholders during the period of the study. Analysis of industry wise mean value of MVA further reveals that FMCG has the largest (Rs.5063.23 crore) value creator, followed by companies operating in miscellaneous, computer and IT, construction and power sector with mean MVA value of Rs 1754.32, 1388.75, Rs 905.01 and Rs 638.64 crore respectively. Whereas, textile has lowest mean MVA (-97.8 crore) followed by chemical and plastic sector with mean MVA of Rs. -4.91 crore and Rs. 2.51 crore respectively. Industry wise average EVA figures as presented in the Table 6.2 display that out of 23 sectors, FMCG, footwear, chemical and chemical products and construction are not able to earn more than the Cost of Capital, implying decrease in the value for the shareholders. Among the value creators, trading, power generation, miscellaneous, cement and transport are at the top when compared with other industries with positive EVA figures of Rs. 18982 crore, Rs. 10980.01 crore, Rs. 10719.39 crore, Rs.6477.83 and Rs. 4551.63 crore respectively.

An important observation about average Earnings Per Share (EPS) as evident from Table 6.2 shows that all industries have positive EPS values. Highest EPS figure (Rs. 16.65) of construction industry reveals that companies operating in construction sector outperform others. It is followed by machinery, power generation, metal & metal products and FMCG with EPS figures of Rs. 15.15, Rs.14.65, Rs.12.99 and Rs. 12.35 respectively. Lowest value can be seen in case of plastic, textile, trading and electronics with Rs. 1.97, Rs.3.29, Rs.3.56 and Rs. 3.89 respectively. Return On Capital Employed (ROCE) which is an important measure of financial performance from sample companies reveals that sectors like textile, miscellaneous and paper industries have negative return on the capital employed during the 2000-2009. On the other hand, companies operating in construction, gems and jewelry, FMCG, plastic and power generation are few top industries having positive Return On Capital Employed. Similar to EPS, companies in construction industry sector have highest ROCE (71 percent). Gems and jewelry sector and FMCG sector follow construction industry with average ROCE figures of 40.78 percent and 23.34 percent respectively.

Analysis of Return On Net Worth (RONW), another measure for financial performance reveals that electronics, FMCG, construction, gems and jewelry and power generation are top industries that reported positive RONW during the study period, whereas, paper(-22.87 percent) and cement (-10.13 percent) reported negative RONW figures. Electronics with a RONW figure of 33.50 percent outperform FMCG (21.22percent) and construction (21.22 percent). Gems and jewelry (13.05 percent) and power generation (10.81 percent) sectors follow electronics, FMCG and construction sector. Average figures of Net Income (NI) and Net Operating Profit After Tax (NOPAT) reveal the similar results. Companies in miscellaneous sectors have highest values for both these measures. FMCG, power generation, transportation and cement industries are among top after miscellaneous sectors. With average NOPAT figures of Rs 4.52 crore and Rs 6.83 crore, plastic and cement industries are at the end. In case of Net Income (NI), trading and footwear sectors reported lowest figures of Rs 7.38 crore and Rs 10.1 crore respectively.

Table 6.2 Descriptive statistics for all industries

Industries	Statistics	Variables								
		MVA	EVA	EPS	ROCE	RONW	NI	OCF	NOPAT	RI
Agriculture Products	*Minimum*	-963.98	-15413.68	-40.38	-405.83	-754.95	-59.79	-820.81	-21.28	-13518.02
	Maximum	14634.63	19285.00	110.48	233.38	200.97	691.96	681.55	558.23	19319.07
	Mean	**232.98**	**674.67**	**7.88**	**7.52**	**7.47**	**21.78**	**19.21**	**24.77**	**667.85**
	S.D	1297.08	1903.14	17.57	33.30	53.52	61.93	100.23	58.12	1876.33
Automobile and automobile parts	*Minimum*	-4694.39	-179412	-84.58	-685.71	-8476.92	-500.34	-499.35	-121.54	-179117
	Maximum	23328.25	1570.44	987.26	65.43	305.49	2028.92	6078.94	1720.82	1515.67
	Mean	**233.11**	**668.94**	**7.64**	**7.32**	**7.28**	**21.18**	**19.00**	**24.29**	**662.26**
	S.D	1290.58	1895.16	17.35	32.74	52.61	60.95	99.67	57.19	1868.44
Business Consultancy	*Minimum*	-404.19	-5767.18	-7.28	-45.30	-46.55	-11.21	-50.36	-1.55	-5813.64
	Maximum	2187.66	2991.12	200.84	44.77	46.55	137.38	134.11	125.18	3000.73
	Mean	**47.10**	**503.56**	**10.26**	**4.31**	**6.67**	**9.40**	**14.68**	**11.04**	**513.29**
	S.D	342.41	1195.67	26.70	14.01	17.93	22.96	28.73	22.03	1206.26
	N									
Cement	*Minimum*	-1536.29	-186415.14	-404.23	-286.13	-3489.57	-201.37	-98.93	-51.23	-186443.24
	Maximum	14858.02	16769.95	343.02	141.89	359.21	1769.10	1723.21	1558.52	16660.84
	Mean	**408.76**	**6477.83**	**9.69**	**1.80**	**-10.13**	**97.20**	**158.44**	**109.36**	**6591.90**
	S.D	2210.69	18610.82	69.00	39.02	255.75	270.98	287.57	228.64	18634.76
Chemical and chemical products	*Minimum*	-1171.74	-14056.35	-510.70	-301.48	-1344.68	-114.71	-154.40	-201.35	-14223.44
	Maximum	5936.67	14613.22	1008.35	194.94	1320.00	376.44	348.31	317.18	14456.94
	Mean	**-4.97**	**-768.62**	**7.52**	**3.47**	**1.12**	**13.02**	**21.78**	**16.38**	**-783.82**
	S.D	402.01	1860.94	57.46	24.43	110.60	43.17	45.59	38.22	1879.21
Computer and IT	*Minimum*	-1423.18	-117238.68	-39.68	-233.33	-1360.78	-378.86	-231.21	-223.31	-117452.68
	Maximum	93369.82	5947.78	209.50	251.59	799.10	5819.00	4282.20	4093.20	5929.53
	Mean	**1388.75**	**1645.29**	**6.23**	**5.37**	**4.98**	**61.69**	**46.99**	**46.31**	**1647.91**
	S.D	7720.13	7311.69	17.48	26.70	61.55	365.61	276.99	259.77	7302.86

Table 6.2 Descriptive statistics for all industries (contd.)

Industry	**Statistics**	**Variables**								
		MVA	**EVA**	**EPS**	**ROCE**	**RONW**	**NI**	**OCF**	**NOPAT**	**RI**
Construction	*Minimum*	-1732.20	-90089.37	-170.20	-615.02	-289.27	-68.08	-3687.19	-15.21	-86128.82
	Maximum	72753.07	32869.59	437.55	20560.56	1524.91	3481.61	2115.23	3008.75	38742.83
	Mean	**905.01**	**-2626.77**	**16.65**	**71.00**	**21.22**	**60.13**	**31.25**	**63.94**	**-2567.85**
	S.D	5626.99	9587.69	52.32	1110.35	109.64	261.07	327.53	238.54	9677.13
Diversified	*Minimum*	-1882.57	-21336.26	-21.28	-23.82	-27.31	-241.23	-24.59	-103.61	-21212.26
	Maximum	8942.08	3174.64	83.80	48.16	53.58	670.99	485.97	523.64	3174.33
	Mean	**82.20**	**3201.56**	**12.30**	**6.56**	**9.60**	**46.44**	**74.04**	**61.81**	**-3231.64**
	S.D	1199.14	4352.60	18.13	10.31	13.76	102.89	95.95	89.80	4362.15
Power Generation	*Minimum*	-5091.43	-362015.92	-63.70	-75.92	-187.29	-192.06	-172.04	-26.59	-362745.47
	Maximum	23666.16	3608.77	491.37	50.39	288.15	1213.45	3460.66	1068.76	3650.60
	Mean	**638.64**	**10980.01**	**14.65**	**8.65**	**10.81**	**131.42**	**200.65**	**138.32**	**-11117.52**
	S.D	3585.15	30693.30	41.08	15.09	32.10	257.99	423.06	239.15	30874.01
Electronics	*Minimum*	-6865.41	-199233.47	-116.71	-2393.94	-449.29	-273.20	-1961.97	-158.12	-199288.63
	Maximum	10578.33	23064.81	113.96	6466.67	9142.86	858.76	991.16	973.95	22805.98
	Mean	**2.51**	**1707.78**	**3.89**	**0.03**	**33.56**	**18.37**	**20.14**	**22.65**	**-1710.74**
	S.D	781.76	9853.33	21.05	329.53	420.21	100.59	146.70	93.54	9803.66
FMCG	*Minimum*	-1304.43	-21482.21	-7.07	-11.94	-17.16	-4.17	-1.59	-0.79	-21552.25
	Maximum	51477.92	5.03	69.46	141.53	145.04	2496.45	1723.19	1856.82	5.17
	Mean	**5063.23**	**-3251.40**	**12.35**	**23.34**	**25.90**	**217.94**	**213.80**	**176.47**	**-3317.82**
	S.D	12768.67	5491.28	14.74	26.86	27.94	487.04	421.17	378.64	5570.01
Footwear	*Minimum*	-108.18	-2095.57	-17.82	-131.33	-121.07	-62.75	-23.85	-32.53	-2143.78
	Maximum	1118.01	0.00	35.57	26.82	35.60	60.74	56.83	47.02	0.00
	Mean	**42.23**	**-450.31**	**6.22**	**4.61**	**5.94**	**6.83**	**8.54**	**7.38**	**-454.49**
	S.D	215.49	431.96	7.19	18.07	17.33	13.73	14.74	10.53	438.53

Table 6.2 Descriptive statistics for all industries (contd.)

Industry	Statistics	Variables								
		MVA	EVA	EPS	ROCE	RONW	NI	OCF	NOPAT	RI
Gems & Jewelry	*Minimum*	-638.49	-11629.71	-25.16	-90.37	-88.99	-254.18	-210.17	-143.45	-11230.92
	Maximum	5030.19	6916.22	61.53	5267.30	564.34	206.56	2045.73	217.88	6644.75
	Mean	**66.13**	**914.94**	**9.33**	**40.78**	**13.05**	**11.15**	**27.64**	**17.01**	**945.11**
	S.D	628.74	1990.55	12.85	416.13	47.42	44.19	209.87	36.71	1967.28
Hotels & Restaurant	*Minimum*	-2014.89	-22138.45	-5.15	-34.54	-115.52	-10.42	-44.79	-3.52	-22226.06
	Maximum	5461.69	15909.42	58.12	53.71	370.59	377.46	496.62	406.26	15640.61
	Mean	**67.88**	**1364.63**	**5.69**	**5.40**	**9.37**	**24.64**	**38.30**	**29.05**	**1387.66**
	S.D	771.73	4261.69	9.09	9.81	37.68	58.24	81.82	64.76	4281.64
Machinery	*Minimum*	-956.55	-13718.95	-33.24	-318.33	-343.87	-47.55	-847.79	-23.54	-11589.36
	Maximum	3578.78	2867.18	1197.08	800.00	415.96	271.44	483.49	264.91	2891.88
	Mean	**76.99**	**619.89**	**15.15**	**4.55**	**5.49**	**12.28**	**11.14**	**13.43**	**615.84**
	S.D	385.10	1377.17	71.64	61.38	46.03	38.12	67.52	32.82	1314.09
Metal and Metal products	*Minimum*	-1046.67	-105687.08	-18.96	-167.39	-686.82	-44.88	-61.18	-12.91	-106929.47
	Maximum	22049.62	2885.64	465.46	100.39	186.58	4441.81	4169.17	3901.68	2879.89
	Mean	**278.76**	**2379.64**	**12.99**	**4.84**	**6.22**	**78.77**	**85.03**	**76.31**	**2399.48**
	S.D	1942.59	9398.33	43.51	21.19	50.11	450.18	419.33	380.02	9478.71
Miscellaneous	*Minimum*	-21592.36	-531393.96	-41.64	-7223.08	-3455.68	-492.48	-1231.00	-218.69	-531440.07
	Maximum	206191.85	298341.44	167.13	238.91	299.29	19506.39	23274.81	15408.40	296023.81
	Mean	**1754.37**	**10719.39**	**10.52**	**-5.15**	**5.13**	**342.08**	**461.42**	**338.29**	**10980.64**
	S.D	12563.92	49133.25	19.91	248.23	108.91	1736.43	2298.41	1594.59	50206.46
Paper	*Minimum*	-1496.96	-41045.50	-29.88	-1417.82	-7763.64	-42.00	-139.15	-24.83	-41058.28
	Maximum	16533.07	12969.17	1911.62	403.77	305.14	309.74	328.35	284.56	12965.40
	Mean	**154.85**	**1739.38**	**10.90**	**-4.47**	**-22.87**	**15.54**	**25.35**	**19.91**	**-1754.52**
	S.D	1578.48	4716.55	112.29	91.21	456.07	46.63	56.91	44.50	4717.94

Table 6.2 Descriptive statistics for all industries (contd.)

Industry	Statistics	Variables								
		MVA	**EVA**	**EPS**	**ROCE**	**RONW**	**NI**	**OCF**	**NOPAT**	**RI**
Pharmaceutical	*Minimum*	-1473.05	-37525.87	-47.97	-264.69	-3771.87	-1044.80	-899.24	-881.53	-38007.75
	Maximum	21032.61	12091.33	95.40	238.77	352.94	1265.29	945.32	838.61	11969.59
	Mean	**609.14**	**1252.86**	**10.86**	**7.49**	**4.32**	**40.92**	**29.67**	**36.88**	**-1255.40**
	S.D	2114.28	3323.67	16.83	26.05	135.77	125.32	88.17	96.09	3317.41
Plastic	*Minimum*	-1037.89	-105718.16	-68.73	-812.12	-581.64	-273.16	-137.25	-163.01	-105831.13
	Maximum	2469.35	21471.43	105.77	9850.00	3500.00	145.54	247.62	199.76	21376.26
	Mean	**38.41**	**1003.28**	**1.97**	**16.97**	**10.49**	**4.52**	**16.20**	**10.10**	**1019.81**
	S.D	235.98	5812.75	11.18	397.89	147.81	25.70	34.24	23.38	5815.86
Textile	*Minimum*	-6972.40	-369853.88	-524.74	-2678.81	-984.41	-383.17	-196.17	-120.17	-369867.60
	Maximum	16955.97	55075.74	675.02	1111.38	1836.18	2232.60	2213.87	2019.16	55009.21
	Mean	**-97.80**	**1665.55**	**3.29**	**-5.40**	**1.84**	**12.70**	**33.54**	**22.12**	**1694.39**
	S.D	818.41	12687.33	34.07	130.62	94.97	114.59	132.24	105.94	12708.27
Trading	*Minimum*	-542.96	-104023.00	-37.28	-188.02	-848.29	-160.48	-1063.15	-69.57	-104023.00
	Maximum	11155.53	25441.01	144.59	200.00	284.85	420.30	845.96	475.21	25476.07
	Mean	**93.34**	**18982.00**	**3.51**	**3.31**	**1.44**	**7.93**	**3.37**	**10.28**	**18970.00**
	S.D	716.27	44300.00	12.81	24.50	48.98	38.16	82.44	42.87	44300.00
Transport Services	*Minimum*	-5914.45	-48552.91	-24.97	-151.87	-527.05	-352.57	-119.57	-202.44	-49029.74
	Maximum	1135.96	16629.00	87.46	47.27	188.18	1419.91	1364.18	953.03	16228.73
	Mean	**476.98**	**4551.63**	**10.21**	**2.93**	**7.46**	**127.32**	**184.27**	**108.04**	**4688.73**
	S.D	986.93	9122.88	20.89	23.57	57.58	289.39	329.94	204.22	9270.43

Cash Flow From Operations (OCF) figures given in Table 6.2 reveals that all industries have positive OCF value implying that business operations have created positive cash in each industry under study during 2000-2009. Similar to NI and NOPAT figures, miscellaneous sectors outperform other industries in average in case of OCF. It is followed by FMCG, power generation, cement, transportation and metal and metal product industries. Trading and footwear sector are at the end with the mean of OCF worth Rs 3.37 crore and Rs 8.54 crore respectively. Lastly, Residual Income- another variant of economic profit figure show that trading companies with Rs 18970 crore figures outperform others and out of 23 sectors, 09 sectors reported negative RI during the study period concluding that these industries are not able to earn more than their Cost of Capital. These sectors include footwear, chemical, pharmaceutical, electronics, paper, constriction, diversified, FMCG and power generation.

Power generation and FMCG are worst performer with negative RI figures of Rs. -11117.50 crore and Rs. -3317.82 crore respectively. One important observation from the descriptive statistics about RI and EVA is that whereas, nine sectors have reported negative RI, only four out of 23 have negative EVA. This difference can be attributed to the effect of accounting adjustments (Stern-Stewart adjustments) since the only difference between RI and EVA is of accounting adjustments. It concludes that in case of sample industries, accounting adjustments have positive influence on the EVA of different industries.

6.3.1 CORRELATION STATISTICS

Industry wise correlation matrix of MVA and eight explanatory variables is presented in Table 6.3. Analysis of correlation statistics about agriculture products display that MVA is positive and statistically significant for all explanatory variables except Residual Income (RI) which is negatively but statistically significant for 'market value added' measure of the of the companies in agriculture products. Highest correlation between dependent and independent variables can be observed between MVA and Net Income (NI). It is followed by NOPAT and OCF. The correlation coefficients of NI, NOPAT & OCF are 0.733, 0.731 and 0.501 respectively. Coefficients about agriculture industry further reveals that correlation between MVA and EVA is lowest with a positive and statistically significant value of 0.203. The statistics of agriculture products about relationship between MVA and EVA is contrary to the Stern-Stewart claim that EVA has highest correlation with MVA. Traditional measures even ROCE, RONW and EPS outperform EVA in terms of relationship with MVA.

Table 6.3 Correlation matrix for all industries

Industries	Statistics	Variables								
		MVA	EVA	EPS	ROCE	RONW	NI	OCF	NOPAT	RI
Agriculture Products	**MVA**	1								
	EVA	.203**	1							
	EPS	.292**	-.163**	1						
	ROCE	.336**	-.087	.270**	1					
	RONW	.218**	-.068	.242**	.377**	1				
	NI	.733**	-.359**	.426**	.364**	.289**	1			
	OCF	.501**	-.068	.223**	.214**	.132**	.572**	1		
	NOPAT	.731**	-.460**	.397**	.342**	.263**	.954**	.501**	1	
	RI	-.214**	.896**	-.164**	-.090	-.067	-.367**	-.142**	-.460**	1
Automobile and automobile parts	**MVA**	1								
	EVA	.284**	1							
	EPS	.195**	-.052	1						
	ROCE	.124**	-.008	.111*	1					
	RONW	.023	-.003	.020	-.009	1				
	NI	.875**	-.352**	.180**	.150**	.023	1			
	OCF	.624**	-.349**	.156**	.085	.019	.739**	1		
	NOPAT	.866**	-.445**	.201**	.141**	.025	.961**	.804**	1	
	RI	-.295**	.899**	-.055	-.009	-.003	-.370**	-.391**	-.466**	1
Business Consultancy	**MVA**	1								
	EVA	-.054	1							
	EPS	.856**	-.215*	1						
	ROCE	.437**	-.157	.559**	1					
	RONW	.320**	-.168	.505**	.926**	1				
	NI	.588**	-.471**	.807**	.501**	.552**	1			
	OCF	.334**	-.585**	.606**	.385**	.460**	.846**	1		
	NOPAT	.418**	-.615**	.675**	.445**	.524**	.962**	.892**	1	
	RI	-.053	0.783**	-.217*	-.158	-.170	-.473**	-.598**	-.618**	1

Table 6.3 Correlation matrix for all industries (contd.)

Industries	Statistics	Variables								
		MVA	EVA	EPS	ROCE	RONW	NI	OCF	NOPAT	RI
Cement	MVA	1								
	EVA	.138	1							
	EPS	-.116	.007	1						
	ROCE	-.165*	.006	.028	1					
	RONW	.048	.013	.030	-.003	1				
	NI	.870**	-.166*	.210**	.242**	.059	1			
	OCF	.837**	-.209**	.209**	.212**	.057	.941**	1		
	NOPAT	.846**	-.213**	.217**	.221**	.058	.985**	.965**	1	
	RI	-.142*	1.000**	.006	.005	.013	-.170*	-.215**	-.217**	1
Chemical and chemical products	MVA	1								
	EVA	-.001	1							
	EPS	.023	.004	1						
	ROCE	.073	-.084*	.112**	1					
	RONW	.028	-.044	.070	.267**	1				
	NI	.325**	-.260**	.086*	.202**	.151**	1			
	OCF	.119**	-.544**	.038	.151**	.056	.626**	1		
	NOPAT	.226**	-.406**	.074	.240**	.134**	.903**	.728**	1	
	RI	.003	1.000**	.005	-.082*	-.040	-.251**	-.555**	-.399**	1
Computer and IT	MVA	1								
	EVA	-.872**	1							
	EPS	.434**	-.410**	1						
	ROCE	.204**	-.175**	.433**	1					
	RONW	.092**	-.079*	.218**	.445**	1				
	NI	.862**	-.960**	.443**	.196**	.094**	1			
	OCF	.788**	-.897**	.453**	.176**	.083*	.913**	1		
	NOPAT	.867**	-.965**	.479**	.199**	.095**	.992**	.931**	1	
	RI	.870**	0.798**	-.411**	-.174**	-.079*	-.959**	-.906**	-.965**	1

Table 6.3 Correlation matrix for all industries (contd.)

Industries	Statistics	Variables								
		MVA	EVA	EPS	ROCE	RONW	NI	OCF	NOPAT	RI
Construction	MVA	1								
	EVA	.489**	1							
	EPS	.072	-.034	1						
	ROCE	-.007	.014	-.043	1	.294**				
	RONW	.023	.036	.046	.294**	1				
	NI	.861**	-.683**	.089	-.011	.012	1			
	OCF	.125*	-.625**	.070	-.005	-.034	.322**	1		
	NOPAT	.858**	-.732**	.086	-.013	.014	.990**	.334**	1	
	RI	-.450**	.998**	-.034	.014	.038	-.649**	-.671**	-.698**	1
Diversified	MVA	1								
	EVA	.323**	1							
	EPS	.051	-.258**	1						
	ROCE	.323**	-.012	.549**	1					
	RONW	.225*	-.029	.627**	.940**	1				
	NI	.294**	-.454**	.390**	.329**	.331**	1			
	OCF	.261**	-.661**	.347**	.201*	.213*	.395**	1		
	NOPAT	.375**	-.694**	.430**	.289**	.303**	.898**	.611**	1	
	RI	-.318**	.999**	-.257**	-.011	-.029	-.422**	-.679**	-.670**	1
Power Generation	MVA	1								
	EVA	.148*	1							
	EPS	.142*	.034	1						
	ROCE	.344**	.096	.394**	1					
	RONW	.149*	.064	.247**	.642**	1				
	NI	.357**	-.277**	.137*	.182**	.098	1			
	OCF	.051	-.422**	.042	.026	.012	.689**	1		
	NOPAT	.280**	-.428**	.111	.145*	.078	.951**	.802**	1	
	RI	.051	1.000**	.035	.097	.065	-.279**	-.434**	-.432**	1

Table 6.3 Correlation matrix for all industries (contd.)

Industries	Statistics	Variables								
		MVA	EVA	EPS	ROCE	RONW	NI	OCF	NOPAT	RI
Electronics	MVA	1								
	EVA	.142**	1							
	EPS	.193**	-.165**	1						
	ROCE	.008	.001	.042	1					
	RONW	.005	.019	-.015	.018	1				
	NI	.330**	-.313**	.508**	.019	-.009	1			
	OCF	.384**	.005	.138**	.003	-.011	.147**	1		
	NOPAT	.230**	-.358**	.517**	.016	-.009	.960**	.184**	1	
	RI	.035	0.784**	-.161**	.002	.019	-.302**	-.021	-.348**	1
FMCG	MVA	1								
	EVA	.635**	1							
	EPS	.023	-.202*	1						
	ROCE	.577**	-.269**	.268**	1					
	RONW	.569**	-.288**	.326**	.983**	1				
	NI	.955**	-.710**	.039	.604**	.597**	1			
	OCF	.948**	-.761**	.067	.564**	.569**	.974**	1		
	NOPAT	.951**	-.717**	.049	.586**	.587**	.986**	.982**	1	
	RI	-.635**	1.000**	-.203*	-.268**	-.288**	-.708**	-.763**	-.715**	1
Footwear	MVA	1								
	EVA	.405**	1							
	EPS	-.006	.041	1						
	ROCE	.097	-.129	.617**	1					
	RONW	.062	-.135	.653**	.987**	1				
	NI	.539**	-.390**	.324**	.453**	.416**	1			
	OCF	.429**	-.535**	.067	.212	.201	.561**	1		
	NOPAT	.573**	-.505**	.346**	.466**	.436**	.878**	.628**	1	
	RI	-.398**	.999**	.052	-.120	-.127	-.380**	-.565**	-.492**	1

Table 6.3 Correlation matrix for all industries (contd.)

Industries	Statistics	Variables								
		MVA	EVA	EPS	ROCE	RONW	NI	OCF	NOPAT	RI
Gems & Jewelry	MVA	1								
	EVA	.594**	1							
	EPS	.303**	.130	1						
	ROCE	.011	.026	-.129	1					
	RONW	.090	.108	.133	.097	1				
	NI	.422**	-.175*	.470**	-.153	.180*	1			
	OCF	.133	.103	.276**	-.004	.085	.344**	1		
	NOPAT	.456**	-.372**	.436**	-.041	.043	.912**	.372**	1	
	RI	.107	.979**	.089	.024	.092	-.216**	-.097	-.421**	1
Hotels & Restaurant	MVA	1								
	EVA	.561**								
	EPS	.172*	-.186*	1						
	ROCE	.170*	-.003	.449**	1					
	RONW	.045	.133	.058	.267**	1				
	NI	.704**	-.581**	.303**	.147	.040	1			
	OCF	.634**	-.563**	.264**	.098	.023	.962**	1		
	NOPAT	.671**	-.575**	.260**	.113	.028	.988**	.975**	1	
	RI	-.463**	1.000**	-.187*	-.003	.132	-.587**	-.570**	-.581**	1
Machinery	MVA	1								
	EVA	.541**	1							
	EPS	.264**	-.204**	1						
	ROCE	.085	-.050	.065	1					
	RONW	.110*	-.026	.084	.313**	1				
	NI	.697**	-.701**	.313**	.121*	.171**	1			
	OCF	.015	.149**	.337**	.036	.050	.097*	1		
	NOPAT	.736**	-.787**	.318**	.117*	.173**	.972**	.052	1	
	RI	-.532**	.995**	-.233**	-.050	-.025	-.693**	.057	-.779**	1

Table 6.3 Correlation matrix for all industries (contd.)

Industries	Statistics	Variables								
		MVA	EVA	EPS	ROCE	RONW	NI	OCF	NOPAT	RI
Metal and Metal products	MVA	1								
	EVA	.700**	1							
	EPS	.344**	-.226**	1						
	ROCE	.359**	-.222**	.328**	1					
	RONW	.154*	-.104	.152*	.328**	1				
	NI	.846**	-.845**	.331**	.355**	.152*	1			
	OCF	.822**	-.864**	.305**	.334**	.145*	.989**	1		
	NOPAT	.852**	-.834**	.340**	.363**	.158**	.996**	.988**	1	
	RI	-.698**	1.000**	-.224**	-.221**	-.103	-.844**	-.864**	-.832**	1
Miscellaneous	MVA	1								
	EVA	.601**	1							
	EPS	.413**	-.391**	1						
	ROCE	.018	-.016	.054	1					
	RONW	.030	-.002	.124**	.029	1				
	NI	.836**	-.779**	.509**	.021	.034	1			
	OCF	.755**	-.772**	.477**	.020	.031	.928**	1		
	NOPAT	.802**	-.795**	.518**	.022	.036	.984**	.961**	1	
	RI	-.606**	1.000**	-.393**	-.016	-.002	-.785**	-.786**	-.803**	1
Paper	MVA	1								
	EVA	.670**	1							
	EPS	.064	-.008	1						
	ROCE	.014	-.034	.023	1					
	RONW	.007	.179**	.008	.004	1				
	NI	.530**	.686**	.026	.041	.027	1			
	OCF	.104	-.550**	-.031	.045	.037	.718**	1		
	NOPAT	.406**	.711**	.027	.048	.033	.931**	.815**	1	
	RI	.663**	0.869**	-.007	-.035	.178**	-.685**	-.560**	-.713**	1

Table 6.3 Correlation matrix for all industries (contd.)

Industries	Statistics	Variables								
		MVA	EVA	EPS	ROCE	RONW	NI	OCF	NOPAT	RI
Pharmaceutical	MVA	1								
	EVA	.699**	1							
	EPS	.294**	-.304**	1						
	ROCE	.165**	-.116**	.438**	1					
	RONW	.044	-.032	.135**	.504**	1				
	NI	.774**	-.674**	.448**	.214**	.064	1			
	OCF	.609**	-.497**	.434**	.189**	.052	.770**	1		
	NOPAT	.765**	-.662**	.478**	.227**	.068	.968**	.826**	1	
	RI	-.699**	.999**	-.302**	-.115**	-.032	-.667**	-.507**	-.657**	1
Plastic	MVA	1								
	EVA	.302**	1							
	EPS	-.046	-.021	1						
	ROCE	.010	.008	-.004	1					
	RONW	.022	.032	.015	.053	1				
	NI	.143**	-.012	.557**	.000	.036	1			
	OCF	-.292**	-.100*	.287**	-.013	.005	.440**	1		
	NOPAT	.053	-.131**	.471**	-.007	.030	.842**	.598**	1	
	RI	-.027	1.000**	-.020	.008	.033	-.010	-.108**	-.130**	1
Textile	MVA	1								
	EVA	.604**	1							
	EPS	.238**	-.046	1						
	ROCE	.003	-.005	.046	1					
	RONW	.018	.039	.078*	-.015	1				
	NI	.571**	-.157**	.448**	.037	.058	1			
	OCF	.509**	-.223**	.311**	.005	.012	.841**	1		
	NOPAT	.589**	-.200**	.394**	.032	.037	.952**	.922**	1	
	RI	-.104**	1.000**	-.045	-.004	.039	-.158**	-.229**	-.202**	1

Table 6.3 Correlation matrix for all industries (contd.)

Industries	Statistics	Variables								
		MVA	EVA	EPS	ROCE	RONW	NI	OCF	NOPAT	RI
Trading	MVA	1								
	EVA	.607**	1							
	EPS	.150**	.012	1						
	ROCE	.069	.062	.266**	1					
	RONW	.058	.114**	.213**	.537**	1				
	NI	.598**	.019	.540**	.206**	.174**	1			
	OCF	.508**	.001	.128**	-.002	.009	.307**	1		
	NOPAT	.677**	.011	.418**	.142**	.118**	.921**	.297**	1	
	RI	.007	1.000**	.012	.062	.114**	.019	.001	.011	1
Transport Services	MVA	1								
	EVA	.629**	1							
	EPS	-.153	-.394**	1						
	ROCE	-.170	-.154	.336**	1					
	RONW	-.071	-.068	.167	.099	1				
	NI	.486**	-.763**	.541**	.283**	.106	1			
	OCF	-.565**	-.749**	.426**	.221*	.109	.859**	1		
	NOPAT	.556**	-.797**	.537**	.286**	.117	.975**	.908**	1	
	RI	.536**	1.000**	-.392**	-.154	-.070	-.763**	-.764**	-.800**	1

Note: ** and *implies estimates are statistically significant at $p \leq 0.01$ and $p \leq 0.05$ respectively

Correlation matrix of automobile sector as presented in Table 6.3 reveals similar results as that of agriculture products. Similar to agriculture sector, MVA and NI are highly correlated. Negative correlation can be found between MVA and RI. The correlation statistics between MVA and NI is 0.875 and statistically significant at 0.01 levels. It is followed by NOPAT (0.866), OCF (0.624) and EVA (0.284). Although EVA does not outperform NI, NOPAT and OCF but it outperforms EPS, RONW and ROCE. Lowest and statistically insignificant correlation can be found between MVA and RONW. Overall results conclude that association between MVA and traditional financial performance measures is better than value based measures.

Analysis of business consultancy sectors which include nine firms during the period 2000-2009 reveal that EPS outperforms other variables in terms of association with MVA. EPS is followed by Net Income (NI) and Return On Capital Employed (ROCE). Whereas, EVA and RI are negatively correlated with shareholder wealth as measured by MVA. Further the correlation coefficients of EVA and RI are also not statistically significant at any given level. Correlation coefficient of MVA and EPS is 0.856 whereas 0.588 and 0.437 for NI and ROCE respectively. Results of cement sector also reveal that statistically insignificant and weak correlation between MVA and EVA with correlation coefficient of 0.138. Net income, NOPAT and Cash Flow From Operations(OCF) exhibit high, positive and statistically significant correlation coefficients with MVA and they outperform other measures with correlation coefficients .870, .846 and .837 respectively. Results further reveal that correlation coefficients of EPS and RONW are low and statistically insignificant.

Closer examination of correlation coefficients of chemical and chemical products industry show that measures like NOPAT, NI and OCF continue to dominate other traditional accounting based measures and also EVA and RI in terms of their relationship with MVA. EVA and RI have very weak and statistically insignificant correlation coefficients with MVA. One important observation from the results of chemical industry is that RI is positively associated with MVA, whereas EVA has negative association with MVA.

Table 6.3 display the results of computer and IT industry. It is evident from the table that except ROCE and RONW, other independent variables have strong correlation coefficients with MVA and results are quite different from the above sectors. Market Value Added (MVA) and EVA- popular value based has highest correlation coefficient (.872) followed by RI (0.870) and

NOPAT (.867). The results are consistent with earlier study by Lehn & Makhija (1996) and Stewart (1991) who claimed that EVA is better correlated with MVA as compared with earnings or other accounting measures. More importantly, in Computer& IT industry all the measures are positively correlated with MVA and have statistically significant coefficients. Analysis of correlation coefficients of construction sector, which includes 38 companies, show that NOPAT and NI have better correlation coefficients as compared to EVA. Further EPS, ROCE, RONW and OCF have very weak correlation with Market Value Added. Highest correlation among dependent and explanatory variables can be observed between MVA and NI (.861) followed by NOPAT (0.858) and EVA (.458). RI and ROCE are negatively correlated with MVA and also ROCE coefficient is statistically insignificant. Correlation results further explain that although EVA underperforms NOPAT and NI but it outperforms EPS, ROCE, RONW and OCF. Overall, traditional mandated performance measures such as NI and NOPAT have better association with MVA as compared to EVA.

Results of Diversified sector as presented in Table 6.3 conclude that not much strong association exists between independent variables and MVA. It is evident from the correlation coefficients that highest value is of NOPAT (.375). Table further reveals that except earnings per share (EPS), all measures have statistically significant coefficients. EVA and ROCE both have same (.323) level of positive correlation with MVA and follow NOPAT. Similar to construction, business consultancy, cement and agriculture sector, RI is negatively but statistically significant in associated with MVA. Similar to diversified sector, not much strong correlation coefficient are reported in power sector. All the independent variables have positive association with MVA. Further, OCF and RI have same correlation coefficient (0.051) and also statistically insignificant. Highest correlation between MVA and independent variables can be observed between MVA and NI (.357). ROCE and NOPAT follow NI with correlation coefficients .344 and .280 respectively. Very low (.148) but positive correlation coefficient of EVA indicates that traditional measures outperform EVA in terms of association with MVA.

Examination of correlation matrix as presented in Table 6.3 reveals that low to moderate correlation coefficients are found in electronics, footwear and plastic industries. Highest coefficients of MVA and independent variables in Electronics can be observed between Cash Flow From Operations (.384) followed by net income (.330) and NOPAT (.230). All these coefficients are positive and statistically significant. In footwear industry, NOPAT outperforms other measures as it exhibits highest (.573) correlation coefficient with MVA. Similar to results of many industries NI and OCF follow NOPAT with .539 and .429 correlation coefficients respectively. EVA has positive correlation coefficient of .450 and also statistically significant at 0.001 level.

Results of plastic industry are contrary to Electronics and Footwear industry. EVA, value based measure, has positive and highest association with MVA. The correlation coefficient of EVA is .302 and also statistically significant. EVA is followed by OCF (-.292) and NOPAT (.143), both with statistically significant coefficients. Further, EPS, OCF and RI have negative and statistically insignificant association with MVA. NOPAT, ROCE, RONW although have positive correlation coefficients but also statistically insignificant. Overall results about plastic industry support the claim of EVA proponents about its stronger association with MVA as compared to traditional measures. Gems & jewelry, paper, textile and transport service industries also show that EVA has better association with MVA as revealed by highest, positive and statistically significant coefficients. Correlation coefficient of MVA and EVA are .594, .670, .604 and .629 for gems & jewelry, paper, textile and transport service industries respectively. In gems & jewelry, lowest coefficients are about RONW, ROCE, OCF and RI and they are also statistically insignificant at given level of significance. NOPAT (.456), NI (.422) and EPS (.303) follow EVA with positive and statistically significant correlation coefficients.

Closer examination of paper industry results shows that Residual Income (another variant of economic profit) follows EVA with positive and statistically significant coefficient (.663). NI (.530) and NOPAT (.406) follow Residual Income in association with MVA. Similar to gems and jewelry sector, RONW, ROCE, OCF and EPS have low and also statistically insignificant association with MVA. In case of textile industry, RI has negative association with MVA, whereas ROCE and RONW have weak and also statistically insignificant correlation coefficients.

Negative and statistically insignificant coefficients of EPS, ROCE and RONW can be seen in transport services whereas, OCF has negative but has statistically significant coefficient. Further, NOPAT (.556), RI (.536) and NI (486) follow Economic Value Added (EVA) with positive and statistically significant coefficients. Overall correlation results about gems & jewelry, paper, textile and transport service industries exhibit stronger and highest association of EVA with

MVA. Thereby, concluding that EVA outperforms traditional measures in terms of association with MVA.

Net Income (NI) outperforms other traditional and value based measures in FMCG, hotels & restaurant, miscellaneous and pharmaceutical sector, as evident from correlation coefficients of MVA and independent variables. The reported correlation coefficient of NI ranges from .774 to .955 implying that the association of NI and MVA is very strong. Table 6.3 further reveals that in case of FMCG sector, except EPS, all other measures are highly associated with MVA and also the association is statistically significant. NOPAT and OCF follow NI in FMCG sector whereas RI is negatively correlated with MVA. The association of traditional measures in FMCG sector is perfect and results are similar to Chen & Dodd (1996, 2001), Biddle *et al.* (1996), Maditions *et al.* (2009) etc. who concluded that earnings outperform EVA in terms of association with MVA and stock returns.

Further analysis of results about hotels and restaurant industry shows that similar to FMCG sector, NOPAT and OCF follow NI and RI exhibits negative association with MVA. One departure from the results of FMCG sector is that EPS, RONW and ROCE have very low and statistically insignificant coefficients. RONW has lowest (0.045) and statistical insignificant correlation coefficient. Similar to FMCG and hotel sector, RONW and ROCE have very low and statistically insignificant association with MVA in miscellaneous sector which consists of many industries. Also EVA outperforms RONW, ROCE, EPS and RI but it underperforms NOPAT and OCF. Correlation coefficients of Pharmaceutical industry further reveal that NOPAT follows NI. EVA with correlation coefficient of .699 stands at third place in terms of association with MVA. EVA outperforms OCF, EPS, ROCE and RONW but underperforms NOPAT and NI similar to results of miscellaneous sectors.

Lastly, analysis of machinery, metal & metal products and trading sector results as presented in Table 6.3 exhibits that NOPAT outperforms EVA and other traditional measures in all three industries. Highest (.852) correlation coefficient of NOPAT and MVA can be found in metal and metal products followed by .736 in machinery and .677 in trading industry. ROCE and RONW exhibit lowest correlation with MVA in machinery and trading sector. Important observation from trading sector results is that EVA follow NOPAT and reflects very little difference in the correlation coefficients of EVA and NOPAT i.e. .677 and .607 respectively.

Further, RI has lowest and statistically insignificant correlation coefficient in trading sector. Whereas in metal industry, NI and OCF underperform NOPAT but they outperform EVA. Lowest but statistically significant coefficient can be found between MVA and RONW. In machinery sector, NI and EVA follow NOPAT with statistically significant coefficients of .697 and .541 respectively. Cash Flow From Operations (OCF) has lowest (.015) and statistically insignificant correlation coefficient. Results of correlation statistics about all industries conclude that in majority of industries, Net Operating Profit After Tax (NOPAT), Net Income (NI) and Cash Flow From Operations (OCF) are highly correlated with Market Value Added (MVA). Economic Value Added (EVA) although positively associated with MVA in all industries, but it outperforms ROCE, RONW, EPS in 18 sectors out of 23 but underperforms NI, NOPAT and OCF in majority of the cases. Overall, the correlation statistics refute the claim of EVA proponents about its superiority in terms of association with MVA. It leads to conclusion that traditional performance measures are better associated with MVA in the sample industries.

6.4 EMPIRICAL RESULTS – MULTIVARIATE REGRESSION ANALYSIS

In this section, regression results of different industries based on multivariate regression are presented. The main objective of multivariate regression analysis was to know the determinants of MVA in different industries. In the next section, univariate regression based different performance measures of different industries are examined to know the relative information content of various performance measurers and rank them accordingly.

$$MVA_{it} = b_0+b_1EVA_{it}+b_2EPS_{it}+b_3ROCE_{it}+b_4RONW_{it}+b_5OCF_{it}+ b_6NOPAT_{it}+b_7\,NI_{it}+b_8RI_{it}+e_{it} \quad \textbf{(6.1)}$$

Where

MVA_{it} = Market Value Added for firm i in period t
EVA_{it} = Economic Value Added for firm i in period t
EPS_{it} = Earnings Per Shares for firm i in period t
$ROCE_{it}$ = Return On Capital Employed for firm i in period t
$RONW_{it}$ = Return On Net Worth for firm i in period t
OCF_{it} = Cash Flows From Operations for firm i in period t
$NOPAT_{it}$ = Net Operating Profit After Tax for firm i in period t
NI_{it} = Net Income for firm i in period t
RI_{it} = Residual Income for firm i in period t
e_{it} = random disturbance term
b_o = constant term

The above multivariate regression model was applied to all industries and results are analyzed in order to know the value relevance of various measure in different industries and to find how well these measures behave in explaining the contemporaneous MVA of the different industries.

Table 6.4 Industry wise multiple regression coefficients

$y = b_0 + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + b_6x_6 + b_7x_7 + b_8x_8 + u$

Industries	**Constant term**	**Regression Coefficients**							
		EVA	**EPS**	**ROCE**	**RONW**	**NI**	**OCF**	**NOPAT**	**RI**
	b_0	b_1	b_2	b_3	b_4	b_5	b_6	b_7	b_8
Agriculture Products	104.501 (2.29) 0.023	26.331* (6.36) 0.000	1.551 (0.62) 0.537	2.644** (1.97) 0.049	-0.103 (-0.13) 0.898	-8.212* (-2.80) 0.005	53.282* (6.58) 0.000	26.276* (5.95) 0.000	26.397* (6.38) 0.000
Automobile and automobile parts	89.74 (2.73) 0.006	7.870* (19.36) 0.000	-0.946 (-1.54) 0.125	-1.188* (2.93) 0.004	-0.058 (-0.69) 0.491	3.967* (6.79) 0.000	15.963* (18.08) 0.000	7.010* (6.61) 0.000	7.877* (19.40) 0.000
Business Consultancy	-12.50 (-0.63) 0.529	16.75** (2.48) 0.015	10.42* (7.37) 0.000	5.252 (1.49) 0.141	-5.172** (-1.95) 0.052	2.898 (0.48) 0.631	31.09** (2.31) 0.024	33.72* (3.31) 0.001	16.72** (2.47) 0.015
Cement	150.02 (1.81) 0.071	5.39* (3.35) 0.001	-1.75*** (-1.70) 0.090	-1.78 (-1.19) 0.237	0.035 (0.13) 0.895	9.20* (5.56) 0.000	14.17* (4.29) 0.000	17.60* (5.18) 0.000	5.39* (3.35) 0.001
Chemical and chemical products	20.54 (1.18) 0.239	0.685 (1.27) 0.232	-0.061 (-0.23) 0.817	0.648 (0.98) 0.329	-0.112 (-0.78) 0.437	6.565* (6.86) 0.000	-1.489 (-1.50) 0.133	2.937** (2.57) 0.010	-0.683 (-1.27) 0.205
Computer and IT	124.9 (0.97) 0.335	15.616** (2.18) 0.029	18.896** (2.11) 0.035	5.129 (0.96) 0.335	-0.471 (-0.22) 0.824	6.331** (2.32) 0.021	-37.74* (-2.61) 0.009	44.03* (2.88) 0.004	-16.010** (-2.44) 0.025

Table 6.4 Industry wise multiple regression coefficients (contd.)

$$y = b_0 + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + b_6x_6 + b_7x_7 + b_8x_8 + u$$

Industries	Constant term	Regression Coefficients							
		EVA	EPS	ROCE	RONW	NI	OCF	NOPAT	RI
	b_0	b_1	b_2	b_3	b_4	b_5	b_6	b_7	b_8
Construction	238.6 (1.53) 0.128	21.668* (4.49) 0.000	1.181 (0.43) 0.667	0.1140 (0.86) 0.392	-0.884 (-0.66) 0.512	22.02* (3.43) 0.001	-44.109* (-4.61) 0.000	44.544* (6.30) 0.000	-21.527* (-4.46) 0.000
Diversified	286.4 (2.07) 0.041	6.380* (2.73) 0.007	22.258* (3.01) 0.003	116.11* (4.20) 0.000	-66.41* (-2.86) 0.005	-0.70 (-0.26) 0.796	-14.444* (-2.78) 0.006	23.822* (3.30) 0.001	-6.366* (-2.75) 0.007
Electronics	10.25 (0.35) 0.724	1.672** (1.93) 0.054	1.690*** (1.80) 0.069	-0.009 (-0.11) 0.911	0.018 (0.29) 0.774	12.720* (11.28) 0.000	-1.060 (-0.64) 0.521	8.956* (6.27) 0.000	1.667* (1.96) 0.050
FMCG	92.4 (0.17) 0.865	12.701* (2.98) 0.043	9.86 (0.34) 0.732	57.48 (0.74) 0.462	-71.39 (-0.94) 0.349	15.549* (3.15) 0.002	6.74 (0.33) 0.741	23.30 (1.85) 0.069	-12.291 (-1.28) 0.203
Footwear	11.24 (0.37) 0.711	28.831* (5.50) 0.000	-4.621 (-1.37) 0.175	-2.123 (-0.32) 0.748	1.294* (0.18) 0.855	0.944 (0.36) 0.718	58.41* (5.47) 0.000	46.73* (4.37) 0.000	28.734* (5.48) 0.000
Gems and Jewelry	120.03 (1.84) 0.068	3.848** (1.86) 0.057	5.195 (1.23) 0.221	0.007 (0.07) 0.948	1.427 (1.26) 0.210	-5.296 (-1.22) 0.223	7.517 (1.06) 0.290	6.681 (1.26) 0.209	3.878 (1.10) 0.273

Table 6.4 Industry wise multiple regression coefficients (contd.)

$$y = b_0 + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + b_6x_6 + b_7x_7 + b_8x_8 + u$$

Industries	Constant term	Regression Coefficients							
		EVA	EPS	ROCE	RONW	NI	OCF	NOPAT	RI
	b_0	b_1	b_2	b_3	b_4	b_5	b_6	b_7	b_8
Hotel and Restaurant	139.15 (2.65) 0.009	2.776** (2.97) 0.042	-11.579** (-2.23) 0.027	7.879*** (1.67) 0.098	0.532 (0.48) 0.633	22.655* (4.87) 0.000	-8.720 (-1.22) 0.224	4.441 (0.56) 0.574	-2.823 (-0.85) 0.394
Machinery	32.31 (2.30) 0.022	4.171* (4.13) 0.000	0.150 (0.79) 0.427	-0.002 (-0.01) 0.991	-0.525 (-1.45) 0.106	-2.189 (-1.28) 0.202	8.570* (4.20) 0.000	22.268* (9.24) 0.000	-4.090* (-4.07) 0.000
Metals and Metal products	3.01 (0.24) 0.754	5.099* (3.83) 0.000	-0.308 (-0.28) 0.777	-1.040 (-0.66) 0.511	0.029 (0.05) 0.961	1.051 (1.25) 0.214	8.600* (3.08) 0.002	3.807 (1.37) 0.172	5.156* (3.87) 0.000
Miscellaneous	43.8 (0.22) 0.822	20.225* (16.96) 0.000	7.57 (0.75) 0.455	0.016 (0.02) 0.984	0.422 (0.27) 0.789	10.617* (18.24) 0.000	40.980* (17.21) 0.000	46.430* (18.41) 0.000	20.215* (16.98) 0.000
Paper	20.65 (0.42) 0.675	21.934* (7.03) 0.000	0.655 (1.58) 0.114	0.191 (0.38) 0.706	0.511* (4.87) 0.000	18.339* (5.72) 0.000	31.481* (4.67) 0.000	50.269* (8.51) 0.000	21.700* (6.95) 0.000
Pharma	19.46 (0.40) 0.691	8.268* (10.79) 0.000	11.325* (3.83) 0.000	3.175 (1.61) 0.108	-0.262 (-0.77) 0.444	7.895* (5.91) 0.000	-14.392* (-9.05) 0.000	17.383* (7.66) 0.000	-8.404* (-11.06) 0.000
Plastic	2.589 (0.28) 0.779	1.799** (2.08) 0.038	-2.834* (-3.58) 0.000	0.002 (0.10) 0.924	0.018 (0.34) 0.731	2.421* (3.35) 0.001	0.370 (0.21) 0.835	-1.784 (-1.14) 0.257	1.796* (2.08) 0.038

Table 6.4 Industry wise multiple regression coefficients (contd.)

$$y = b_0 + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + b_6x_6 + b_7x_7 + b_8x_8 + u$$

Industries	**Constant term**	**Regression Coefficients**							
		EVA	**EPS**	**ROCE**	**RONW**	**NI**	**OCF**	**NOPAT**	**RI**
	b_0	**b_1**	**b_2**	**b_3**	**b_4**	**b_5**	**b_6**	**b_7**	**b_8**
Power Generation	180.8 (0.66) 0.511	12.282* (2.74) 0.007	-1.894 0.737 0.34	77.62* (3.94) 0.000	-11.76 (-1.37) 0.174	2.869 (0.78) 0.436	21.393** (2.44) 0.016	19.497** (2.36) 0.019	12.280* (2.74) 0.007
Textile	100.05 (5.28) 0.000	4.026* (5.24) 0.000	-3.338* (-5.45) 0.000	-0.027 (-0.20) 0.841	-0.227 (-1.21) 0.225	8.070* (13.49) 0.000	7.962* (5.23) 0.000	11.109* (7.89) 0.000	4.204* (5.24) 0.000
Trading	3.32 (0.15) 0.885	2.480 (0.96) 0.338	-8.527* (-4.07) 0.000	0.823 (0.80) 0.425	0.092 (0.18) 0.856	-3.053 (-1.32) 0.186	7.913 (1.53) 0.127	8.839** (2.49) 0.013	2.479 (0.96) 0.338
Transport Services	127.34 (1.57) 0.119	-3.099* (-2.97) 0.004	8.985** (2.28) 0.024	-1.577 (-0.51) 0.609	-0.152 (-0.13) 0.897	2.153** (1.87) 0.063	5.674* (2.72) 0.007	11.940* (4.41) 0.000	3.108* (2.99) 0.003

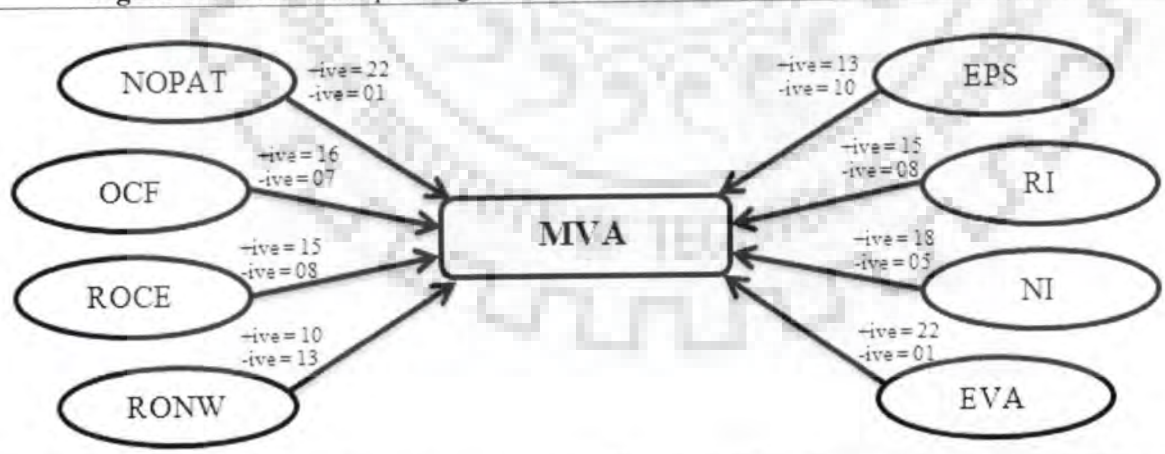
Note:

1. Figures in each column include regression coefficients, followed by t values in parentheses and p-significance value.
2. *, ** and *** implies that estimates are statistically significant $p \leq 0.01$, $p \leq 0.05$ and $p \leq 0.10$ respectively

Regression Results of model 6.1 about all industries are presented in Table 6.4 and Table 6.5. Industry wise regression coefficients are presented in Table 6.4, whereas Table 6.5 display the R-square, adjusted R- square and ANOVA results of all industries examined in the study. R-square, Adjusted R- square and ANOVA results as presented in Table 6.5 are in order of decreasing order of Adjusted R-square. Following points emerges from the regression analysis.

- Examination of regression coefficients about agriculture products as presented in Table 6.4 show that all the coefficients expect RONW and NI are positively associated with MVA. The coefficients of EVA, ROCE, OCF NOPAT, and RI are 26.33, 2.644, 53.282, 26.276 and 26.397 respectively and all are statistically significant, whereas the coefficients of EPS and RONW are positively & negatively correlated with MVA and also not statistically significant. Therefore, EPS and RONW cannot be considered as reliable predictor of MVA in agriculture sector. Further, coefficient of RONW although negatively associated with MVA with -8.212 coefficient value but has statistically significant results. R-square and adjusted R- square statistics as presented in Table 6.5 conclude that approximately 61.7% and 60.1% of the changes in the Market Value Added (MVA) of agriculture sector can be explained by all the explanatory variables together. High *t*-value of OCF, EVA and RI as given in parentheses conclude that OCF, EVA and RI have a strong effect on MVA.

Figure 6.1 Relationship of regression coefficients with MVA for all industries



Note: +ive and -ive implies relationship with MVA is positive and negative respectively; N=23

- Analysis of Variance (ANOVA) results as presented in the Table 6.5 indicates that *F*-value (84.32) is statistically significant with low *p*- value(0.000) indicating that there is strong relationship between MVA and explanatory variables thereby validating that overall significance of multiple regression model. Finally, results conclude that except EPS and RONW all can be considered as determinants of shareholders wealth in agriculture product sector.

- Results of automobile sector exhibits that EPS, ROCE and RONW have negative coefficients whereas EVA, NI, NOPAT, OCF and RI have positive and statistically significant regression coefficients. Vijayakumar and Selvi (2007) in a study about Indian automobile industry also reported negative coefficient of RONW. ROCE although has negative association with MVA but with statistical significant association. Table further show that OCF with highest regression coefficient and *t*-value (15.96) has maximum effect on Market Value Added of the Indian automobile sector followed by Residual Income (7.877), EVA (7.870) and NOPAT (7.010). Overall, EVA, NI, NOPAT, OCF, ROCE and RI are considered to be determinants of MVA of Indian automobile companies. Approximately 85 percent (adjusted R^2) changes in the MVA of sample companies can be explained by all variables together hence can be considered as reliable determinants of MVA and exist significant influence on MVA of automobile industry during the study period. Statistical significance *F*- value (475.78) with $p < 0.000$ also support that variables have significant influence on MVA. Vijayakumar and Selvi (2007) reported that EVA, EPS, ROCE, RONW and NOPAT together can explain 84 percent variation in MVA.

- In business consultancy industry, all variables except RONW are positively associated with changes in shareholder wealth (MVA). Table 6.5 further report that coefficients of Return On Capital Employed (ROCE) and Net Income (NI) are not statistically significant at any given level. Coefficients of EVA, EPS, OCF, NI and RI have positive and significant regression coefficients. It is also evident from the table that NOPAT is found to be in strong association with MVA followed by OCF, EVA, RI and EPS. Co-efficient of determination (R^2) is 0.829 implying that changes in MVA are predicted by these explanatory variables to the extent of 83 percent. The value of Adjusted R^2 and F- value shows the good fitness of the model. From regression results, it can be concluded that EVA, EPS, RONW, OCF, NOPAT and RI explain the MVA of business consultancy industry well.

Table 6.5: Industry wise results of Multiple Regression and ANOVA

S.No.	Sector	R- Square (%age)	Adj. R- Square (%)	ANOVA	
				F- Statistics	Sig.
1.	Metal	94.3	94.1	537.57	0.000
2.	FMCG	93.2	92.6	154.71	0.000
3.	Automobile	85.8	85.6	475.78	0.000
4.	Business Consultancy	82.9	81.2	48.43	0.000
5.	Computer and IT	79.9	79.8	440.89	0.000
6.	Construction	79.4	78.9	163.01	0.000
7.	Cement	78.7	77.9	102.16	0.000
8.	Miscellaneous	76.9	76.8	526.75	0.000
9.	Paper	73.0	72.3	106.77	0.000
10.	Pharmaceutical	70.9	70.6	248.57	0.000
11.	Agriculture Products	61.7	61.0	84.32	0.000
12.	Trading	58.5	57.9	88.53	0.000
13.	Machinery	57.9	57.1	75.16	0.000
14.	Hotels & Restaurant	58.3	56.2	27.96	0.000
15.	Footwear	58.3	53.6	12.41	0.000
16.	Textile	50.4	50.0	136.37	0.000
17.	Transport	45.5	41.9	12.62	0.000
18.	Electronics	36.6	35.6	37.90	0.000
19.	Diversified	37.3	32.3	7.51	0.000
20.	Power generation	29.7	26.7	10.61	0.000
21.	Gems & Jewelry	24.1	20.0	5.94	0.000
22.	Plastic	20.6	19.7	21.64	0.000
23.	Chemical	13.6	12.4	11.93	0.000

- Multiple regressions results for cement industry are depicted in Table 6.4. It is revealed from the results that Earnings Per Share (EPS) and Return On Capital Employed (ROCE) have negative relationship with MVA. Positive but statistically insignificant coefficient can be observed for RONW and MVA. The independent variables that have positive coefficients and found statistically significant are: EVA, NI, NOPAT and RI during the study period. As evident from regressions coefficients, similar to business consultancy, NOPAT is found to be in strong association with MVA. NOPAT is followed by OCF, NI, EVA and RI. Eljelly and Alghurair (2001) also observed that OCF is an important variable in explaining the changes in return for the cement industry. Interestingly EVA and RI both have same regression coefficients, *t*- value and *p*–value with MVA. Adjusted R^2 value of

77.9 percent for overall model reveal that selected independent variables can explain majority of variation in dependent variable i.e. MVA. The value of F-statistics and its significance are found fit to the regression model of 6.1.

- The outcome of chemical Industry results sense that majority of the independent variables have statistically insignificant association with MVA. Only NOPAT and NI are statistically significant in explaining the variation in the Market Value Added to chemical industry. Further EPS, RONW, OCF and RI exhibits negative association. EVA and ROCE although positive but are statistically insignificant coefficients. Correlation matrix as presented in Table 6.3 also reveals weak and statistically insignificant association with majority of independent variables with dependent variables (MVA). Net Income is found to be strongly associated with MVA followed by NOPAT. Coefficient of determination (R^2) is also lowest among all industries as reported in the Table 6.5. Only 12.4 percent of variation in MVA can be explained by the independent variables. Overall results conclude that in chemical industry traditional measures have value relevance during the study period. EVA although positive has no influence on MVA. Thus, NOPAT and NI should be preferred over other measure for measuring firm performance and disclosing requirements of chemical industry.

- Computer and IT industry and diversified industry have similar determinants of shareholders wealth (MVA) as observed from the Table 6.4. Return On Net worth (RONW) is negatively associated in both industries with the exception that in case of diversified industry, coefficient is statistically significant with low *p*-value (0.005). Similarly, Net Income (NI) is negatively associated with MVA in diversified sector along with statistical insignificant coefficient whereas positive and significant association in computer industry. Additionally, ROCE is statistically insignificant in computer industry whereas in diversified sector NI not only statistically significant but it also outperforms other measures having highest regression coefficient (116.11). NI has maximum influence on the MVA of diversified sector. NI is followed by NOPAT, EPS and EVA with regression coefficients 23.822, 22.852 and 6.380 respectively. The results provided by the table 6.4 about Computer and IT industry reflect that NOPAT has strong association with MVA followed by EPS, EVA and NI. Whereas, OCF and RI have negative coefficients but indicate statistically significant association with MVA. Closer examination of Adjusted R^2 witnesses big difference in terms of explanatory power of independent variables. In computer industry, it is 79.8 percent whereas in diversified industry it is 32.3 percent. Approximately, 80 percent of variations in the MVA can be explained by independent variables used in the study. EVA, EPS, NI, NOPAT, OCF and RI can be regarded as most important variables explaining MVA. In case of computer and IT industry whereas 33 percent of the variations in the MVA of diversified industry can be explained by independent variable. EVA, EPS, ROCE, RONW, NOPAT, OCF and RI can be regarded as most important variables explaining MVA.

Construction industry results depict that traditional measure i.e. NOPAT has positive and statistically significant impact on the Market Value Added during the study period 2000-2009. NI and EVA follow NOPAT in explaining the changes in the contemporaneous shareholder wealth. NI and EVA also have strong impact on MVA. Cash Flow From Operations (OCF) and Residual Income (RI) although have negative and statistically significant association with MVA. On the other hand, positive and statistically insignificant regression coefficients can be found about EPS and ROCE. RONW is neither positive nor statistically significant with MVA. Further analysis of coefficient of determination(R-square), Adjusted R-square and F- statistics conclude that good fitness of the multiple regression model as approximately 79 percent of variation in the MVA of construction industry can be explained by independent variables and EVA, NOPAT, NI, OCF and RI are most reliable predictor of MVA of the industry during the study period.

Regression results of Electronics, FMGC, Footwear, and FMCG sectors as presented in Table 6.4 exhibits that not all the independent variables included in the study are reliable predictor of changes in MVA. For example, in case of Electronics industry association of ROCE, RONW and OCF are not only statistically insignificant but also ROCW and OCF has negative coefficients. NOPAT, EVA, EPS, NI and RI have positive as well statistical significance regression coefficients. It is also found that NI is found in strong (b= 12.720) association with MVA followed by NOPAT, EPS, EVA and RI. Therefore these five measures can be regarded as important variables explaining MVA in Electronics industry. On the other hand in FMCG industry only EVA and NI have significant regression, both these measures are positively associated with contemporaneous MVA. EPS, ROCE, OCF and NOPAT all measures have positive and statistically insignificant beta coefficients implying that these cannot be regarded as reliable predictor of MVA in FMCG sector during the study period. ROCE also exhibit negative and statistically insignificant association with shareholder value. With regard to model fit, high and significant adjusted R-square (92.6 percent) can be observed for FMCG sector concluding that 92.6 percent of the variations in the MVA can be explained by eight independent variables used in the study. Therefore, high Adjusted R^2 and F-statistics fit well to the model. Only EVA and NI can produce reliable explanation in the changes in the MVA during study period.

In Gems and jewelry sector, only EVA represents significant association with MVA with regression coefficient 3.848 (t value= 1.86 and p=0.057) and all other measures having statistically insignificant association with MVA. Only NI has negative regression coefficient. Low Adjusted R^2 value of 20 percent suggests that 80 percent of the variation remained unexplained by independent variables. Only EVA can be regarded as reliable measures explaining MVA in gems and jewelry industry during 2000-2009. With regard to footwear industry, operating cash flow (OCF) is found to have positive and strong impact on MVA. NOPAT, EVA and RI with positive and statistically significant association follow Net Income (NI) in terms of explaining the changes in MVA. EPS and ROCE have negative association whereas RONW and NI have positive association with MVA. Analysis of R-square and Adjusted R- Square about footwear industry show that 53.6 percent of the changes in the MVA is predicted by selected independent variables and OCF, NOPAT, EVA and RI have emerged as most important variables explaining MVA.

Regression Coefficients of Earnings Per Share (EPS), Return on Net Worth (RONW), Return On Capital Employed (ROCE) and Net Income (NI) exhibits statistically insignificant association in machinery and metal industries. Additionally, NOPAT represents statistically insignificant association with MVA in metal industry. Negative coefficients in machinery industry are reported of EPS, RONW, ROCE and RI whereas EPS and ROCE in case of meal industry. Closer examination of coefficients show that traditional financial performance measures dominate value based measures (EVA) in explaining the changes in the shareholders wealth in machinery and metal industries. Approximately 94.1 percent and 57.1 percent of variations in the MVA of metal & machinery industries respectively can be explained by eight independent variables together as revealed by Adjusted R^2 given in the Table 6.5. Overall measures like OCF, NOPAT, EVA and RI in machinery industry and OCF, EVA and RI in metal industry can be regarded as reliable predictor of MVA during the study period.

To examine the association of MVA and eight explanatory variables in paper, pharmaceutical, plastic and power generation industries, multiple regression analysis was performed using model 6.1 and results are presented in Table 6.4 and 6.5. In paper industry, except EPS and ROCE all measures have significant value relevance. Regression coefficients of EVA, NI, RONW, NOPAT, OCF and RI are found to be positively and highly statistically significant association with MVA. Popular and mandated performance measures i.e. NOPAT is found in strong association with MVA followed by OCF, EVA, RI, NI and RONW. Hence, NOPAT, OCF, EVA, RI, NI and RONW are considered as reliable measures of shareholders wealth of paper industry during the study period.

Regression analysis of pharmaceutical industry exhibits that ROCE and RONW are statistically insignificant in explaining the changes in the MVA of the sample companies. Further, Cash Flows From Operation (OCF) and Residual Income (RI) have negative but statistically significant coefficients. NOPAT, OCF, EPS, RI and EVA are most reliable determinants of MVA during the study period as they depicted an edge over other variables in case of pharmaceutical industry. Regression coefficients and Economic Value Added (EVA) of plastic, power, and textile industries exhibit negative association with MVA as depicted by Table 6.4. Coefficients of EVA is statistically significant in textile and plastic industries whereas insignificant in power generation industry. Results of paper industry further reveal that along with EVA, coefficients of ROCE, RONW, NOPAT and OCF are not statistically significant. Only Net Income (NI), Residual Income (RI) and Earnings Per Shares (EPS) can be considered as the predictor of MVA of the paper industry. Whereas ROCE is found in strong association with MVA followed by OCF, NOPAT, EVA and RI and can be called as reliable variables that explain the changes in the MVA of power generation industry during the study period.

Coefficients of determination (R^2) of paper, pharmaceutical, plastic and power generation industries as presented in Table 6.5 depicts that 72 percent and 71 percent of variation in the MVA of paper and pharmaceutical industries respectively can be explained by these explanatory variables together. Although F-value shows the good fitness of models in all industries but plastic and power generation industries have adjusted R^2 of 27 percent and 20 percent respectively, leaving large variations of MVA unexplained by eight explanatory variables employed in the present study.

Textile industry results conclude that except ROCE and RONW, all measures can be regarded as reliable predictor of MVA. Similar to other industries examined, traditional measures like NOPAT, NI and OCF have more explanatory power as compared to EVA and Residual Income (RI). Earnings Per Share (EPS) although negative has statistical significance association with dependent variable. Transport service industry also exhibits similar results with the difference that instead of negative coefficient of EPS as reported in textile industry. EVA has negative but statistical significance association with MVA in transport service industry. NOPAT is followed by EPS, OCF, RI, NI and EVA in predicting the changes in the MVA of transport industry. In trading industry only NOPAT and EPS are having statistical significance association with MVA. All other measures cannot be considered predictor of changes in MVA of trading industry, hence cannot be included in the present model. Approximately 58 percent of the variation in the MVA of trading industry is explained by eight independent variables together.

Lastly, regression results of hotel & restaurant industry and miscellaneous industry as presented in Table 6.4 are analyzed. Examination of regression coefficients of hotel industry reveals that EVA, EPS, ROCE and NI are statistically significant associated with Market Value Added (MVA). The regression coefficients of OCF, NOPAT, RI and RONW have insignificant association with MVA. Net Income (NI) exhibits strong association with MVA followed by EPS, ROCE and EVA. However, EPS is negatively related with MVA during the study period. Coefficient of determination (R^2) in hotel industry is 0.583 imply that the changes in the MVA can be predicted by eight independent variables to the extent of fifty eight percent. The value of Adjusted R^2 (56.7 percent) and statistically significant F-value shows the good fitness of the model. On the other hand, analysis of regression coefficients of miscellaneous industry shows that all eight independent variables have positive association with MVA. Further, statistically significant association can be found between MVA and NOPAT, OCF, EVA, RI and NI. However EPS, ROCE and RONW exhibit although positive but statistically insignificant association with MVA. Similar to majority of the industries, regression coefficient of NOPAT is highest implying that strong association can be found between NOPAT and MVA followed by OCF, EVA, RI and NI. As evident from Adjusted R^2 statistics, approximately 77 percent of changes in the MVA of miscellaneous industry can be explained by independent variables during the study period 2000-2009.

From the analysis of results of multivariate regression of all industries it may be conclude that although, there exists a significant difference in the determinants of shareholder wealth in different industries, even then it can be concluded that combination of traditional measures have strong association with MVA as compared to value based measures. Net Income (NI), Net Operating Profit After Tax (NOPAT), Cash flow from Operations (OCF), Earnings Per Share (EPS) and even Residual Income (RI) in some industries outperform EVA in explaining the changes in MVA in majority of the industries during the study period. In some industries, EVA has negative and statistically insignificant association with MVA.

As summarized in Table 6.6, out of 23 industries analyzed in the present study, Return On Capital Employed (ROCE) and Return On Net worth (RONW) have insignificant association with MVA in 18 and 20 industries respectively implying that both of these cannot be regarded as predictor of MVA in sample industries. EPS follow ROCE and RONW with insignificant regression coefficients in twelve (12) sample industries. The Adjusted R^2 of all industries ranges from very low (12 percent) to very high (94 percent) supporting that there exists a significant difference in the determinants of MVA in various industries.

Table 6.6 Summary of multiple regression analysis-industry wise statistical significance

Industry	EVA	EPS	ROCE	RONW	NI	OCF	NOPAT	RI
Agriculture Products	+	-	+	-	+	+	+	+
Automobile and automobile parts	+	-	+	-	+	+	+	+
Business Consultancy	+	+	-	+	-	+	+	+
Cement	+	+	-	-	+	+	+	+
Chemical and chemical products	-	-	-	-	+	-	+	-
Computer and IT	+	+	-	-	+	+	+	+
Construction	+	-	-	-	+	+	+	+
Diversified	+	+	+	+	-	+	+	+
Electronics	+	+	-	-	+	-	+	+
FMCG	+	-	-	-	+	-	-	-
Footwear	+	-	-	-	-	+	+	+
Gems and Jewelry	+	-	-	-	-	-	-	-
Hotel and Restaurant	+	+	+	-	+	-	-	-
Machinery	+	-	-	-	-	+	+	+
Metals and Metal products	+	-	-	-	-	+	-	+
Miscellaneous	+	-	-	-	+	+	+	+
Paper	+	-	-	+	+	+	+	+
Pharmaceutical	+	+	-	-	+	+	+	+
Plastic	+	+	-	-	+	-	-	+
Power Generation	+	-	+	-	-	+	+	+
Textile	+	+	-	-	+	+	+	+
Trading	-	+	-	-	-	-	+	-
Transport Services	+	+	-	-	+	+	+	+

Note: + stands for significant association of dependent and independent variables;
– stands for insignificant association of dependent and independent variables

6.5 RELATIVE INFORMATION CONTENT TEST – UNIVARIATE REGRESSION RESULTS

6.5.1 Hypothesis IV

H4: EVA dominates conventional performance measures such as NOPAT, ROCE, ROE, and EPS etc. in explaining contemporaneous MVA in different industries.

The main objective of this hypothesis to analyze and compare the value relevance of EVA and traditional performance measures in different industries. After analyzing the determinants of Market Value Added (MVA) in different industries together, relative information content of various measures based on univariate regressions was examined in the second step. This was done in order to know the explanatory power of different performance measures in various industries and to rank these measures with an object to find out which performance measure outperforms in a specific industry. Another rationale of using this approach was to examine the difference in the ranking of different performance measures in different industries and to find out which performance measures are reliable guide to MVA in different industries. Following Biddle *et al.*, (1995) relative information content methodology, hypothesis 4 was examined using following univariate regression models in all industries:

$$MVA_{it} = b_0+b_1EVA_{it}+ e_{it} \quad \textbf{(6.2)}$$

$$MVA_{it} = b_0+b_1EPS_{it}+ e_{it} \quad \textbf{(6.3)}$$

$$MVA_{it} = b_0+b_1ROCE_{it}+ e_{it} \quad \textbf{(6.4)}$$

$$MVA_{it} = b_0+b_1RONW_{it}+ e_{it} \quad \textbf{(6.5)}$$

$$MVA_{it} = b_0+b_1NI_{it}+ e_{it} \quad \textbf{(6.6)}$$

$$MVA_{it} = b_0+b_1NOPAT_{it}+ e_{it} \quad \textbf{(6.7)}$$

$$MVA_{it} = b_0+b_1OCF_{it}+ e_{it} \quad \textbf{(6.8)}$$

$$MVA_{it} = b_0+b_1RI_{it}+ e_{it} \quad \textbf{(6.9)}$$

Where

MVA_{it} = Market Value Added for firm i in period t
EVA_{it} = Economic Value Added for firm i in period t
EPS_{it} = Earnings Per Shares for firm i in period t
$ROCE_{it}$ = Return On Capital Employed for firm i in period t
$RONW_{it}$ = Return On Net Worth for firm i in period t
OCF_{it} = Cash Flows From Operations for firm i in period t
$NOPAT_{it}$ = Net Operating Profit After Tax for firm i in period t
NI_{it} = Net Income for firm i in period t
RI_{it} = Residual Income for firm i in period t
e_{it} = Random Disturbance term
b_0 = constant term

The value-relevance of each of the variables was then assessed by comparing R- squares for above regressions in each industry. The basic objective was to determine and compare the value relevance of the variables and to find out which one out perform each others in various industries. This is done by ranking the performance measures on the basis of explanatory power of each of the performance measures- as measured by R- square in each industry. Table 6.7 presents the coefficients, *t*-value and *p*-value of above regression models for all industries. From the examination of results of regression model 6.2, it is clear that the coefficients of EVA are positive in all industries expect in metal, plastic, pharmaceutical, textile and trading industries. Further as evident from *t*-statistics of EVA, the coefficients of EVA are statistically different from zero in all industries except in case of plastic, power, gems & jewelry, business consultancy and chemical industries. The strongest association of EVA with MVA can be observed in case of FMCG industry with regression coefficient (1.4725) followed by computer &IT (0.956) and construction and paper industry with 0.289 and 0.224 respectively. The results conclude that EVA has influence on the MVA of the sample industries except in case of plastic, power, gems & jewelry, business consultancy and chemical industries.

Table 6.7 Industry wise univariate regression coefficients

Variables	Industries	Agriculture Products	Automobile and automobile parts	Business Consultancy	Cement	Chemical	Computer and IT	Construction	Diversified
EVA	Constant term b_0	143.3 (2.10) 0.036	362.49 (3.76) 0.000	39.27 (1.00) 0.321	302.3 (1.83) 0.069	-5.7 (-0.31) 0.758	-122.0 (-0.76) 0.448	147.0 (0.52) 0.602	-239.4 (-1.57) 0.120
	b_1	**0.139*** **(4.15)** **0.000**	**0.059*** **(6.75)** **0.000**	**0.015** **(0.51)** **0.611**	**0.016**** **(1.96)** **0.051**	**0.000** **(0.03)** **0.980**	**0.956*** **(49.19)** **0.000**	**0.289*** **(10.30)** **0.000**	**0.098*** **(3.46)** **0.001**
EPS	Constant term b_0	67.6 (0.99) 0.325	418.87 (4.26) 0.000	-65.53 (-3.25) 0.002	373.0 (2.36) 0.019	-6.80 (-0.40) 0.692	241.1 (0.75) 0.452	803 (2.46) 0.014	45.9 (0.29) 0.771
	b_1	**21.735*** **(6.15)** **0.000**	**7.982*** **(4.53)** **0.000**	**10.973*** **(15.52)** **0.000**	**3.727***** **(1.69)** **0.097**	**0.163** **(0.56)** **0.573**	**1.88*** **(12.26)** **0.000**	**7.629** **(1.30)** **0.194**	**3.187** **(0.46)** **0.646**
ROCE	Constant term b_0	141.2 (2.25) 0.025	483.868 (4.95) 0.000	1.38 (0.04) 0.968	392 (2.52) 0.013	-10.2 (-0.60) 0.551	1263 (3.80) 0.000	936 (3.01) 0.003	-207.8 (-1.41) 0.160
	b_1	**13.139*** **(7.20)** **0.000**	**7.175*** **(2.85)** **0.005**	**10.744*** **(4.53)** **0.000**	**9.353**** **(2.34)** **0.020**	**1.32***** **(1.86)** **0.063**	**58.63*** **(5.20)** **0.000**	**-0.034** **(-0.12)** **0.903**	**40.36*** **(3.46)** **0.001**
RONW	Constant term b_0	200.44 (3.12) 0.002	537 (5.55) 0.000	6.78 (0.18) 0.856	413 (2.62) 0.009	-5.6 (-0.33) 0.742	1596.1 (4.83) 0.000	9.03 (2.85) 0.005	-149.2 (-0.94) 0.350
	b_1	**5.50*** **(4.62)** **0.000**	**0.1378** **(0.53)** **0.595**	**6.144*** **(3.15)** **0.002**	**0.417*** **(0.68)** **0.009**	**0.103** **(0.68)** **0.497**	**10.478**** **(2.21)** **0.028**	**1.55** **(0.51)** **0.613**	**22.228**** **(2.37)** **0.020**

Table 6.7 Industry wise univariate regression coefficients (contd.)

Variables	Industries	Agriculture Products	Automobile and automobile parts	Business Consultancy	Cement	Chemical	Computer and IT	Construction	Diversified
NI	Constant term b_0	-100.29 (-2.14) 0.033	-11.62 (-0.24) 0.811	-35.36 (-1.11) 0.269	-281 (-3.40) 0.001	-47.2 (-2.81) 0.005	303 (1.90) 0.058	-220 (-1.36) 0.175	-87.4 (-0.65) 0.516
	b_1	**15.528*** **(21.96)** **0.000**	**8.985*** **(41.28)** **0.000**	**8.768*** **(6.82)** **0.000**	**7.10*** **(24.69)** **0.000**	**3.05*** **(8.37)** **0.000**	**18.80*** **(48.70)** **0.000**	**18.60*** **(31.12)** **0.000**	**3.458*** **(3.04)** **0.003**
OCF	Constant term b_0	104.0 (1.82) 0.070	169.61** (2.17) 0.031	-11.38 (-0.30) 0.768	-611 (-6.20) 0.000	-29.9 (-4.59) 0.003	417** (2.02) 0.044	863 (2.79) 0.006	-183.7 (-1.16) 0.248
	b_1	**6.570*** **(11.81)** **0.000**	**3.80*** **(18.17)** **0.000**	**3.983*** **(3.33)** **0.001**	**6.434*** **(21.42)** **0.000**	**1.070*** **(2.94)** **0.003**	**21.94*** **(33.60)** **0.000**	**2.14**** **(2.31)** **0.021**	**3.380**** **(2.71)** **0.008**
NOPAT	Constant term b_0	-173.0 (-3.60) 0.000	-113.97 (-2.23) 0.026	-24.64 (-0.67) 0.506	-485.0 (-5.21) 0.000	-46.9 (-2.59) 0.010	201.0 (1.18) 0.237	-401.0 (-2.43) 0.016	-254.5 (-1.76) 0.082
	b_1	**16.573*** **(21.93)** **0.000**	**10.044*** **(39.37)** **0.000**	**6.497*** **(4.32)** **0.000**	**8.18*** **(22.18)** **0.000**	**2.406*** **(5.67)** **0.000**	**26.472*** **(48.01)** **0.000**	**20.3*** **(30.72)** **0.000**	**5.127*** **(4.04)** **0.000**
RI	Constant term b_0	138.0 (2.02) 0.044	352.90 (3.67) 0.000	39.36 (1.00) 0.321	297 (1.80) 0.074	-5.01 (-0.27) 0.786	-123.6 (-0.76) 0.447	233 (0.81) 0.420	-237.1 (-1.55) 0.125
	b_1	**-0.147*** **(-4.39)** **0.000**	**-0.061*** **(-7.04)** **0.000**	**-0.015** **(-0.50)** **0.619**	**-0.017**** **(-2.01)** **0.045**	**0.000** **(0.07)** **0.947**	**-0.953*** **(-48.53)** **0.000**	**-0.263*** **(-9.26)** **0.000**	**-0.092*** **(-3.41)** **0.001**

Table 6.7 Industry wise univariate regression coefficients (contd.)

Variables	Industries	Electronics	FMCG	Footwear	Gems and Jewelry	Hotel and Restaurant	Machinery	Metals	Miscellaneous
EVA	Constant term b_0	3.42 (0.09) 0.925	309 (0.23) 0.815	-48.8 (-1.52) 0.133	42.3 (0.72) 0.472	-70.8 (-1.37) 0.172	-27.8 (-1.51) 0.132	-65.42 (-0.75) 0.454	25.8 (0.09) 0.931
	b_1	**0.115*** **(11.23)** **0.000**	**1.472*** **(7.49)** **0.000**	**0.202*** **(3.91)** **0.000**	**0.0291** **(1.12)** **0.265**	**0.102*** **(8.79)** **0.000**	**0.162*** **(13.57)** **0.000**	**-0.145*** **(-16.04)** **0.000**	**0.169*** **(28.71)** **0.000**
EPS	Constant term b_0	20.72 (0.57) 0.571	5658* (2.99) 0.004	43.3 (1.35) 0.183	-75.84 (-1.21) 0.229	-14.91 (-0.22) 0.829	53.69* (2.70) 0.007	79.0 (0.68) 0.497	-1441.1* (-3.78) 0.000
	b_1	**19.096*** **(10.88)** **0.000**	**-1.90** **(-0.02)** **0.984**	**0.165** **(0.05)** **0.961**	**15.429*** **(3.94)** **0.000**	**14.554**** **(2.26)** **0.025**	**1.442*** **(5.53)** **0.000**	**15.371*** **(6.00)** **0.000**	**317.11*** **(17.79)** **0.000**
ROCE	Constant term b_0	104.30 (2.55) 0.011	-1221 (0.77) 0.441	36.9 (1.48) 0.142	69.82 (1.31) 0.193	-3.9 (-0.06) 0.953	73.93 (3.66) 0.000	119.3 (1.05) 0.294	1881.1 (5.03) 0.000
	b_1	**0.205** **(0.70)** **0.482**	**274.49*** **(6.47)** **0.000**	**1.152** **(0.86)** **0.394**	**0.016** **(0.13)** **0.895**	**13.409**** **(2.23)** **0.027**	**0.516** **(1.62)** **0.105**	**32.945*** **(6.30)** **0.000**	**0.908** **(0.62)** **0.533**
RONW	Constant term b_0	101.0 (2.44) 0.015	-1632 (-0.99) 0.341	37.62 (1.47) 0.146	54.9 (1.00) 0.318	59.8 (0.97) 0.332	69.15 (3.39) 0.001	241.6 (2.05) 0.041	1761.5 (4.66) 0.000
	b_1	**0.105** **(0.35)** **0.727**	**261.18*** **(6.18)** **0.000**	**0.776** **(0.55)** **0.582**	**1.230** **(1.12)** **0.265**	**0.933** **(0.59)** **0.557**	**0.966**** **(2.13)** **0.034**	**5.975*** **(2.55)** **0.011**	**14.182**** **(1.96)** **0.050**

Table 6.7 Industry wise univariate regression coefficients (contd.)

Variables	Industries	Electronics	FMCG	Footwear	Gems and Jewelry	Hotel and Restaurant	Machinery	Metals	Miscellaneous
NI	Constant term b_0	-15.76 (-0.63) 0.532	-445.7 (-0.94) 0.348	-15.6 (-0.68) 0.496	0.57 (0.01) 0.991	-162.0 (-3.54) 0.001	-13.9 (-0.91) 0.362	-42.71 (-1.09) 0.275	-337.8 (-1.62) 0.106
	b_1	**6.878*** **(25.23)** **0.000**	**25.077 *** **(29.76)** **0.000**	**8.468*** **(5.66)** **0.000**	**6.011*** **(5.66)** **0.000**	**9.33*** **(12.86)** **0.000**	**7.02*** **(19.36)** **0.000**	**4.08*** **(47.64)** **0.000**	**6.028*** **(52.88)** **0.000**
OCF	Constant term b_0	-36.78 (-1.13) 0.259	-1238.0 (-2.39) 0.019	-11.3 (-0.45) 0.656	58.83 (1.11) 0.271	-161.0* (-3.18) 0.002	76.42* (3.73) 0.000	-84.6 (-1.81) 0.071	-166.2 (-0.67) 0.506
	b_1	**5.926*** **(16.07)** **0.000**	**28.898*** **(27.70)** **0.000**	**6.271*** **(4.19)** **0.000**	**0.395** **(1.62)** **0.108**	**5.98*** **(10.63)** **0.000**	**0.039** **(0.14)** **0.889**	**4.27*** **(39.09)** **0.000**	**4.113*** **(39.96)** **0.000**
NOPAT	Constant term b_0	-69.6 (-3.08) 0.002	-678.3 (-1.37) 0.174	-44.2 (-1.82) 0.073	-70.6 (-1.34) 0.181	-164.0 (-3.40) 0.001	-47.7 (-3.24) 0.001	-92.72 (-2.52) 0.012	-412.0 (-1.81) 0.071
	b_1	**8.6158*** **(30.29)** **0.000**	**32.157*** **(28.48)** **0.000**	**11.713*** **(6.17)** **0.000**	7.846* (6.23) 0.000	7.99* (11.72) 0.000	**8.684*** **(21.89)** **0.000**	**4.868*** **(51.14)** **0.000**	**6.298*** **(46.59)** **0.000**
RI	Constant term b_0	2.50 (0.07) 0.945	272.0 (0.21) 0.837	-46.6 (-1.45) 0.151	36.7 (0.62) 0.535	-73.1 (-1.42) 0.158	-31.1 (-1.67) 0.096	-64.25 (-0.73) 0.464	11.9 (0.04) 0.968
	b_1	**-0.115*** **(-11.17)** **0.000**	**-1.453*** **(-7.50)** **0.000**	**-0.195*** **(-3.83)** **0.000**	**-0.033** **(-1.28)** **0.202**	**-0.102*** **(-8.84)** **0.000**	**-0.169*** **(-13.32)** **0.000**	**-0.143*** **(-15.94)** **0.000**	**-0.166*** **(-28.45)** **0.000**

Table 6.7 Industry wise univariate regression coefficients (contd.)

Variables \ Industries		Paper	Pharmaceutical	Plastic	Power Generation	Textile	Trading	Transport Services
EVA	Constant term b_0	-235.0 (-3.21) 0.001	78.6 (1.27) 0.206	-39.9 (-4.15) 0.000	787.3 (2.70) 0.008	-143.0 (-4.79) 0.000	54.37 (1.39) 0.165	-216.41 (-2.62) 0.010
	b_1	**0.224*** **(15.36)** **0.000**	**-0.446*** **(-26.70)** **0.000**	**-0.001** **(-0.79)** **0.431**	**0.006** **(0.75)** **0.453**	**-0.039*** **(-7.90)** **0.000**	**-0.057*** **(-7.88)** **0.000**	**0.057*** **(7.06)** **0.000**
EPS	Constant term b_0	145.0 (1.56) 0.119	231.0 (2.42) 0.016	-36.497 (-3.80) 0.000	516.3 (1.78) 0.076	-189.0 (-6.88) 0.000	72.37 (1.69) 0.092	-403.0 (-4.22) 0.000
	b_1	**0.906** **(1.10)** **0.272**	**36.70*** **(8.06)** **0.000**	**-0.974** **(-1.15)** **0.250**	**12.08**** **(1.98)** **0.048**	**20.946*** **(15.34)** **0.000**	**8.842*** **(3.12)** **0.002**	**7.226***** **(1.75)** **0.082**
ROCE	Constant term b_0	155.94 (1.68) 0.093	531.53* (6.17) 0.000	-38.5* (-4.07) 0.000	-79.4 (-0.26) 0.792	-86.86* (-2.89) 0.004	101.11* (2.42) 0.016	-456.0* (-5.29) 0.000
	b_1	**0.243** **(0.24)** **0.811**	**15.4*** **(4.57)** **0.000**	**0.005** **(0.24)** **0.810**	**83.98*** **(5.04)** **0.000**	**0.100** **(0.31)** **0.755**	**2.426** **(1.46)** **0.144**	**7.137**** **(1.96)** **0.053**
RONW	Constant term b_0	155.43 (1.68) 0.094	673.0* (8.30) 0.000	-38.788* (-4.09) 0.000	505.0 (1.75) 0.082	-87.56* (-2.91) 0.004	105.29* (2.54) 0.011	-468* (-5.35) 0.000
	b_1	**0.0254** **(0.13)** **0.901**	**0.622** **(1.09)** **0.278**	**0.035** **(0.56)** **0.577**	**16.93** **(2.03)** **0.44**	**0.403** **(0.76)** **0.448**	**1.793** **(1.60)** **0.111**	**-1.22** **(-0.81)** **0.422**

Table 6.7 Industry wise univariate regression coefficients (contd.)

Variables	Industries	Paper	Pharmaceutical	Plastic	Power Generation	Textile	Trading	Transport Services
NI	Constant term b_0	-124 (-1.50) 0.135	83.5 (1.53) 0.126	-44.3* (-4.66) 0.000	-7.40 (-0.03) 0.980	-171.95* (-7.85) 0.000	-13.6 (-0.41) 0.682	-266.0* (-3.20) 0.002
	b_1	**17.935*** **(10.64)** **0.000**	**13.04*** **(33.17)** **0.000**	**1.314*** **(3.60)** **0.000**	**4.948*** **(5.16)** **0.000**	**4.992*** **(28.45)** **0.000**	**11.378*** **(15.90)** **0.000**	**-1.66*** **(-6.30)** **0.000**
OCF	Constant term b_0	82.0 (0.81) 0.418	206.0* (3.01) 0.003	-5.8 (-0.58) 0.564	630.1** (2.06) 0.041	-210.59* (-8.07) 0.000	88.15* (2.53) 0.012	-166** (-2.02) 0.046
	b_1	**2.886***** **(1.78)** **0.076**	**14.55*** **(20.84)** **0.000**	**2.014*** **(7.62)** **0.000**	**0.359** **(0.58)** **0.566**	**3.352*** **(19.06)** **0.000**	**4.457*** **(12.42)** **0.000**	**1.69*** **(7.74)** **0.000**
NOPAT	Constant term b_0	-132.30 (-1.43) 0.154	-7.01 (-0.12) 0.901	-43.79* (-4.25) 0.000	74.0 (0.24) 0.811	-207.0* (-8.49) 0.000	-52.13* (-1.73) 0.084	-186** (-2.28) 0.024
	b_1	**14.419*** **(7.58)** **0.000**	**16.81*** **(32.19)** **0.000**	**0.5321** **(1.32)** **0.189**	**4.174*** **(3.91)** **0.000**	**4.698*** **(22.91)** **0.000**	**11.476*** **(19.93)** **0.000**	**-2.69*** **(-7.58)** **0.000**
RI	Constant term b_0	-234.26* (-3.17) 0.002	76.5 (1.23) 0.219	-39.767* (-4.14) 0.000	792.5* (2.71) 0.007	-143.61* (-4.80) 0.000	54.3 (1.39) 0.164	-210.0* (-2.55) 0.012
	b_1	**-0.221*** **(-15.08)** **0.000**	**-0.446*** **(-26.69)** **0.000**	**-0.001** **(-0.68)** **0.495**	**0.006** **(0.80)** **0.427**	**-0.038*** **(-7.89)** **0.000**	**-0.058*** **(-8.05)** **0.000**	**0.057*** **(7.18)** **0.000**

Notes:

1. In each Colum, regression coefficients are given first, followed by t- values in parentheses and p-values at the last.
2. *, ** and *** are statistically significant at $p \leq 0.01$, $p \leq 0.05$ and $p \leq 0.10$ respectively.

Results of regression equation 6.3 as presented in the Table 6.7 indicates that except in Cement, Chemical, construction, diversified, Footwear, FMCG, Paper and Plastic industries coefficients of EPS are statistically significant at given level of significance. Further, the coefficients of EPS in FMCG and plastic are negatively associated with MVA. Among positive coefficients miscellaneous industry has highest and strongest association of earnings per share (EPS) with MVA. Pharmaceutical and Agriculture products follow Miscellaneous with statistically significant EPS coefficients of 36.70 and 21.735 respectively for pharmaceutical and agriculture products.

Regression results of univariate model of Return On Capital Employed (ROCE) states that agriculture products, automobile and automobile parts, business consultancy, cement, chemical, computer and IT, diversified, FMCG, hotel and restaurant, metal, miscellaneous, pharmaceutical, power and transport services industries have positive and statistically significant relationship with shareholders wealth (MVA).Negative and statistically insignificant association of ROCE with MVA can be observed in construction industry. Industries like electronics, footwear, gems & jewelry, machinery, miscellaneous, paper, textile and trading although have positive but statistically insignificant association with MVA implying that ROCE cannot be considered as reliable predictor of MVA in these industries.

Closer examination of regression coefficients about all industries state that ROCE has strongest and statistically significant association with MVA in FMCG industry followed by power, diversified and metal industries. The overall results conclude that ROCE can be considered as reliable measures of changes in the MVA of agriculture products, automobile and automobile parts, business consultancy, cement, chemical, computer and IT, diversified, FMCG, hotel and restaurant, metal, miscellaneous, pharmaceutical, power and transport services industries during the period of investigation between 2000-2009. Examination of results regarding all industries about model 6.5 indicates that out of 23 industries analyzed in the present study, the coefficients is statistically insignificant in 13 industries suggesting that RONW is not a reliable measure of changes in the firm value in majority of the industries. Table 6.7 further reveals that negative association of RONW with dependent variable i.e. MVA can be observed in transport service industry. Similar to ROCE, positive, statistically significant and strongest (261.18) association of RONW can be found in FMCG industry followed by diversified, miscellaneous, business consultancy and agriculture with positive and statistically significant association of RONW with

MVA in all industries. Overall results conclude that during the study period 2000-2009, RONW is not a reliable predictor in majority of the industries.

In order to examine the appropriateness of Net Income (NI) in explaining the changes in the contemporaneous MVA of different industries, regression model 6.6 was applied and results are presented in Table 6.7. It is worth noting from the results of regression coefficients that Net Income (NI) can be regarded as reliable predictor of MVA as the NI regression coefficients in all industries are highly statistically significant at 1 percent level. Further, except transport service industry NI has positive association with changes in Market Value Added (MVA). Closer examination of association between NI and MVA, it was found that similar to ROCE and RONW, FMCG industry outperform others. Computer & IT, paper and agriculture products industries follow FMCG industry all with positive and statistical significant association with MVA.

Similar to the results of Net Income (NI), NOPAT also exhibits positive association with changes in the Market Value Added (MVA) in all industries except in transport service industry. NOPAT in plastic industry exhibits statistical insignificance association whereas significant association in case of Net Income (NI) measures. Regression coefficient of NOPAT has negative but statistical significance association with dependent variable. Here again for FMCG industry NOPAT has strongest association with MVA followed by Computer & IT , construction, pharmaceutical and agriculture industries . Overall results of regression model 6.7 conclude that NOPAT is a reliable measure of changes in the MVA of the sample industries.

Table 6.7 further presents the results of regression models 6.8 and 6.9. Regression model 6.8 examines the association of OCF with contemporaneous MVA whereas model 6.9 analyzes the relationship of Residual Income (RI) with changes in the MVA during the study period 2000-2009. Results about model 6.8 indicates that regression coefficients of Cash Flow From Operations (OCF) have positive association with changes in the Market Value (MVA) as revealed by signs of regression coefficients . T-value as given in the parentheses related to OCF show that except Gems and jewelry and power generation industries, the coefficients are statistically significant indicating OCF and it is a reliable measure of predicting MVA in sample industries. It is worth noting that FMCG industry here too outperforms others in explaining the changes of MVA with OCF. Contrary to the results of measures analyzed above, regression coefficients of Residual Income exhibits negative association with MVA. Coefficients of RI in business consultancy, chemical, gems & jewelry and plastic industries as reported in table are not only negative but have statistically insignificant association with MVA. Positive but statistically insignificant relationship can be observed in power industry. This suggests that RI is not a reliable predicator of MVA in business consultancy, chemical, gems & jewelry and plastic and power industries. Negative association of RI in majority of industry also indicate that most of the industries are unable to create value for their shareholders as their returns are not sufficient to cover the real cost of fund employed.

Table 6.8 presents the industry wise results of relative information content of all measures. As discussed earlier, using standard methodology given by Biddle *et al.* (1995), all eight measures are analyzed on the basis of their explanatory power (adjusted R^2). The results are presented in the Table on the basis of decreasing order of Adjusted R^2 i.e. the measures having maximum explanatory power is presented first followed by others in same order. It is clear from the results that there is significant difference in the explanatory power of performance measures across all industries. One can observe that traditional performance measures outperform EVA in majority of the industries. It is evident that out of 23 industries, traditional measures outscore in 21 industries and EVA in 02 industries only. Results of industry wise relative information content test are consistent with aggregate results presented in the last chapter. Examination of Adjusted R^2 shows that NI exhibits highest explanatory power in FMCG industry followed by NOPAT in metal industry. Regression coefficients as given in Table 6.7 also conclude that strongest association of traditional measures in FMCG industry.

In agriculture industry, NI has highest explanatory power. Relative information content test reveals that 54.1 percent of changes in the Market Value (MVA) can be explained by Net Income (NI). NOPAT and OCF follow NI with 54.0 percent and 25.4 percent Adjusted R^2 value respectively. There is not much difference in the explanatory power of NI and NOPAT. EVA has lowest explanatory power as it can only explain 3.8 percent changes in the MVA. Similarly in automobile, cement, chemical, construction, power, FMCG, hotels & restaurant, miscellaneous, pharmaceutical and textile industries, Net Income (NI) outperforms other traditional and value based measures in explaining the changes in contemporaneous MVA during the study period.

On the other hand, NOPAT outperforms others measures in diversified, electronics, footwear, gems and jewelry, machinery, metal and metal products and trading industries.

Economic Value Added (EVA) outperform traditional measures in computer & IT and paper industries with 77.7 percent and 44.7 percent Adjusted R^2 value. Further EVA has no value relevance in industries like business consultancy, chemical, power generation and miscellaneous as the Adjusted R- square is zero percent suggesting that traditional performance measures are better predicator of MVA in these industries.

Overall results of relative information contents reveal that there is a significant difference in the value relevance of various performance measures in different industries. Further, traditional performance measures outperforming value based measures are better predictor of changes in the shareholders wealth in almost all the industries. Among traditional measures, Net Income (NI) and Net Operating Profit After Tax (NOPAT) are two leading performance measures in sample industries during the study period. Further ROCE and RONW also have very low contribution in explaining the MVA of the most of the sample industries. Results of relative information about ROCE and RONW are consistent with multivariate regression examined in the earlier section of the chapter, where ROCE and RONW reported insignificant association with MVA.

Table 6.9 presents the comparative ranking of various performance measures on the basis of their information content analyzed using univariate regression models of twenty three sample industries. It is evident from the table that Net Income (NI), Net Operating Profit After Tax (NOPAT) and Cash Flow From Operations (OCF) are the top three measures that dominates in the sample industries in explaining the changes in the MVA. NI has been ranked 1st in 11 industries as compared to NOPAT in 07 industries. Net Operating Profit After Tax (NOPAT) mandating corporate performance measures occupies second place as it has been placed 2nd in 12 industries and finally OCF is at third place with 12 industries reporting it as important measures in explaining MVA during the study period.

Table 6.8 Relative information content test - rank order of R^2 for all industries

Industry	Variables and Ranking														
Agriculture Products	NI		NOPAT		OCF		ROCE		EPS		RONW		RI		EVA
	54.1%	>	54.0%	>	25.4%	>	11.1%	>	8.3%	>	4.7%	>	4.3%	>	3.8%
Automobile	NI		NOPAT		OCF		RI		EVA		EPS		ROCE		RONW
	76.6%	>	74.9%	>	38.8%	>	8.5%	>	7.9%	>	3.6%	>	1.3%	>	0.00%
Business Consultancy	EPS		NI		ROCE		NOPAT		OCF		RONW		EVA		RI
	72.9%	>	33.8%	>	18.2%	>	16.5%	>	11.2%	>	9.2%	>	0.00%	>	0.00%
Cement	NI		NOPAT		OCF		ROCE		RI		EVA		EPS		RONW
	75.5%	>	71.4%	>	69.9%	>	2.2%	>	1.5%	>	1.4%	>	0.8%	>	0.00%
Chemical	NI		NOPAT		OCF		ROCE		EPS		EVA		RONW		RI
	10.5%	>	5.1%	>	1.3%	>	0.4%	>	0.00%	>	0.00%	>	0.00%	>	0.00%
Computer and IT	EVA		NOPAT		NI		RI		OCF		EPS		ROCE		RONW
	77.7%	>	77.4%	>	77.2%	>	77.2%	>	61.7%	>	17.6%	>	3.6%	>	0.6%
Construction	NI		NOPAT		EVA		RI		OCF		EPS		ROCE		RONW
	74.1%	>	61.81%	>	23.7%	>	20.0%	>	1.3%	>	0.2%	>	0.0%	>	0.0%
Diversified	NOPAT		EVA		ROCE		RI		NI		OCF		RONW		EPS
	13.4%	>	10.0%	>	10.0%	>	9.7%	>	7.7%	>	6.0%	>	4.5%	>	0.0%
Power Generation	NI		ROCE		NOPAT		RONW		EPS		EVA		OCF		RI
	11.9%	>	11.4%	>	7.0%	>	1.6%	>	1.4%	>	0.0%	>	0.0%	>	0.0%
Electronics	NOPAT		NI		OCF		EVA		RI		EPS		ROCE		RONW
	71.3%	>	63.3%	>	41.1%	>	25.4%	>	25.2%	>	24.3%	>	0.0%	>	0.0%
FMCG	NI		NOPAT		OCF		RI		EVA		ROCE		RONW		EPS
	91.0%	>	90.2%	>	89.7%	>	38.6%	>	38.5%	>	31.7%	>	30.7%	>	0.0%
Footwear	NOPAT		NI		OCF		EVA		RI		EPS		ROCE		RONW
	31.9%	>	28.2%	>	17.3%	>	15.3%	>	14.7%	>	0.0%	>	0.0%	>	0.0%
Gems & Jewelry	NOPAT		NI		EPS		OCF		RI		EVA		RONW		ROCE
	20.2%	>	17.2%	>	8.9%	>	1.1%	>	0.4%	>	0.2%	>	0.2%	>	0.0%
Hotels & Restaurant	NI		NOPAT		OCF		RI		EVA		EPS		ROCE		RONW
	49.3%	>	44.7%	>	39.9%	>	31.3%	>	31.1%	>	2.4%	>	2.3%	>	0.0%
Machinery	NOPAT		NI		EVA		RI		EPS		RONW		ROCE		OCF
	54.6%	>	48.4%	>	31.5%	>	30.7%	>	6.9%	>	0.9%	>	0.4%	>	0.0%

Table 6.8 Relative information content test - rank order of R^2 for all industries (contd.)

Industry	Variables and Ranking														
Metal and Metal products	NOPAT		NI		OCF		EVA		RI		ROCE		EPS		RONW
	90.7%	>	89.4%	>	85.0%	>	48.8%	>	48.5%	>	12.6%	>	11.5%	>	2.0%
Miscellaneous	NI		NOPAT		OCF		RI		EPS		RONW		ROCE		EVA
	69.8%	>	64.3%	>	56.9%	>	40.1%	>	39.6%	>	20.8%	>	0.2%	>	0.0%
Paper	EVA		RI		NI		NOPAT		OCF		EPS		ROCE		RONW
	44.7%	>	43.7%	>	27.8%	>	16.2%	>	0.7%	>	0.1%	>	0.0%	>	0.0%
Pharmaceutical	NI		NOPAT		EVA		RI		OCF		EPS		ROCE		RONW
	59.5%	>	58.1%	>	48.8%	>	48.8%	>	36.7%	>	7.9%	>	2.6%	>	0.0%
Plastic	OCF		NI		EPS		NOPAT		EVA		ROCE		RONW		RI
	8.4%	>	1.9%	>	0.1%	>	0.1%	>	0.0%	>	0.0%	>	0.0%	>	0.0%
Textile	NI		NOPAT		OCF		EPS		EVA		RI		ROCE		RONW
	47.7%	>	37.1%	>	29.0%	>	20.9%	>	6.5%	>	6.5%	>	0.0%	>	0.0%
Trading	NOPAT		NI		OCF		RI		EVA		EPS		RONW		ROCE
	50.5%	>	39.3%	>	28.3%	>	14.2%	>	13.6%	>	2.2%	>	0.4%	>	0.3%
Transport Services	OCF		NOPAT		RI		EVA		NI		ROCE		EPS		RONW
	31.4%	>	31.0%	>	28.1%	>	27.4%	>	23.1%	>	2.1%	>	1.6%	>	0.0%

Table 6.9 Comparative ranking of various performance measures

Variable	Rank Distribution on the basis of Adjusted R- Square		
	I^st^	**II^nd^**	**III^rd^**
NOPAT	Trading, Metal and Metal products, Machinery, Gems & Jewelry, Footwear, Electronics, Diversified **Total: 07**	Transport, Textile, Pharmaceutical, Miscellaneous, Hotels & Restaurant, FMCG, Construction, Computer and IT, Chemical, Cement, Automobile, Agriculture **Total: 12**	Power Generation **Total: 01**
NI	Textile, Pharmaceutical, Miscellaneous, Hotels & Restaurant, FMCG, Power Generation, Construction, Chemical, Cement, Automobile, Agriculture **Total: 11**	Trading, Plastic, Metal and Metal products, Machinery, Gems & Jewelry, Footwear, Electronics, Business Consultancy **Total: 08**	Paper, Computer and IT **Total: 02**
OCF	Transport, Plastic **Total: 02**	**Nil**	Trading, Textile, Miscellaneous, Metal and Metal products, Hotels & Restaurant, Footwear, FMCG, Electronics, Chemical, Cement, Automobile, Agriculture **Total: 12**
RI	**Nil**	Paper **Total: 01**	Transport **Total: 01**
EVA	Paper, Computer and IT **Total: 02**	Diversified **Total: 01**	Pharmaceutical, Machinery, Construction **Total: 03**
RONW	**Nil**	**Nil**	**Nil**
ROCE	**Nil**	Power Generation **Total: 01**	Diversified, Business Consultancy **Total: 02**
EPS	Business Consultancy **Total: 01**	**Nil**	Plastic, Gems & Jewelry **Total: 02**
Overall Ranking	**NI**	**NOPAT**	**OCF**

It can be concluded from the results of industry wise analysis and ranking of various performance measures that traditional measures are better predictor of firm value as compared to value based measures. The results of the present study fail to support the hypothesis 4 as EVA although exhibit significant association with MVA but underperform traditional measures in explaining the MVA in majority of the sample industries. The results of disaggregate approach similar to aggregate approach also suggest that although EVA has significant and positive association with MVA in majority of industries but it does not outperform traditional measures in explaining the changes in contemporaneous MVA. Thus, overall results refute the claim of EVA superiority in explaining the MVA as compared to traditional measures.

6.6 CONCLUSION

In chapter 5 empirical results based on aggregate approach are presented. After analyzing the efficacy of various performance measures on aggregate basis, industry wise analysis based on disaggregate approach was performed and presented in this chapter. To achieve this, industry wise analysis is performed to know in-depth behavior of various performance measures in different industries. It is important to highlight here that, the objective of the present thesis is not to explain the determinants of MVA, but only to show how well value based and traditional financial performance measures acts as an explanatory variables for MVA. Which value based and traditional performance measure outperforms others in explaining the MVA of Indian companies has also been investigated with priority.

The results of the disaggregate approach used in this chapter imply some significant conclusions. Following interpretations emerge from the analysis and comparison of "*Industry wise determinants*" of various performance measures and their "*relative information content*".

- Average Market Value Added (MVA) values of 23 sample industries as presented in Table 6.2 reveals that industries except companies operating in chemical and chemical products and textile industries have created value for its shareholders. Only companies in textile, chemical and chemical products industries have negative MVA value, implying that they have destroyed value of shareholders during the period of the study. Analysis of industry wise mean value of MVA further reveals that FMCG industry is the largest (Rs.5063.23 crore) value creator, followed by companies operating in miscellaneous, computer and IT, construction and power sector with mean MVA value of Rs 1754.32, 1388.75, Rs 905.01

and Rs 638.64 crore respectively. Whereas, textile has lowest mean MVA (-97.8 crore) followed by chemical and plastic sector with a mean MVA of Rs. -4.91 crore and Rs. 2.51 crore respectively.

- Industry wise average EVA figures as given in the Table 6.2 display that out of 23 sectors, FMCG, footwear, chemical and chemical products and construction are not able to earn more than the Cost of Capital, implying decrease in the value for the shareholders. Among the value creators, trading, power generation, miscellaneous, cement and transport are at the top when compared with other industries with positive EVA figures of Rs. 18982 crore, Rs. 10980.01 crore, Rs. 10719.39 crore, Rs.6477.83 and Rs. 4551.63 crore respectively.
- Results of correlation statistics about all industries conclude that in majority of industries Net Operating Profit After Tax (NOPAT), Net Income (NI) and Cash Flow From Operations (OCF) are highly correlated with Market Value Added (MVA). Economic Value Added (EVA) although positively associated with MVA in all industries outperform ROCE, RONW, EPS in 18 sectors out of 23 but underperform NI, NOPAT and OCF in majority of the cases. The correlation statistics refute the claim of EVA proponents about its superiority in terms of association with MVA. It leads to conclusion that traditional performance measures are better associated with MVA in the sample industries.
- From the analysis of results of Multivariate Regression Model 6.1 about all industries, it is clear that although, there exists a significant difference in the determinants of shareholder wealth in different industries, still it can be concluded that combination of traditional measures have strong association with MVA as compared to value based measures. Net Income (NI), Net Operating Profit After Tax (NOPAT), Cash Flow From Operations (OCF), Earnings Per Share (EPS) and even Residual Income (RI) in some industries outperform EVA in explaining the changes in MVA in majority of the industries during the study period. In some industries, EVA has negative and statistical insignificant association with MVA.
- As summarized in Table 6.6, out of 23 industries analyzed in the present study, Return On Capital Employed (ROCE) and Return On Net worth (RONW) have insignificant association with MVA in 18 and 20 industries respectively implying that both of these cannot be regarded as predictor of MVA in sample industries. EPS follow ROCE and RONW with insignificant regression coefficients in 12 industries. The Adjusted R^2 of all

industries ranges from very low (12 percent) to very high (94 percent) supporting that there exists a significant difference in the determinants of MVA in various industries.

- Comparative ranking of various performance measures was done on the basis of their information content analyzed using Univariate Regression Models 6.2-6.8 of twenty three sample industries. It can be advocated from the results of *Relative Information Content Test* of various performance measures that Net Income (NI), Net Operating Profit After Tax (NOPAT) and Cash Flow From Operations (OCF) are ***top three*** measures that dominates in the sample industries in explaining the changes in the MVA. Net Income (NI) has been ranked First in 11 industries as compared to NOPAT in 07 industries. Net Operating Profit After Tax (NOPAT) mandated corporate performance measures occupies second place as it has been placed Second in 12 industries and finally Cash Flow From Operations (OCF) is at Third place with 12 industries reporting it as important measures in explaining MVA during the study period. These results resembles with the results of multivariate regression mode analyzed in section 6.4 of the chapter.
- The results of disaggregate approach used in this chapter are similar to aggregate approach used in last chapter. It also suggests that although EVA has significant and positive association with MVA in majority of industries but it does not outperform traditional measures in explaining the changes in contemporaneous MVA. Thus, overall results refute the claim of EVA superiority in explaining the MVA as compared to traditional measures.

Notes

1. Researcher came across few studies conducted on efficacy of conventional and value based performance measures in specific industry. For example, Milunovich, & Tsuei, (1996) analyze the EVA in US computer Industry. Kim 2006, Kim & Lee, 2009 examine the appropriateness of EVA and traditional measures in US hospitality companies. Tong *et al.*,(2010) examine the value relevance of EVA in Chinese Logistic industry. Ghanbari and Sarlak (2006) examined the appropriateness of EVA in Automobile companies in Indian market. Otherwise, there was dearth of studies which can provide some insight on effectiveness of various financial performance measures in explaining contemporaneous MVA at industry level.

CHAPTER 7
SUMMARY, CONCLUSIONS & SUGGESTIONS

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7.1 INTRODUCTION

During the last two decades, a remarkable change has occurred in the way corporations are run or operate. Globalization, technological advancement, ownership concentration, accountability, the information revolution including the internet, as well as the ever increasing complexity of the financial markets have become the primary forces behind the transformation of corporations and the climate in which they operate. Companies around the globe are under great pressure not only to adapt to this new climate, but also to perform consistently well in all markets in which they compete. If companies fail to perform, they will either be forced to go bankrupt or will have to face the threat of being taken over by the competitors as happened recently in many advanced markets like USA and Europe. Today, academics, researchers, business professionals, and stock market analysts widely agree that maximizing shareholder value is the most central financial objective of a business organization. However, usually divergent opinions exist as to how this value can be identified, measured, and ultimately optimized.

There are various methods to measure corporate performance measures which can broadly be categorized as conventional or traditional performance measures and value based measures. Traditional performance measures also known as earnings based measures includes Earnings Per Share (EPS), Return On Equity (ROE), Return On Capital Employed (ROCE), Net Operating Profit After Tax (NOPAT). Traditional accounting measures of corporate financial performance are meeting up with ever increasing criticism and dissatisfaction. Opponents argue that these measures provide a relatively poor guide to shareholder value as it fails to consider the full cost of capital. Rappaport's pioneering work (1986, 1998) that focused on shareholder value took into account the shortcomings of the traditional accounting measures, thus preparing the way for a Value Based Management (VBM) approach. This new approach has gained widespread approval as it outlines two important propositions: ***first,*** that shareholder value creation is the primary corporate objective, and ***second***, that economic income of a company, as expressed by its EVA, is the primary measure of corporate performance (Arnold and Davies, 2000).

Economic Value Added (EVA), the Residual Income remaining after all costs, including the opportunity cost of the equity capital employed, is among the few performance metrics that have been widely adopted and are claimed to approximate shareholder returns. In effect, EVA is promoted by its proponents as being superior to other traditional and non-traditional performance metrics as a determinant and predictor of corporate success and value creation (Stewart, 1991; Ehrbar, 1998).

Various academic researchers, corporate executives, and business analysts around the globe have engaged in a rather intense debate in the last decade or so as to *whether the new value-based performance metrics have a higher correlation with stock values and their returns in comparison to other traditional accounting based measures.* Nevertheless, despite the growing amount of literature that has attempted to evaluate the claims made about EVA's superiority, less empirical research has so far been done to support the above assertions (e. g., Lehn and Makhija, 1997; Ittner & Larcker, 1998; Yook,1999; Lovata and Costigan, 2002; Feltham *et al.*, 2004). Moreover, the limited studies that have appeared in the literature have produced somewhat conflicting conclusions. For instance, Olsen, 1996; Peterson and Peterson, 1996; Biddle *et al.,* 1997; Chen and Dodd, 1997& 2001; De Villiers and Auret, 1997; Kramer and Pushner, 1997; Bao and Bao, 1998; Clinton & Chen, 1998; Ferguson and Leistikow, 1998; Stark and Thomas,1998; Farsio *et al.,* 2000; Kramer and Peters, 2001; Ray, 2001; Fernandez, 2002; Peixoto, 2002; Paulo, 2003; Sparling & Turvey, 2003; Ismail, 2006; Kim, 2006; Maditions *et al.,* 2006 & 2009; Palliam, 2006; Lee and Kim, 2009; Kyriazis and Anastassis, 2007; Shubita, 2010; and ArabSalehi & Mahmoodi, 2011 etc. have mostly not been supportive of EVA superiority over traditional measures.

Contrary to the above mentioned research, Walbert,1994; Grant,1996 & 2003; Lehn and Makhija,1996,1997; Milunovich and Tsuei, 1996 ; O'Byrne, 1996 &1997 ; Uyemura *et al.,* 1996; Bacidore *et al.*, 1997; Zafiris and Bayldon, 1999; Thenmozhi, 2000;Young and O'Byrne, 2001; Dastgir and Izadinia, 2004; Worthington and West, 2004; Feltham *et al.,* 2004; Forker and Powell, 2004; Ferguson *et al.*, 2005; Erasmus and Lambrechts, 2006 ; Elali, 2006; and Irala, 2007 etc. have made contributions that favor EVA on theoretical and/or empirical grounds.

The inconclusive and mixed results of these studies raise an important question. "*Is EVA really superior to conventional performance measures in explaining shareholder value or is it merely a fad promoted by a management consultancy firm?*" This conflicting evidence thus necessitates the conducting of further study that may provide better insight and understanding into this complex, yet crucial relationship between shareholder wealth creation and EVA. To further this idea, Lovata and Costigan (2002) stated, "*EVA is a concept that requires much additional research to support or contest the claims of its developers*".

Likewise, Feltham *et al.,* (2004) suggests that the debate should be reopened regarding whether EVA has greater relevance than other performance measures.

Literature on the efficacy of value based and conventional performance measures conclude that majority of the studies are from developed market and there is lack of evidence about emerging market as very few studies are available from Indian and other emerging market. This motivated the research on the analysis of the effectiveness of EVA and conventional corporate performance measures at both aggregate and disaggregates levels in predicting MVA in a fast growing capital market i.e. India and contribute to the ongoing debate by providing empirical evidence and thus form the rationale of conducting the present study.

The second rationale was due to the fact that proponents of value based measures like EVA, MVA etc. argued that traditional measures do not measure the value created or destroyed by companies because of accounting distortions and not considering the full cost of capital while computing the value added by the companies for shareholders. They provided empirical evidences and established the hypotheses that EVA is a superior measure than conventional performance measures which is not much tested in emerging market particularly in India. There is scope to conduct a study in emerging market and provide empirical validity of the Stern -Stewart hypotheses popularly known as SS hypothesis.

Further, most researchers on the efficacy of various corporate financial performance measures till date have tended to concentrate on either cross-sectional data or panel data with a relatively smaller time period. Examination of EVA and other accounting measures over a longer time frame would establish greater empirical certainty of these corporate financial performance measures and thus provide justification of conducting study. In the present thesis, 996 firms from 23 industries are being analyzed during the period 2000-2009 to provide greater empirical certainty of various corporate measures.

Lastly, due to recent surge in investment activities in Indian capital market, it is not hard to imagine that investors are relying either on accounting or earning based measures for their investment decision. However, these measures do not provide correct valuation of the company. Although EVA has been a theoretically well-established measure, but there is a need to establish empirical validity of EVA as surrogate of corporate performance measures in Indian market so that investor can use EVA for investment decision. Further, Ministry of Corporate Affairs has decided to revise Schedule VI to the Company Act 1956 (*Schedule VI stipulates the manner in which every company prepares and presents its balance sheet and profit and loss account)* and therefore one can expect increased numbers of EVA related information about Indian companies. Therefore, it is a good idea to provide empirical evidence about the potential usefulness of EVA to be used as mandatory corporate performance reporting in India. Present study attempts to analyze the performance and discusses the effectiveness of various conventional corporate performance measures along with value added performance measure called EVA of sample Indian companies both at aggregate and disaggregate levels.

7.2 KEY FINDINGS AND CONCLUSION

The major contribution of the present study is to provide empirical evidence by examining the efficacy of EVA and conventional corporate financial performance measures in predicting the shareholder wealth (MVA) of Indian companies at both ***aggregate*** and ***industry*** level. Motivated by the absence of a detailed study for an emerging market, such as the India, which is passing through a transitory phase from emerging status to mature, this thesis investigated the information content of EVA in comparison with seven established accounting measures of performance, namely the Net Operating Profit After Tax (NOPAT), Net Income (NI), Earnings Per Share (EPS), Cash Flow From Operations(OCF), Return On Capital Employed (ROCE), Return On Net Worth(RONW) and the Residual Income(RI) in explaining the contemporaneous MVA during 2000-2009. The results of this thesis provide a unique assessment of the efficacy of EVA and conventional performance measures at aggregate and industry employing panel data regression methodology by addressing the shortcomings of earlier researches as highlighted in the chapter 2. It also provides an in-depth analysis of behavior and determinates of MVA in different Indian industries during 2000-2009. The main findings and conclusions are presented here under the following two sub-sections:

7.2.1 Findings From Aggregate Level Analysis

From the analysis of descriptive statistics at aggregate level, it was found that mean value of MVA, NOPAT, RONW, ROCE, OCF are positive on average for the sample companies during 2000-2009. On the other hand, it was found the mean value of Economic Value Added (EVA) of sample companies is negative. It means companies sample companies are not able to create value for their shareholders during the study period. Negative value of EVA bring out two important observations, ***First*** is the significance of the Cost of Capital (WACC) and implies significant growth expectations for future EVA (Low EVA is also consistent with a potential upward bias in Stern Stewart's cost of capital estimates, that is, when the WACC increases, EVA decreases). ***Second*** is that in a competitive business scenario, most firms struggle to generate return in excess of their cost of capital. In other words, supernormal growth opportunities are not persistent over time. Thus, Indian companies on an average are not able to create value for its shareholders during the study period. The result are in line with many important studies of Biddle *et al.*, 1997; Kramer and Pushner, 1997; Garvey and Milbourn, 2000; Chen and Dodd, 2001; Kramer and Peters, 2001; Kim *et al.*,2004;Worthington & West, 2004;Pandey, 2005;Elali, 2006; Ismail,2006; Ranmana, 2007; Erasmus, 2008; Maditions *et al.*, 2009; Huang & Liu, 2010; and Shubita, 2010 who also reported mean negative value of EVA in their respective studies. Earnings Per Share (EPS) report highest and positive mean value during the study period in the companies.

1. Similar to the findings of Biddle *et al.*, 1997; Chen and Dodd, 1997, Worthington & West, 2004; Ismail, 2006; and Erasmus, 2008, the present study also found that EVA has lower correlation with MVA as compared to traditional measures like EPS and NI with the difference that the reported studies have used stock returns as dependent variable in place of MVA. It is interesting to note that Economic Profit measures (EVA and RI) although under perform traditional accounting profit measures (NI and EPS) but outperform NOPAT, standard accounting measures used by various researchers. On the basis of the results of correlation analysis one cannot fully refute the claim of EVA proponents that it is highly associated with MVA, as on the one hand EVA and RI both outperform NOPAT, ROCE, RONW and OCF and other the other hand underperform NI and EPS.
2. Descriptive statistics of components of EVA (OCF, ADJ, ACC, CC and ATI) suggest that MVA is positively associated with Cash Flow From Operations (OCF) and Accounting Accruals (ACC) while negatively correlated with Capital Charge (CC), After Tax Interest Cost (ATI) and Accounting Adjustments (ADJ). The correlation coefficient between MVA and OCF is highest and statistically significant while lowest correlation coefficient is observed between MVA and ACC also the not statistically significant. The positive relation between accounting accruals and MVA shows that Accruals (ACC) have hidden value which is reflected in the market value of the companies. Another interesting observation from the correlation matrix is that OCF and accounting accruals are negatively correlated and also not statistically significant. This relationship is consistent with the smoothing effect of accruals on a firm's cash flow from operations (Biddle *et al.*, 1997). Statistically significant positive correlations are found between Cash Flow From Operations (OCF), After Tax-Interest Cost (ATI) and Capital Charge (CC). According to Biddle *et al.*, (1997), firms with higher OCF also have higher debt and equity costs. The results about EVA

components of the present study are partially consistent with the findings of Biddle *et al.*, 1997; Elali, 2006; Ismail, 2006; and Erasmus, 2008.

3. Relationship between EVA and MVA as tested using hypothesis I and employing panel data regression method found that EVA is positively and statistically significantly linked to the contemporaneous MVA of Indian companies during the study period. Majority of studies by Stweart , 1991; Stewart and Chew, 1995; Grant, 1996; Lehn and Makhija, 1996; Milunovich and Tsuei, 1996; O'Byrne, 1996; Uyemura *et al.*,1996; Biddle *et al.*, 1997; Chen & Dodd 2001; Worthington & West, 2001& 2004; Grant, 2003; Dastgir and Izadinia, 2004; Elali, 2006; Kim, 2006; Maditinos *et al.*, 2006 &2009; Mishra & Kanwal, 2007; Kyriazis and Anastassis,2007; Visaltanachoti *et al.*, 2008; and Kim & Lee 2009 reported positive and statistically significant between EVA and MVA is positive and statistically significant. Thus result of the present study about hypothesis 1 is consistent with the many studies as reported above with the exception that in many of the studies report above have used stock returns in place of MVA as dependent variable in examining the relationship between EVA and shareholder value. Thus results of hypothesis 1 suggest that Economic Value Added (EVA) has positive influence on changes in the shareholder value (MVA) of Indian companies reflecting true value created by the Indian companies. Thereby claim of EVA proponents that EVA has positive influence on MVA of the companies is empirically true in Indian companies also.
4. Further examination of hypothesis 1 found that although EVA is positively associated with shareholder value of Indian companies much of the variation of MVA remains unexplained (Adjusted R^2 = 18.18%). In order to obtain more insight into the strength of EVA as a proxy of MVA, Net Operating Profit After Tax (NOPAT) is used as independent variable and it was found that although NOPAT has better association with MVA as compared to EVA but explanatory power of NOPAT lesser as compared to EVA. Only 11.10 percent of variations can be explained by the NOPAT as compared to 18.18 percent in case of EVA. Overall results suggest that the level of EVA is not only a better proxy but is also better predicator of Market Value Added (MVA) than the level of Net Operating Profit After Tax (NOPAT). As discussed earlier rationale of using NOPAT while making comparison with EVA was due to the fact that NOPAT is widely used mandated corporate performance measure in Indian companies.
5. Relative information content test was performed to compare the value relevance of various measures and to know whether EVA dominates conventional performance

measures in explaining contemporaneous MVA of Indian companies. It was hypothesized that EVA would outperform conventional performance in explaining the variation in the MVA of the companies. Studies by Stewart, 1991; Grant, 1996; Lehan and Makhija, 1997; Feltham *et al.*, 2004; Worthington & West, 2004; Urbanczyk *et al.*, 2005; Elali, 2006 ; and Erasmus, 2008 also proved that value based measures such as EVA exhibit higher association with stock returns or MVA than Accrual Earnings, Residual Income (RI) or Cash Flow From Operations. The results of fixed effect panel data regression suggest that all the measures are found to be positively associated with the changes in shareholder's Market Value (MVA) of sample companies during the 2000-2009. Further, it was also found that measure like ROCE, RONW and OCF are although positively correlated but not statistically significant association is found with MVA. From the relative information content test it was found that none of the variable is able to explain more than 22 percent of variations in the market value of Indian companies during the study period.

6. Although the EVA proponents report high levels of correlation between the measure and MVA, the results of this study do not fully support their claims that EVA outperforms traditional measures. EPS, a relatively simple traditional financial performance measure that is directly available from a firm's published financial statements, *outperforms* EVA in the relative information content tests (Table 5.14 panel B). RI also manages to outperform EVA. Most of the findings of Relative information content tests are consistent with those advanced by Biddle *et al.*, (1997) who report that EBEI (Earnings Before Extraordinary Income) was more associated with stock return than either of EVA and RI. Similarly research studies by Chen & Dodd, 2001; Worthington & West, 2001, 2004; and Ismail, 2006 reported that mandated corporate financial performance measures outperformed RI and EVA. De Villiers and Auret (1998) revealed that EPS outperforms EVA. They concluded that EVA does not offer any advantage over the traditional measures. Erasmus (2008) in his study about value based and conventional performance measures conclude that EBEI outperform EVA. Interestingly the result about Residual Income (RI) in the present study is very much consistent (RI is second best in explaining the changes in MVA) with those of Erasums, 2007; and Visaltanachoti, 2008. The other studies by researchers like Dodd and Chen, 1996; Ferguson and Leistikow,1998; Kramer and Pushner, 1997; Clinton & Chen, 1998; Ray, 2001; and Kim, 2006 also concluded that mandated traditional performance measures outperforms EVA and RI in explaining market value of firms. In addition, in the present study RI is better than

EVA in explaining the variation of MVA. The superiority of RI has been supported by Stark and Thomas (1998) and Erasmus (2008) who also report stronger association with stock returns and MVA by using a cross-sectional examination. Similar to Maditions *et al*., (2006, 2009) present study also found that EVA ranked after EPS as EPS has more information content than EVA and other measures. Thus, finding of our relative information content test does not fully support or reject the superiority as EVA although underperform EPS and RI but outperforms many mandated performance measures like NOPAT, NI, OCF, ROCE and RONW.

7. Following Elali (2006) and Maditions *et al*., (2006, 2009), incremental information content tests were performed in the second step to examine which pair of performance measures is the better predictor of firm value in Indian companies. Results of pairwise combination of EVA, EPS, NI, NOPAT, ROCE, RONW, RI and OCF conclude that EPS when combined with traditional measures (NI, ROCE, RONW, NOPAT and OCF) represents the most satisfactory explanation for the Market Value Added (MVA) in the Indian market as it has high value relevance as compared to EVA. The most logical pairing of information variables in explaining market value is therefore composed of EPS and NI. Traditional measures outperform value based measures in providing incremental information content. These results along with results of relative information content test refute the claims made by EVA proponents that EVA outperform traditional performance measures in explaining shareholder wealth (as measured by MVA). In contrast, the evidence points to Earnings Per Share (EPS) having higher incremental information content than EVA. These finding with Indian dataset fails to provide adequate support for Stewart's (1991) claim that EVA '*tracks*' changes in MVA better than any other performance measure, since it appears that the traditional earning based measures are equally competent of explaining the variation in MVA.
8. From the components analysis of EVA, it was found that Cash Flow From Operations (OCF) is positively associated with MVA during the study period. Along with OCF, Accruals (ACC) and Accounting Adjustments (ADJ) are positively associated with MVA, whereas After Tax Interest Expense (ATI) and Capital Charge (CC) are negatively correlated with MVA as hypothesized. Results of all the coefficients in the present study are consistent with the earlier studies of Biddle *et al.,* 1997; Ismail, 2006; Visaltanachoti *et al.,* 2008; and Erasmus, 2008. Similar to the results of Worthington & West (2004) relative information content tests of EVA components of the present study found that Cost of Capital (CC) is a better predictor of MVA as

compared to other measures. It is followed by OCF, ATI, ADJ and ACC. Further analysis of pairwise combination of OCF, CC, ATI, ACC and ADJ indicates that OCF when combined with ADJ represents the most satisfactory explanation for the Market Value Added (MVA) in the Indian market. Overall, the components of EVA that explains most changes in MVA is Accounting Adjustments (ADJ), followed by After Tax Interest (ATI), Cash Flow From Operations(OCF), Accounting Accruals (ACC) and Capital Charges(CC). These results of incremental information content test suggest that component unique to EVA i.e. ADJ has marginal incremental value relevance only when it is combined with traditional measures. EVA unique component is unable to outperform earnings in relative information test thereby rejecting that components unique to EVA has greater value relevance than earnings in explaining shareholder wealth (as measured by MVA).Thus, results of present study about Indian companies do not fully support the Stern Stewart claim about its superiority over earnings. Biddle *et al.*, (1997) and Ismail (2006) found that although EVA components have some incremental information content beyond that of conventional, their contribution does not provide EVA an edge over NI and NOPAT in explaining stock returns or MVA. Whereas, Worthington & West (2004) found that component unique to EVA i.e. ADJ has an edge over NI and NOPAT in explaining stock returns of Australian companies.

It can be summarized from the results of aggregate level that traditional measures better explain MVA than EVA of Indian companies during 2000-2009. The possible causes for this phenomenon may be attributed to the likelihood that the Indian market may see through various accounting conventions differently than Stern Stewart does when it calculates EVA. It also suggests that the market may place higher reliance on audited accounting earnings than the unaudited EVA metric.

7.2.2 Findings from Disaggregate (Industry wise) Level Analysis

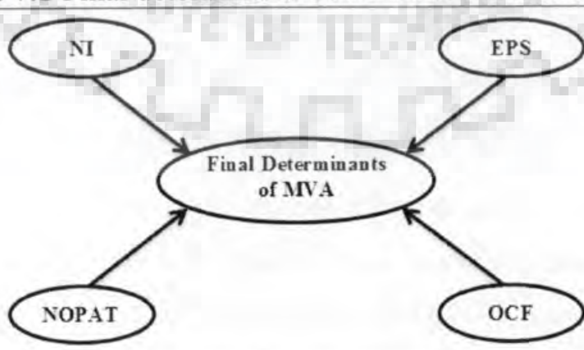
In the present study, in order to get more insights about the efficacy of various performance measures, industry wise performance of both value based and traditional measures was examined. Following are the important findings from the industry wise analysis of Indian dataset during the period 2000-2009:

1. Out of 23 (Twenty Three) sample industries analyzed, except chemical and chemical products and Textile industries companies in all industries have created value as MVA is found to be positive during the study period. Companies in FMCG industry reported largest mean MVA value during 2000-2009, whereas negative EVA is

reported for FMCG industry during the same period. Similarly except Footwear, Chemical and chemical products and Construction industries all have earned more than cost of capital as evident from positive EVA during the study period and created value for their shareholders.

2. The association of traditional measures such as Net Operating Profit After Tax (NOPAT), Net income (NI) and Cash Flow From Operations (OCF) with MVA is found to be highly strong in majority of the industries. Although EVA is found to have positive association with MVA in all industries but association is not better than those with popular and mandated traditional measures like NOPAT, NI and OCF. This result lead to conclusion that traditional performance measures are better associated with MVA in the Indian industries during the study period.
3. Significant difference is reported in the determinants of changes in the shareholder wealth (MVA) in the different industries from the analysis for each industry. Still it can be concluded that in majority of industries that combination of traditional measures have stronger association with MVA as compared to value based measure i.e. EVA. Net Income (NI), Net Operating Profit After Tax (NOPAT), Cash Flow From Operations (OCF), Earnings Per Share (EPS) and even Residual Income (RI) in some industries outperform EVA in explaining the changes in MVA in majority of the industries during the study period. In some industries like trading and chemical, EVA has statistical insignificant association with MVA. In transport service EVA is found to be negatively associated with MVA during 2000-2009. Figure 7.1 present the findings of multivariate regression by depicting the main determinants of MVA in majority of the sample industries.

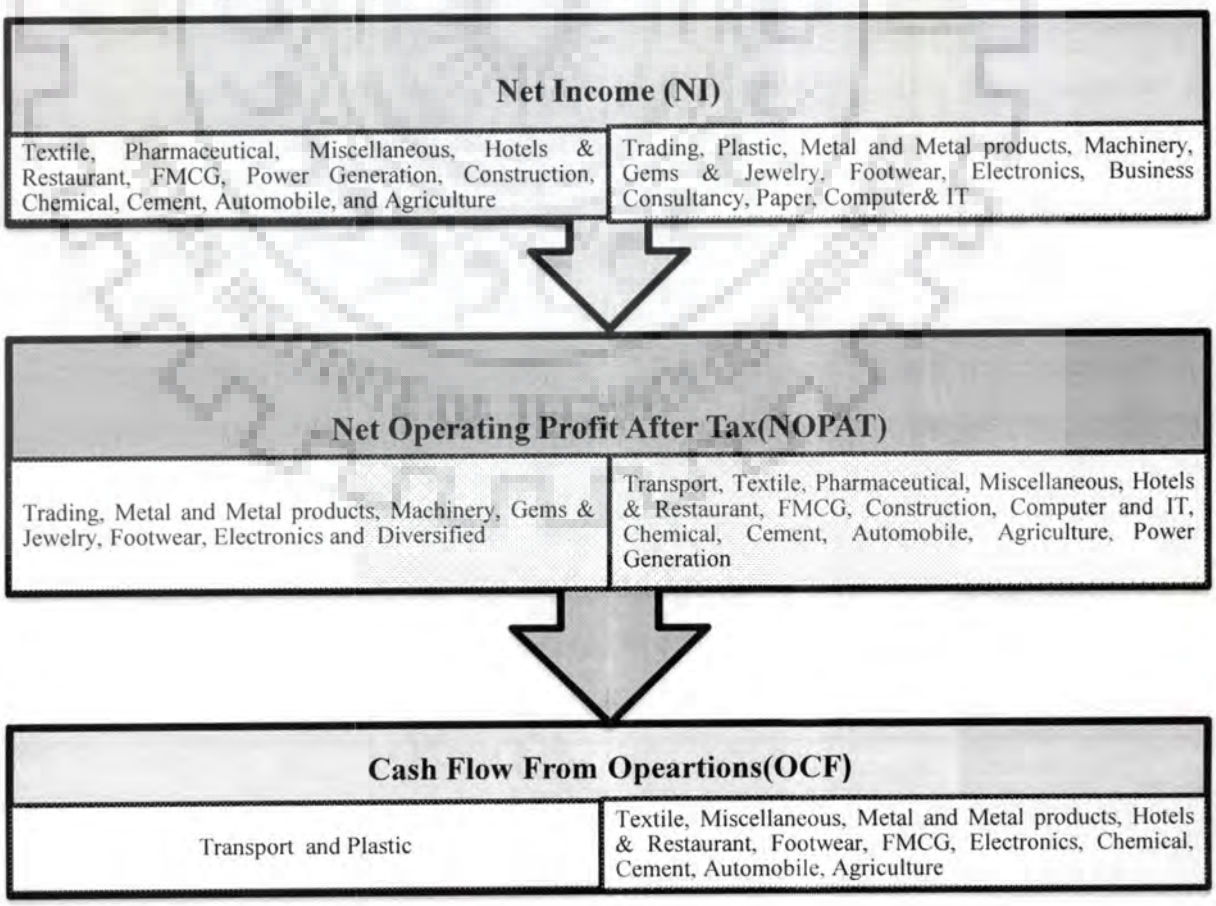
Figure 7.1 Final determinants of MVA in Indian industries



4. In order to rank the various performance measures in different industries, value relevance of each performance measures in all industries was compared using relative information content test. This is done by ranking the performance measures on the basis of explanatory power of each of the performance measures- as measured by R-

square in each industry. The results of relative information content test found to be similar to the results of multivariate regression analyzed. After ranking the performance measures in different industries, it was found that *Net Income (NI), Net Operating Profit After Tax (NOPAT) and Cash Flow From Operations (OCF)* are top three measures that explain MVA better than other measures examined. This highlight the superiority of traditional measures as compared to value based measure in explaining the changes in MVA of Indian industries. The above conclusion (based on relative information content test) has been crafted in the form of "**Top Three Corporate Financial Performance Measures**" in figure 7.2, where performance measures are arranged on the basis of their superiority in number of industries explaining MVA along with the name of the industries. It can be conclude from the results of industry wise ranking of various performance measures that traditional measures are better predictor of firm value as compared to value based measures in Indian industries during the study period. Thus, findings of relative information content do not provide any support to the claim of EVA proponents that EVA is superior to other measures in explaining MVA.

Figure 7.2 Top three corporate financial performance measures



Overall, results of disaggregate approach similar to aggregate approach also suggest that although EVA has significant and positive association with MVA in majority of Indian industries but it does not outperform traditional measures in explaining the changes in contemporaneous MVA during the study period . Thus, refute the claim of EVA superiority in explaining the MVA as compared to traditional measures.

7.3 SUGESSTIONS AND AREAS FOR FUTURE RESEARCH

7.3.1 Suggestions

Results obtained in the present study from a sample of Indian companies with different characteristics (e.g. transitory nature of emerging status, small size, different accounting standards and ownership structure) than those of the US and UK markets, seem to be consistent with the findings of Peterson and Peterson ,1996; Biddle *et al*., 1997; Chen and Dodd, 1998 and Ismail, 2006 for a sample of US companies, which also found no evidence of EVA outperforming various specifications of accounting earnings , with respect to their association with Market Value Added(MVA). Further similar to finding of Maditions *et al.*, (2006, 2009) about Greek capital market, the present study also establishes the empirical superiority of EPS as compared to EVA. However, the results in the present study differ from the earlier work of O'Byrne, 1996; Grant, 1996; Lehn and Makhija, 1997; Bao & Bao, 1998; Zafiris and Bayldon, 1999; and Feltham *et al.,* 2004 who advocated superiority of EVA in their respective researches. Following are some of the suggestions from the results obtained in the present study:

- As rightfully claimed by EVA advocates, improving EVA performance is associated with a higher Market Value (MVA). However, the association of EVA with MVA is not as strong in Indian market during the study period as suggested by EVA proponents or advocates. In any of the model EVA measure is not able to account more than 19% of the variation in contemporaneous MVA of sample companies in aggregate analysis and 44% in case of industry wise analysis. Thus, companies should be cautioned against any unrealistic expectation about the potential effect of EVA on MVA before using EVA as measures for reporting and performance management.
- Relatively low explanatory powers as revealed by R^2 of all measures examined in the present study suggest that 59% of the variation appears to be attributable to non-earnings based information. Financial measures are only able to explain 41 percent of the variation in the MVA of the Indian companies during the study. This suggests that if firms desire to more closely align performance measures with stock value, a measurement paradigm other than EVA will have to be developed and investors must

take into consideration non- financial variables in valuation of the firm. Companies must give emphasis on non- financial factors such as customer relationship management, product or service quality or R&D along with financial measures in order to capture the unexplained variations in the MVA. Many scholars like Biddle *et al.*, 1997; Chen & Dodd, 1997; Ismail, 2006; Kim, 2006; and Maditions *et al.*, 2009 have also recommended that along with financial variable, non-financial variables must be considered to establish their relationship with shareholder value (MVA).

- If the relative information content of the various financial performance measures is considered in the present study, Residual income has more information content than EVA in explaining the changes in the contemporaneous MVA of Indian companies during 2000-2009. This measure is easier and less complex to calculate than the EVA. Although component unique to EVA have incremental value relevance but using EVA rather than RI does provide only marginal benefit to the Indian companies. Further, the benefit may not be large enough to justify the extra cost involved in making the adjustments to the audited financial statements. Companies may be able to obtain most of the practical benefits promised by an EVA system by implementing the less complicated and costly RI measure.
- Although the EVA model in the present study did not seem to have superiority in explaining the MVA of listed companies in India, the findings of the study proved that EVA have some explanatory power in relation to the other traditional accounting measures as it stands third place in relative information content test. It can be believed that, as the Indian stock market becomes more mature and stable, this may have significant managerial implications for Indian companies and foreign and domestic institutional investors, who might want, in the future, to make their investment decisions on the basis of economic profit variables, along with the traditional measures of performance and use EVA for corporate performance reporting.
- Finally our industry level analysis of EVA and conventional performance measures indicate that although traditional measures are better indicator of MVA in majority of the industries but there exists significance difference in the explanatory power of among different traditional measures. This result may be attributed to the role of industry specific factors like size, capital, stage of competition etc. that may have significant effect on the firm valuation. Thus it is recommended on the basis of results that industry specific factors must be considered while using performance measures for firm valuation and designing investment portfolio.

7.3.2 Future Research

The present study focuses on the efficacy of EVA and conventional financial performance measures in Indian companies at aggregate and disaggregate level. The research highlights the value relevance of various performances in explaining the MVA during 2000-2009 with a dataset of 996 non-financial listed companies. However, there are few limitations of the present study these are listed below:

- The present study relies on purely financial factors that drive the shareholder value in Indian market and found less contribution of these measures in explaining the changes in shareholders wealth during the study period. In order to develop complete understanding what factors drive shareholder value in Indian companies, several other issues would have to be further considered. Hence, future research can be extended to include non-financial metrics such as customer satisfaction, research & development spending, productivity, product quality, employee satisfaction, community satisfaction, information technology and market share growth measures to mention a few along with financial measures and it could help in increasing the explanatory power of regression model up to an extent. Behavioral finance provides a good ground for inclusion of these variables.
- In this study a comparison could not be made of companies who adopted EVA financial management system (incorporating redesigned compensation plans) against companies those that did not. Although companies like Tata Consultancy Services, Godrej Consumer Products Limited (GCPL), Infosys Technologies limited, Tata Steel, Wipro and NIIT among very few that are disclosing EVA and implementing EVA financial management system. The results of present study indicate that EVA has some value relevance. A study comparing the performance of companies that have implemented EVA system to those who use traditional measures would also be valuable in order to establish further validity of using EVA by Indian companies.
- EVA has established it superiority in corporate world as it is based on the concept of value addition and also align with the shareholder objective of wealth maximization. EVA analysis, has unquestionable caught the attention of western countries both as a management innovation, as well as stock market analysis. The recognition of such a technique in the Indian context, nevertheless, shows diverse trend. A majority of the companies are still not prepared to employ EVA technique to evaluate their financial performance. A future study to find out the reasons for such phenomenon in Indian companies will be a good idea as it can help in popularizing the potential benefits

associated with EVA particularly in country like India where capital is still very costly; managers try to get higher return for every rupee invested in the business.

There are various ways the present study may be extended. As for the value relevance of EVA and conventional performance measures in explaining the MVA:

- To use Stern Stewart & Company tailored EVA as compared to own computed and makes a comparative assessment of results. However, for Indian companies Stern-Stewart & Co. tailored EVA figures are not much available at present.
- To employ alternative model for calculating the cost of capital such as Arbitrage Price Theory(APT) as compared to Capital Assets Pricing Model (CAPM) and examine the difference in the value relevance of EVA with conventional performance measures.
- To use as a dependent variable the stock returns and track the behavior of EVA along with traditional measures. Stock returns have been used by various researchers in the past. This will help to make direct comparison between Indian markets with those of others.
- To test the data using alternative time interval for dependent variable (two- year or five-year interval) and examine the behavior of determinants of shareholder wealth in Indian companies.

The findings of this thesis answer the efficacy of EVA and conventional performance measures and established that Indian market mainly discount traditional mandated corporate financial measures in valuation of companies. Although Economic Value Added (EVA) too has some value relevance it is suggested that Indian investor and corporate managers should use EVA along with traditional measures to know the real picture of the company.

The possible reason for not able to detect a stronger relationship between EVA and Market value Added in the present thesis may be attributed to the fact that Indian market have failed to recognize the reporting benefits of EVA through the period the researcher studied. Another reason can be that this research used current realizations of performance measures. So, it did not take into account expectations in the valuation of companies. The market value of company incorporates both current level of EVA and future growth expectation of EVA. To increase the MVA, management must increase the current level of EVA and change the market's expectations of future growth. It is also believed that as more and more firms start adopting EVA as internal management control technique and data will become publicly available in the future, market may start appreciating such strategies that will result into reflection of true value of the companies.

BIBLIOGRAPHY

BIBLIOGRAPHY

1. Abdeen, A. M. and Haight, T. G. (2002), "A Fresh Look at Economic Value Added: Empirical Study of The Fortune Five-hundred companies", *The Journal of Applied Business Research,* Vol. 18, no. 2, pp.27-35.

2. Abdullah, H., Habibullah, M. S. and Baharumshah, A. Z. (2008), "Fiscal Policy, Institutions and Economic Growth in Asian Economies: Evidence from the Pedroni's Cointegration Approach", *International Journal of Business and Management*, Vol. 3, no.4, pp. 107-126.

3. Acheampong, Y. J. and Wetzstein, M. E. (2001), "A comparative analysis of value-added and Traditional measures of performance: an efficiency score approach", *Faculty Series Paper* No. 16715, University of Georgia, Department of Agricultural and Applied Economics.

4. Anand, M., Garg, A., and Arora, A. (1999), "Economic Value Added: Business performance measure of shareholders' value", *The Management Accountant*, Vol. 34, no. 3, pp. 351-356.

5. Anderson, A. M., Bey, R. P. and Weaver, S.C. (2004), "Economic Value Added adjustments: much to do about Nothing?" *Conference Paper* presented at Midwest Finance Association Annual Conference Meeting, Chicago Article retrieved from: http://www.lehigh.edu/~incbeug/Attachments/Anderson%20EVA%204-7-05.pdf accessed on 12 September, 2008.

6. ArabSalehi, M. and Mahmoodi, I. (2011), "EVA or Traditional Accounting Measures; Empirical Evidence from Iran", *International Research Journal of Finance and Economics,* issue 65, pp. 51-58.

7. Arnold, G. and Davies, M. (2000), "Value-based Management: Context and Application". Chichester, UK: *John Wiley & Sons*.

8. Bacidore, J. M., Boquist, J. A., Milbourn, T. T. and Thakor, A. V. (1997), "The Search for the Best Financial Performance Measure", *Financial Analysts Journal*, Vol. 52, no.3, pp.11-20.

9. Baltagi, B.H. (2001, 2005), "Econometric Analysis of Panel Data", Chichester, UK: *John Wiley & Sons,* Inc.

10. Banerjee, A. (1997), "Economic Value Added (EVA) a better performance measure". *The Management Accountant,* issue December, pp. 886-888

11. Banerjee, A. (1999), "Economic Value Added and Shareholder Wealth: An Empirical Study of Relationship", *Paradigm*, Vol. 3, no 1, pp. 99-135

12. Banerjee, A. (2000), "Linkage between Economic Value Added and Market Value: An Analysis", *Vikalpa*, Vol. 25, no. 3, pp. 23-36.

13. Bao, B. and Bao, D. (1998), "Usefulness of value added and abnormal economic earnings: an empirical examination", *Journal of Business Finance & Accounting*, Vol. 25, no. 1-2, pp. 251–264.

14. Bardia, S. C. (2002), "Economic Value Added: Overall Consideration", *Economic Challenger*, issue April-June, pp. 1-7.

15. Bardia, S.C. (2008), "Evaluation of Financial Performance: A Dialectics", *The Icfai Journal of Accounting Research*, Vol. VII, no. 1, pp.36-49.

16. Barfield, R. (1998) "Nearly New," *Accountancy*, Vol. 121, no. 1253, pp. 41.

17. Barker, R. (2001), "Determining Value: Valuation Models and Financial Statements", *Harlow: Financial Times-Prentice-Hall.*

18. Barth, M. E., Beaver, W. H., Hand, J. M. and. Landsman, W. R. (1999), "Accruals, Cash Flows, and Equity Values", *Review of Accounting Studies*, Vol. 4, no. 3& 4, pp. 205-220.

19. Biddle, G. C., Bowen, R. M., & Wallace, J. S. (1997), "Does EVA beat earnings? Evidence on associations with stock returns and firm values", *Journal of Accounting and Economics,* Vol.24, issue 3, pp.301-336.

20. Biddle, G. C., Bowen, R.M. & Wallace, J.S. (1998), "Economic Value Added: Some Empirical EVAdence", *Managerial Finance*, Vol. 24, no.11, pp. 60-70.

21. Biddle, G. C., Bowen, R.M. & Wallace, J.S. (1999), "Evidence on EVA", *Journal of Applied Corporate Finance*, Vol.12, issue 2, pp. 69-79.

22. Biddle, G.C., Seow, G.S., and Siegel, A.F. (1995), "Relative versus incremental information content", *Contemporary Accounting Research*, Vol. 12, no.1, pp 1–23.

23. Black, A., Wright, P. and Bachman, J. E. (1998), "In Search of Shareholder Value: Managing the Drivers of Performance", London: *Pitman Publishing.*

24. Blair, A. (1997), "Watching the new metrics", *Management Today*, pp. 48-50.

25. Block, S. B. and Hirt, G. A. (2002), "Foundations of Financial Management", Irwin, *McGraw-Hill*.

26. Booth, R. (1997), "EVA as a Management Incentive", *Management Accounting*, issue April, pp. 48-50.

27. Breitung, J. (2000),"The Local Power of Some Unit Root Tests for Panel Data," in Baltagi (ed.), *Advances in Econometrics*, Vol. 15: Non stationary Panels, Panel Cointegration, and Dynamic Panels, Amsterdam: JAI Press, pp.161-178.

28. Brewer, P. C., Chandra, G. and Hock, C. A. (1999), "Economic Value Added (EVA): Its Uses and Limitations", *SAM Advanced Management Journal*, Vol.64, pp.4-10.

29. Burkette, G. and Hedley, T. (1997), "The truth about Economic Value Added", *The CPA Journal*, June, no. 7, pp. 464.

30. Chandra, P. (2001), "Financial Management: Theory and Practice", New Delhi: *Tata McGraw-Hill*.

31. Chen, S. and Dodd, J. L. (1997), "Economic Value Added (EVA): An Empirical Examination of a New Corporate Performance Measure", *Journal of Managerial Issues*, Vol. IX, no.3, pp. 318-333.

32. Chen, S., and Dodd, J. L. (2001), "Operating income, residual income and EVA: Which metric is more value relevant", *Journal of Managerial Issues*, Vol.13, issue1, pp.65-86.

33. Chmelikova, G. (2008),"Economic Value Added versus traditional performance metrics in the Czech Food-Processing sector", *International Food and Agribusiness Management Review*, Vol. 11, issue 4, pp. 49-65.

34. Clinton, B. D., & Chen, S. (1998), "Do new performance measures measure up?" *Management Accounting*, Vol.80, no.4, pp. 38-43.

35. Copeland, T. (2002), "What Do Practitioners Want", *Journal of Applied Finance*, Vol. 12, issue1, pp. 5-12.

36. Copeland, T., Koller, T. and Murrin, J. (1996), "Valuation: Managing and Measuring the Value of Companies", New York: *John Wiley and Sons Inc*.

37. Dastgir, M. and Izadinia, N., (2004), "The Relationship between Internal and Measures of Value Creation and External Measures of Operation Evaluation", *Iranian Accounting Studies*, Vol. 5, pp.131-155.

38. De Jager, P. (2008), "Panel data techniques and accounting research", *Meditari Accountancy Research,* Vol. 16, no. 2, pp. 53-68.

39. De Villiers, J. (1997), "The Distortions in Economic Value Added Caused by Inflation*", Journal of Economics and Business*, Vol.49, issue 3, pp. 285-300.

40. De Villiers, J. and Auret, C. J. (1998), "A comparison of EPS and EVA as explanatory variable for share price", *Journal for Studies in Economics and Econometrics,* Vol. 22, no. 2, pp. 47-63.

41. De Wet, J.H. (2005), "EVA versus traditional accounting measures of performance as drivers of shareholder value-a comparative analysis", *Meditari Accountancy Research*, Vol. 13, no. 2, pp.1-16.

42. De Wet, J.H., Toit, E. (2007), "Return on equity: A popular, but flawed measure of corporate financial Performance", *South Africa Journal of Business Management,* Vol.38, no.1, pp 59-69.

43. De Wet, JHvH and Hall, J.H. (2004), "The relationship between EVA, MVA and leverage", *Meditari Accountancy Research*, Vol. 12 no. 1, pp. 39–59.

44. Dearden, J. (1961), "Problem in decentralized financial control", *Harvard Business Review*, May-June, pp. 72-80.

45. Dearden, J. (1969), "The case against ROI control", *Harvard Business Review*, May-Jun, pp. 124-135.

46. Desai, A. M. and Ferri, F. (2006), "Understanding Economic Value Added", *Harvard Business School Publishing Case* No. 9-206-016, pp. 1-23.

47. Dierks, P.A., Patel, A. (1997), "What is EVA and how can it help your company?" *Financial Management,* vol. 79, no.5, pp.52-61.

48. Dodd, J. L. and Chen, S. (1996), "EVA: A new panacea", *Business and Economic Review,* Vol. 42, Issue 4, pp.26-28.

49. Drucker, P.F. (1995), "The information executives truly need", *Harvard Business Review*, January- February, pp. 54-62.

50. Durant, M.W. (1999), "Economic value added: The invisible hand at work", *Credit and Financial Management Review*, Vol. 5, no. 1.

51. Egginton, D. (1995), "Divisional performance measurement: Residual income and asset base", *Management Accounting Research*, Vol. 6, issue 3, pp. 201-222.

52. Ehrbar, Al. (1998), "EVA: The Real Key to Creating Wealth", New Jersey: *John Wiley & Sons, Inc.*

53. Ehrbar, Al. (1999), "Using EVA to measure performance and assess strategy", *Strategy & Leadership*, Vol. 27 No. 3, pp. 20-24.

54. Elali, W. (2006), "Contemporaneous relationship between EVA and shareholder value", *International Journal of Business Governance and Ethics*, Vol. 2, no.3/4 pp. 237 – 253.

55. Eljelly, A.M.A. and Alghurair, K.S. (2011), "Performance Measures and Wealth Creation in an Emerging Market: The Case of Saudi Arabia", *International Journal of Commerce and Management*, Vol. 11 issue 3/4, pp.54-71.

56. Erasmus P. (2008), "The Relative and incremental information content of value- based financial performance measures Cash Value Added (CVA)", *Management Dynamics: Contemporary Research* , Vol. 17, no. 1, pp.2-15.

57. Erasmus, P. (2008), "Value based financial performance measures: An evaluation of relative and incremental information content", *Corporate Ownership & Control*, Vol. 6, issue 1, pp. 66-77.

58. Erasmus, P. D. and Larnbrechts, I. J. (2006), "EVA and CFROI: A Comparative Analysis", *Management Dynamics: Contemporary Research*, Vol. 15, No. 1, pp. 15-26.

59. Fabozzi, J. F. and Grant, J. L. (2000), "Value-Based Metrics: Foundations and Practices", *New Hope*, Pennsylvania: Frank J. Fabozzi Associates.

60. Farsio, F., Degel, J. and Degner, J. (2000), "Economic Value Added (EVA) and stock returns", *The Financier*, Vol. 7, no. 1-4, pp. 115-118.

61. Feltham, G. D., Grant., E. I., Chima M., and Vaidyanathan, G. (2004), "Perhaps EVA does Beat Earnings-Revisiting Previous Evidence", *Journal of Applied Corporate Finance,* Vol. 16, no. 1, pp. 83-88.

62. Ferguson, R. and Leistikow, D. (1998), "Search for the Best Financial Performance Measure: Basic are Better', *Financial Analysts Journal,* Vol. 54, no.1, pp. 81-86.

63. Ferguson, R., Rentzler, J. and Yu, S. (2006), "Trading Strategy on EVA and MVA: are they reliable indicators of future stock performance?", *The Journal of Investing,* Vol. 15, issue 4, pp.88-94.

64. Ferguson, R., Rentzler, J., and Yu, S. (2005), "Does Economic Value Added (EVA) improve stock performance profitability?", *Journal of Applied Finance*, Vol. 15, no. 2, pp. 101- 113.

65. Fernandez, P. (2002), "Valuation Methods and Shareholder Value Creation", California: *Academic Press.*

66. Fernandez, P. (2003), "EVA, Economic Profit and Cash Value Added Do Not Measure Shareholder Value Creation", *The ICFAI Journal of Applied Finance*, Vol. 9, no. 3, pp. 74-94.

67. Finegan, P. T. (1989), "Financial incentives resolve the shareholder- value Puzzle", *Corporate Cashflow*, issue October, pp. 27-32.

68. Fiordelisi, F. (2004), "Shareholder value and the clash in performance measurement: Are banks special?" *working paper*, University of Wales Bangor.

69. Forker, J. and Powel, R. (2004), "Does EVA Beat earnings? Evidence on associations with stock returns and firm values- Revisited", *Conference paper at 27th Annual EAA Congress* in Prague, April.

70. Fountaine, D., Jordan, J.D., and Phillips, G. M. (2008), "Using Economic Value Added as a portfolio separation criterion", *Quarterly Journal of Finance and Accounting,* Vol. 47, no.2, pp.69-81.

71. Garvey, G. T., and Milbourn, T. T. (2000),"EVA versus Earnings: Does it matter which is more highly correlated with stock returns", *Journal of Accounting Research*, Vol. 38, issue 3, pp.209-245.

72. Ghanbari, A. M. and Sarlak N. (2006), "Economic Value Added: An Appropriate Performance Measure in Indian Automobile Industry", *The Icfaian Journal of Management Research*, Vol. V, no. 8, pp. 45-62.

73. Ghanbari, A. M. and Sarlak, N. (2007), "The Relationship between Economic Value Added and Market Value Added: An Empirical Analysis of Indian Automobile Industry", *The Icfai Journal of Accounting Research*, Vol. VI, no. 3, pp. 7-21.

74. Girotra, A. and Yadav, S. S. (2001), "Economic Value Added (EVA): A new flexible tool for measuring corporate performance", *Global Journal of Flexible Systems Management,* Vol. 2, no. 1, pp.7-18.

75. Goetzmann, W. N. and. Garstka, S. J. (1999), "The Development of Corporate Performance Measure: Benchmarks before EVA", Yale ICF *Working Paper*, No. 99-06, New Haven, Yale School of Management.

76. Goldberg, R. S. (1999), "Economic Value Added: A better measure for performance and compensation?", *The Journal of Corporate Accounting and Finance,* Vol. 11, issue 1, pp. 55- 67.

77. Grant, J. (2003), "Foundations of Economic Value Added", Hoboken, New Jersey: *Wiley*

78. Grant, J. L. (1996), "Foundations of EVA for investment managers", *Journal of Portfolio Management*, Vol. 23, issue1, pp. 41-48.

79. Greene, W. H. (2003), "Econometrics Analysis", Upper Saddle River, New Jersey: *Prentice Hall Griffith.*

80. Griffith, M. J.(2004), "The True Value of EVA", *Journal of Applied Finance,* Vol. 14, issue 2, pp. 25-29.

81. Gunther, T., B. Landrock and Muche, T. (2000), "Profit versus Value Based Performance Measures. An Empirical Investigation Based on the Correlation with Capital Market for German DAX-100 Companies, Controlling, vol.1, no.2, pp. 129-134(2003)

82. Hall, J. H. and Brummer, L.M. (1999), "The Relationship between the Market Value of a Company and Internal Performance Indicators", *Management Dynamics*, Vol. 8, issue 3, pp. 47-68.

83. Hausman, J. A. (1978), "Specification Tests in Econometrics", *Econometrica,* Vol.46, no. 6, pp.1251-1271.

84. Herzberg, M.M. (1998), "Implementing EBO/EVA Analysis in Stock Selection", *Journal of Investing*, Vol. 7, issue 1, pp. 45-53.

85. Hsiao, C. (2003), "Analysis of Panel Data", Cambridge: *Cambridge University Press.*

86. Hsiao, C. (2006), "Panel Data Analysis - Advantages and Challenges", *Test*, Vol.16, no. 1, pp. 1-22.

87. Huang, T.D. and Liu, Z.C. (2010), "A study of the relationship between related party transactions and firm value in high technology firms in Taiwan and China", *African Journal of Business Management,* Vol. 4, no.9, pp.1924 – 1931.

88. Huang, T.D. & Liu, C. Z. (2010), "Board composition and corporate value in Taiwan high technology firms", *The International Journal of Organizational Innovation*, Vol. 2, no. 4, pp.126-138.

89. Im, K. S., Pesaran, M. H., and Shin, Y. (2003), "Testing for Unit Roots in Heterogeneous Panels," *Journal of Econometrics*, Vol. 115, issue1, pp. 53–74.

90. Irala, L. R.(2007), "Corporate Performance Measures in India: An Empirical Analysis", WP-2007/01/A, Retrieved from: "http://ssrn.com/abstract=964375" on May 15, 2009.

91. Irala, L.R. (2005), "EVA: The right measure of managerial performance". *The Journal of Accounting and Finance*, Vol.19, no.2, pp.77-87.

92. Isa, M. and Lo, W. (2001), "Economic Value-Added in the Malaysian Listed Companies: A Preliminary Evidence", *Capital Markets Review*, Vol. 9 no. 1& 2, pp. 83-89.

93. Ismail, A. (2006), "Is economic value added more associated with stock return than accounting earnings? The UK evidence", *International Journal of Managerial Finance*, Vol. 2, no.4, pp. 343-353.

94. Ismail, I. (2008), "Performance of public-listed companies in Malaysia: using EVA", *Conference Paper at 6th One- day Symposium on Accountability, Governance and Performance*, Brisbane, Australia, February.

95. Ittner., C. D., and Larcker, D.F. (1998), "Innovations in Performance Measurement: Trends and Research implications". *Journal of Management Accounting Research*, Vol. 10, issue 1, pp. 205-238.

96. Jahur, J. S & Riyadh, N. A. (2002), "Economic value added as a Management Tool: A study on selected banking companies in Bangladesh", *Bank Parikarma*, Vol. XXVII, no. 1, pp. 46-63.

97. Jain, S.K. (1994), "How much value are you adding", *The Management Accountant*, issue August, pp. 610-611.

98. Jalili, M., (2002), "The Informational Application of Economic Value Added for Financial Performance Evaluation", *Master Thesis,* University of Imam Sadigh, Tehran.

99. Jennings, R. (1990), "A note on interpreting 'incremental information content", *The Accounting Review,* Vol. 65, no.4, pp. 925–932.

100. Jensen, M.C. and Meckling, W.H. (1999), "Specific knowledge and divisional performance measurement", *Journal of Applied Corporate Finance*, Vol. 12 Issue 2, pp.8-17.

101. Kalaiselvi, S. (2009) , "Financial Performance in Software Industry", New Delhi: *Discovery Publishing house private Limited* .

102. Kalton, G., Kasprzyk, D. and McMillen, D. (1989), "Nonsampling errors in panel surveys", In D. Kasprzyk, G. J. Duncan, G. Kalton and M. P. Singh (Eds), *Panel Surveys*. New York: John Wiley & Sons, Inc.

103. Kaur., M. and Narang, S. (2008), "Economic Value Added Reporting and Corporate Performance: A Study of Satyam Computer Services Ltd., *The Icfai Journal of Accounting Research*, Vol. VII, no. 2,pp.40-52.

104. Keef, S. P. and Roush, M. L. (2003), "The Relationship Between Economic Value Added and Stock Market Performance: A Theoretical Analysis", *Agribusiness*, vol. 19, no.2, pp. 245-253.

105. Keys, D. E., Azamhuzjaev, M., and James, M. (2001), "Economic Value Added: A critical analysis", *The Journal of Corporate Accounting & Finance*, Vol. 12, issue 2, pp. 65-71.

106. Kim, G. W. (2006), "EVA and Traditional Accounting Measures: Which Metric is a Better Predictor of Market Value of Hospitality Companies?" *Journal of Hospitality & Tourism Research*, Vol. 30, no. 1, pp 34-49.

107. Kim, J. J., Ahn, J. H., and Yun, J. K. (2004), "Economic value added (EVA) as a proxy for Market value added (MVA) and accounting earnings: empirical evidence from the business cycle", *Journal of Accounting and Finance Research*, Vol. 12;no. 1, pp. 40-48.

108. Kleiman, R.T. (1999), "Some New Evidence on EVA Companies", *Journal of Applied Corporate Finance*, Vol. 12, no. 2, pp.80-91.

109. Knight, J. (1998), "Value Based Management: Developing A Systematic Approach to Creating Shareholder Value", USA; *McGraw-Hill.*

110. Kolb, B. A., and DeMong, R. F. (1988), "Principles of Financial Management", Irwin: *Business Publications*, Inc.

111. Kramer, J. K. and Pushner, G. (1997), "An Empirical Analysis of Economic Value Added as a Proxy for Market Value Added", *Financial Practice and Education,* Vol. 7, no.1, pp. 41-49.

112. Kramer, J.K. and Peters, J. R. (2001), "An Inter-industry analysis of Economic Value Added as proxy for Market Value Added", *Journal of Applied Finance,* Vol. 11, no. 1, pp 41-49.

113. Kroll, K. M. (1997), "EVA and creating value", Industry week, vol. 49, April, pp. 102-109.

114. Kukreja, K. B. and Giridhar, S. B. (2005), "Value Based performance metrics in the Pharmaceutical industry, *SCMS Journal of Indian Management*, Vol. II, no. 1, pp. 60-79.

115. Kumar, A. (1999), "Economic Value Added: What it is and How Does it Help in Internal Management", *The Management Accountant,* issue July, pp. 487-501.

116. Kumar, S. and Sharma, A.K. (2011), "Association of EVA and Accounting Earnings with Market Value: Evidence from India", *Asia Pacific Journal of Business Administration*, Vol. 3, issue, 2 [*Forthcoming*].

117. Kyriazis, D, Anastassis C. (2007), "The Validity of the Economic Value Added Approach: an Empirical Application" *European Financial Management*, Vol. 13, no. 1, pp. 71-100.

118. Lee, S. and Kim, W. G. (2009), "EVA, refined EVA, MVA, or traditional performance measures for the hospitality industry", *International Journal of Hospitality Management*, Vol.28, issue 3, pp. 301-484.

119. Lehn, K. and A. K. Makhija (1997), "EVA, Accounting Profits, and CEO Turnover: An Empirical Examination, 1985-1994", *Journal of Applied Corporate Finance*, Vol.10, issue 2, pp. 90-97.

120. Lehn, K. and Makhija, A. K. (1996), "EVA & MVA as performance measures and signals for strategic change", *Strategy & Leadership,* Vol.24, issue 3, pp. 34-38.

121. Lev, B. (1989), "On the usefulness of earnings and earnings research. In: Lessons and directions from two decades of empirical research", *Journal of Accounting Research*, Vol. 27, pp. 153–192.

122. Levin, A., Lin, C. F., and Chu, C. (2001), "Unit Root Tests in Panel Data: Asymptotic and Finite-Sample Properties," *Journal of Econometrics*, Vol. 108, pp. 1–24.

123. Liao, X. and Feng, J. (2005), "An all-around analysis of EVA: an evaluating indicator of operating performance", *China-USA Business Review,* Vol. 4, no.4, pp.17-21.

124. Lin, C. and Zhilin, Q. (2008a), "Empirical Study of Integrated EVA Performance Measurement in China", *Canadian Social Science*, Vol.4, no.2, pp. 41-48.

125. Lin, C. and Zhilin, Q. (2008b), "What influences the company's economic Value Added? Empirical evidence from China Securities Market", *Management Science and Engineering,* Vol. 2, no. 1, pp. 66-76.

126. Livant, J. and Zarowin, P. (1990), "The Incremental Information Content of Cash-Flow Components", *Journal of Accounting and Economics*, Vol. 13, no.1, pp. 25-46.

127. Lloyd, M.A. (2005), "Benchmarking to economic value added- The case of Airways Corporation of New Zealand Limited", *Benchmarking: An International Journal*, Vol. 12, no. 2, pp. 138-150.

128. Lovata, L. M. and Costigan, M. L. (2002), "Empirical analysis of adopters of economic value added", *Management Accounting Research*, Vol., 13, vo. 2, pp.215-228.

129. Lubatkin, M., and Shrieves, R.E. (1986), "Towards reconciliation of market performance measures to strategic management research", *Academy of Management Review*, Vol. 11, issue 3, pp. 497-512.

130. Luber, R. B. (1996) "Who are the real wealth creators", *Fortune*, issue December , pp. 2-3.

131. Luke, D.A. (2004), "Multilevel modeling", Newbury Park: *Sage Publications*

132. Lumpkin, G.T. and Dess, G.G.,(1996), "Clarifying the entrepreneurial orientation construct and linking it to performance", *Academy of Management Review*, Vol. 21 no 1, pp.135-172.

133. Machuga, S. M., Pfeiffer, Jr. R.J., and Verma K. (2002), "Economic Value Added, Future Accounting Earnings, and Financial Analysts' Earnings Per Share Forecasts", *Review of Quantitative Finance and Accounting*, Vol.18, vo. 1, pp. 59-73.

134. Maddala, G. S. and Wu S. (1999), "A Comparative Study of Unit Root Tests with Panel Data and A New Simple Test," *Oxford Bulletin of Economics and Statistics*, Vol. 61, pp.631–52.

135. Madden, B.J. (1999), "CFROI Valuation: A Total System Approach to Valuing the Firm", *Oxford: Butterworth-Heinemann.*

136. Maditinos, I.D., Sevic, Z., and Theriou, N.G. (2006), "Economic Value Added (EVA). Is it really the best performance measure? A Review of the Theoretical and Empirical Literature. The case of Athens Stock Exchange (ASE)", retrieved from http://abd.teikav.edu.gr/articles/Review%20of%20Economic%20Sciences,%202006_EVA%20(2).pdf on September 18, 2008.

137. Maditinos, I.D., Sevic, Z., and Theriou, N.G. (2006), "A Review of the Empirical Literature on Earnings and Economic Value Added (EVA) in Explaining Stock Market Returns- Which Performance Measure is More Value Relevant in the Athens Stock Exchange (ASE)", *Conference Paper at the 5th Annual Conference of the Hellenic Finance & Accounting Association*, University of Macedonia, Thessaloniki, Greece, December.

138. Maditinos, I.D., Sevic, Z., and Theriou, N.G. (2009) ,"Modelling traditional accounting and modern value-based performance measures to explain stock market returns in the Athens Stock Exchange (ASE)", *Journal of Modelling in Management*, Vol. 4 issue 3, pp.182 – 201.

139. Maditions, I. D., Sevic, Z., and Theriou, N.G., (2006), "The Introduction of Economic Value Added in the Greek Corporate Sector", The Southeuropean, *Review of Business & Accounting*, Vol. 4, no. 2, pp. 1-11.

140. Makelainen, E. (1998), "Economic Value Added as a management tool", retrieved from "http://www.evanomics.com/evastudy.shtml" on 20 September 2008.

141. Malik, M. (2004), "EVA and traditional performance measures some empirical evidence", *The Indian Journal of Commerce,* Vol. 57, issue 2, pp. 32-38.

142. Malmi, T. and Ikaheimo, S. (2003), "Value Based Management practices-some evidence from the field" *Management Accounting Research,* Vol. 14, issue 3, pp. 235-254.

143. Mangala, D. and Simpy J. (2002), "Linkage between Economic Value Added and Market Value: An Analysis in India context", *Indian Management Studies Journal*, issue June, pp. 55-65.

144. Marshall, A. (1890), "Principles of Economics: An Introductory Volume", 1st ed., London: *Macmillan*.

145. Martin, J. D. and Petty, J.W. (2000), "Value based management: The corporate response to the shareholder valuation". Boston: *Harvard Business School Press.*

146. Milunovich, S. & Tsuei, A. (1996), "EVA in the computer industry", *Journal of Applied Corporate Finance*, Vol. 9, issue.1, pp.104-115.

147. Misra, A. and Kanwal, A. (2005), "Linkages between Economic Value Added and Share Prices: An Empirical Study of Indian Corporate Sector", *Icfai University Journal of Industrial Economics,* Vol. II, no. 4, pp.30-57.

148. Misra, A. and Kanwal, A. (2007), "Economic Value Added (EVA) as the most significant measure of financial performance: a study of select Indian firms", *Journal of International Business and Economics,* Vol. 7, no.1.

149. Mittal, R. K., Sinha, N. and Singh, A. (2008a), "An analysis of linkage between Economic Value Added and Corporate Social Responsibility", *Management Decision*, Vol. 46 issue 9, pp.1437 – 1443.

150. Mittal, R. K., Sinha, N. and Singh, A. (2008b), "EVA Implementation: The Case Study of Godrej Consumer Products Ltd.", *Global Business Review*, Vol. 9, no. 2 pp 287-298.

151. Moeinadin, M; Mansouri, E. and Nikooparvar, M.Z. (2011), Investigating the Power of Accounting and Economic Criteria at Stock Return Determinant, *Conference Paper* presented at the Annual Paris Conference on *'Money, Economy and Management',* Paris , 14-15 July .

152. Mohanty, P. (2004), "In Defense of EVA", *Conference Paper* presented at the Pacific Basin Finance, *Economics and Accounting Conference*, Bangkok, 9-11 August.

153. Mohanty, P. (2006), "Modified TVA-based Performance Evaluation", *IIMB-Management Review*, Vol. 18 no. 3, pp. 265-273.

154. Myers, R. (1996), "Metric Wars", *CFO*, Vol. 12, pp.41-50.

155. Nagar, N. (2007), "Drivers of Shareholders' Value", *Journal of Global Economy*, Vol. 3, no. 3& 4.

156. Nappi-Choulet, I., Missonier-Piera, F. and Cancel, M. (2007), "Value creation and the impact of corporate real estate assets ; an empirical investigation with French listed companies", *Conference Paper* presented at the Dauphine Real Estate Workshop, Paris-Dauphine University, *France*, 19 - 20 October.

157. O'Byrne, S. F. (1996), "EVA and market value", *Journal of Applied Corporate Finance*, Vol. 9, issue 1, pp.116-125.

158. O'Byrne, S.F. (1997), "EVA and shareholder return", *Financial Practice and Education*, Spring/Summer, Vol. 7, no.1, pp. 50-54.

159. O'Hanlon, J. and Peasnell, K. (1998), "Wall Street's contribution to management accounting: the Stern Stewart EVA financial management system", *Management Accounting Research*, Vol. 9, issue 4, pp. 421–444.

160. Obrycki, D. J., and Resendes, R. (2000), "Economic margins: The link between EVA and CFROI". In F. J. Fabozzi, & J.L. Grants (Eds). *Value-Based Metrics: Foundations and Practices*, New Hope, Pennsylvania: Frank J. Fabozzi Associates, pp. 157-178.

161. Ochsner, R. C. (1995), "Welcome to the new world of Economic value added" *Compensation and Benefits Review*, Vol. 27, no. 2, pp. 30.

162. Olsen, E.E. (1996), "Economic Value Added: Perspectives", Boston: *Boston Consulting group*.

163. Ottoson, E. and Weissenrieder, F. (1996), "Cash Value Added – A New Method for Measuring Financial Performance", Gothenburg: *Gothenburg University Press*.

164. Pal, K. and Kumar, A. (2007) , "Economic Value Added- an indicator of market price", *SCMS Journal of Indian Management*, Vol. IV, no. 2, pp. 87-104.

165. Pal, K. and Sura, S. J. (2007), "Economic value added and traditional performance measures: a review of academic and empirical literature", *Amity Journal of Business Strategy*, Vol. 1, no. 2, pp.110-120.

166. Palliam, R. (2006), "Further evidence on the information content of economic value added", *Review of Accounting and Finance*, Vol. 5, no. 3, pp. 204-215.

167. Pandey, I.M. (2005), "What drives shareholders value", IIMA, *working paper* no.2005-09-04.

168. Pattanayak, J.K. and Mukherjee, K. (1998), "Adding value to money", *The Chartered Accountant*, issue February, pp. 8-12.

169. Paulo, S. (2002), "Operating Income, Residual Income and EVA: Which Metric Is More Value Relevant- A Comment", *Journal of Managerial Issues*, Vol. 14, issue 4, pp.500-506.

170. Paulo, S. (2003), "Epistemology, Research Methodology and Rule 702 of the Federal Rules of Evidence versus EVA", *Journal of Business Ethics*, Vol. 44, no. 4, pp. 327-341.

171. Pearson, G. D. (1998), "An analysis of the explanatory power of economic value added and refined economic value added for share returns in the mining sector". *MBA Dissertation*, University of Cape Town, Graduate School of Business, South Africa.

172. Peixoto, S. (2002), "Economic Value Added Application to Portuguese Public Companies" Article retrieved from: "http://ssrn.com/abstract=302687" on 10 September, 2008.

173. Peterson, P. P., Peterson D. R. (1996), "Company performance and measures of value added", USA: *The Research Foundation of the Institute of Chartered Financial Analysts*.

174. Pettaway, G.H. (1980), "A return on capital measure-better than DCF?" *Harvard Business Review,* issue, May-June, pp. 34-38.

175. Phani, B.V. and Bhattacharya, A. (2000), "Economic Value Added: In search of Relevance", *Decision,* Vol. 27, no.2, pp.25-55.

176. Pindyck, R. S. and Rubinfeld, D.L. (1998), "Econometric Models & Economic Forecasts", Fourth Edition, Singapore: *McGraw-Hill.*

177. Rajan, M. V. (2000), "Discussion of EVA versus earnings: Does it matter which is more highly correlated with stock returns?", *Journal of Accounting Research*, Vol.38, pp. 247-254.

178. Rakshit, D. (2006), "EVA based performance measurement: a case study of Dabur India limited", *Vidyasagar University Journal of Commerce*, Vol.11, pp.40-59.

179. Ramana, D. V. (2007), "Economic Value Added and Other Accounting Performance Indicators: An Empirical Analysis of Indian Companies", *The Icfai Journal of Accounting Research,* Vol. VI, no. 2, pp. 7-20.

180. Ramana, D.V. (2004), "Market Value Added and Economic Value Added: Some Empirical Evidences", *Conference Paper* at *8th Capital Markets Conference, Indian Institute of Capital Markets(IICM)* Paper, Mumbai.

181. Rappaport, A. (1981), "Selecting strategies that create shareholder value", *Harvard Business Review*, Vol. 59, no. 3, pp. 139-49.

182. Rappaport, A. (1986), "Creating Shareholder Value", First Ed., New York: *The Free Press.*

183. Rappaport, A. (1998) "Creating Shareholder Value", Second Ed., New York: *The Free Press.*

184. Ray, R. (2001), "Economic Value Added: Theory Evidence, A Missing Link", *Review of Business*, Vol. 22, no. 2, pp. 25-39.

185. Ray, S. and Choudhuri, A. "In Search of Measuring Corporate Success: EVA as a Choice, Not a Panacea", Retrieved from: "papers.ssrn.com/sol3/papers.cfm?abstract_id=690022&rec=1&srcabs=920994" on May 17 (2009)

186. Reimann, B. C. (1988), "Managing for the Stockholder: An Overview of Value-Based Planning", *Planning Review*, Vol. 16, issue 1, pp. 10-22.

187. Rezaee, G., (2001), "The Effects of the Relationship between the EVA and ROE on the performance Evaluation of Vehicle Industry Listed on TSE", *Master Thesis, University of Allameh Tabatabaee*, Teharan

188. Riahi-Belkaeoui, A. (1993),"The Information Content of Value Added, Earnings, and Cash Flow: US Evidence", *The International Journal of Accounting*, Vol.28, issue 1, pp. 140-146.

189. Riahi-Belkaoui, A. and Picur, R. D. (1994), "Explaining Market Returns: Earnings Versus Value Added Data", *Managerial Finance*, Vol. 20, issue 9, pp. 44-55.

190. Riceman, S.S., Cahan, S. F. and Lal, M. (2000), "Do Managers Perform Better under EVA Bonus System?", *SSRN Working Paper Series*, September.

191. Robertson, S., and Batsakis, G. (1999), "Organizational Characteristics and the Emphasis Placed on Share Options in Performance Based Compensation Systems: An Agency Perspective". *Conference paper* presented at *AAANZ Annual Conference*, Cairns, 3-7 July.

192. Rogerson, W.P. (1997), "Intertemporal cost allocation and managerial investment incentives: A theory explaining the use of economic value added as a performance measure", *Journal of Political Economy*, Vol. 105, no. 4, pp. 770-795.

193. Ross, S. A., Westerfield, R. W., & Jordan, B. D. (2003), "Fundamentals of Corporate Finance", New Delhi: *Tata McGraw-Hill Publishing Company Limited.*

194. Saha, G. (2000), "Shareholder's Value and EVA, New Corporate Goals", *The Chartered Accountant*, Issue April, pp.46-51.

195. Saksena, P. (1998), "Economic value added and performance evaluation", *The Management Accountant*, May, pp. 341-342.

196. Schall, L. D., and Haley, C. W. (1980), "Introduction to Financial Management", New York: *McGraw-Hill Book Company.*

197. Sharma, S. R., Yu Hui, T. P. and Tan, M.W. (2007), "Value-added knowledge management for financial performance- The case of an East Asian conglomerate", *VINE: The Journal of information and knowledge management systems*, Vol. 37, no. 4, pp. 484-501.

198. Shil, N. C. (2009), "Performance Measures: An Application of Economic Value Added", *International Journal of Economics and Finance*, Vol. 4, no. 3, pp. 169-177.

199. Shubita, M. F. (2010), "The Relationship between EVA and Stock Returns", *International Research Journal of Finance and Economic*, Issue 59, pp. 35-41.

200. Singh, A. K. (1999), "Maximizing Wealth of Shareholders through EVA and BPR", *Pranjanan: The Journal of Management Awareness*, Vol. 2, no.1, pp. 65-75.

201. Singh, K. P. and Garg, M. C. (2004), "Disclosure of EVA in Indian corporate", *The Indian Journal of Commerce*, Vol.57, issue 2, pp.39-49.

202. Singh, K.P. and Garg, M. C. (2004), "Economic Value Added (EVA) in India Corporates" New Delhi: *Deep & Deep Publication India limited.*

203. Sparling, D. and Turvey, G. C. (2003), "Further Thoughts on the Relationship between Economic Value Added and Stock Market Performance", *Agribusiness*, Vol. 19, issue. 2; pp. 255-267.

204. Stark, A. W. and Thomas, H. M. (1998), "On the Empirical Relationship between Market Value and Residual Income in the U.K.", *Management Accounting Research*, Vol. 9, no.4, pp. 445-460.

205. Stern, J. (1990), "One way to build value in your firm, a la executive compensation." *Financial Executive*, Vol. 6, issue 6, pp. 51-54.

206. Stern, J. (1993), "Value and people management", *Corporate Finance*, issue July, no. 104, pp. 35-37.

207. Stern, J. (2001), "The EVA Challenge", New York : *John Wiley & Sons.*

208. Stern, J. M., Stewart, G.B., and Chew, D.H. (1995), "The EVA financial management systems", *Journal of Applied Corporate Finance,* Vol. 8, no. 2, pp 32-46.

209. Stewart, G. B. (1991), "The Quest for Value: A Guide for Senior Managers", First Ed., New York: *Harper Business*

210. Stewart, G. B., III. (1991), "The Quest for Value: The EVA® Management Guide", New York: *Harper Business.*

211. Stewart, G. B., III. (1994), "EVA-Fact or fantasy", *Journal of Applied Corporate Finance,* Vol.7, no. 2, pp. 71-84.

212. Sunitha, K. (2008), "Innovative vs. Traditional financial metrics: an appraisal", *Globsyn Management Journal,* Vol. 2, issue, 2, pp.19-26.

213. Swain, N., Mishra, C. S. and Kumar, M. (2002), "Shareholder Wealth Maximization in Indian Pharmaceutical Industry: An Econometric Analysis", *The ICFAI Journal of Applied Finance*, Vol. 8, no.6, pp.31-51.

214. Taub, S. (2003), "MVPs of MVA", *CFO Magazine*, Issue July, pp. 59-63.

215. Thenmozhi, M. (1999), "Economic value added as a measure of corporate performance", *The Indian Journal of Commerce*, Vol. 52, no. 4, pp. 72-85.

216. Thenmozhi, M. (2000), "Market Value Added and Share Price Behavior: An Empirical Study of BSE Sensex Companies", *Delhi Business Review- An International Journal of Society for Transformation and Research,* Vol.1, no.1, pp.83-92.

217. Tian, I.V., Keung, E. Y. and Chow, F. Y. (2003) ," Economic Value Added in the Hong Kong listed companies: A Preliminary Evidence", *Conference Paper in Integrative Modelling of Biophysical, Social, and Economic Systems for Resource Management Solutions* 2003 proceedings of the International Congress on Modeling and Simulation(MODSIM 2003) in Townsville, Australia, July, 14-17, pp.1439-44.

218. Todd, M.T. (1997), "EVA's Charm as a performance measures", *Business Standard,* issue January, pp. 41-45.

219. Tomas, P. and Rima, T. (2008), "Corporate Performance and the measures of value added", *Transport*, Vol. 23, no. 8, pp. 194-201.

220. Tong, Y., Lu, C. and Cheng, X. (2010), "An Empirical Study on the Value Relevance of Economic Value", *Conference Paper* presented in *Computational Intelligence and Software Engineering*, 2009 held on December 10-12, Wuhan, China.

221. Tortella, B. D. and Brusco, S. (2003), "The Economic Value Added (EVA): An analysis of market reaction", *Advances in Accounting,* Vol. 20, pp.265-290.

222. Tortella, T. (2002), "What does the market think of EVA?" *Bartolome Deya Departamento de Economia y Empresa Universidad de las Islas Baleares Carretera de Valldemossa* Spain, pp. 178.

223. Tsuji, C. (2006), "Does EVA beat earnings and cash flow in Japan?", *Applied Financial Economics*, Vol. 16, no. 16, pp.1199-1216.

224. Tully, S. (1993), "The Real Key to Creating Wealth", *Fortune*. September 20, pp. 38-50.

225. Tully, S. (1997), "Adding value", *Business Today*, Sept. 22-Oct. 6, pp. 68-73.

226. Turvey, C. G., Lake, L., Duren, E. V. and Sparing, D. (2000), "The Relationship between Economic Value Added and the Stock Market Performance of Agribusiness Firms", *Agribusiness*, Vol.16, issue 4, pp. 399-416.

227. Urbanczyk, E., Jaroszewicz, M. E. and Urbaniak, S. A. (2005) ,"Economic value added versus cash value added: The case of companies in transitional economy, Poland", *International journal of Banking and Finance*, Vol. 3, issue1, pp. 107-117.

228. Uyemura, D. G., Kantor, C. C. and Pettit, J.M. (1996), "EVA for Banks: value creation, risk management, and profitability measurements", *Journal of Applied Corporate Finance*, Vol. 9, issue 2, pp. 94-109.

229. Verma, B. P. (2002) , "Economic value addition by Indian Banks: A study", *Conference Paper* presented *Capital Markets Conference, UTI Institute of Capital Markets,* Mumbai, India, 19-20 December.

230. Vijayakumar, A. & Selvi M. A. (2007), " EVA and MVA of India Automobile Industry- An empirical study of relationship", *Abhigyan*, Vol. XXV, no. 3, pp 54-65.

231. Visaltanachoti, N., Luo, R. and Yi, Yi. (2008) , " Economic value added (EVA) and sector returns", *Asian Academy of Management Journal of Accounting And Finance*, Vol. 4, no. 2, pp. 21-41.

232. Walbert, L. (1994), "The Stern Stewart Performance 100: Using EVA to Build Market Value", *Journal of Applied Corporate Finance*, Vol. 6, no.4, pp.109-112.

233. Weissenrieder, F. (1997), "Value based management: Economic value added or Cash value added?", *Gothenburg Studies in Financial Economics, Working paper* No. 1997:3, Sweden.

234. Wild, J. J., and Subramanyam, K. R. (2009), "Financial Statement Analysis", 10th edition, Boston: *McGraw-Hill/Irwin*.

235. Woodridge, J.M. (2002), "Econometric Analysis of Cross Section and Panel Data", Boston: *MIT Press*.

236. Worthington, A. C. and West, T. (2001), "Economic Value-Added: A Review of the Theoretical and Empirical Literature", *Asian Review of Accounting*, Vol. 9, issue 1, pp 67-86.

237. Worthington, A.C. & West, T. (2004), "Australian evidence concerning the information content of Economic Value-Added", *Australian Journal of Management*, Vol. 29, no. 2, pp.201-224.

238. Worthington, A.C. and West, T. (2001), "The Usefulness of Economic Value-Added (EVA) and its Components in the Australian Context", *Accounting, Accountability and Performance*, Vol.7, issue 1, pp. 73-90.

239. Ylital, J. (2009), "Assessing the effects of entrepreneurial orientation in Finnish software industry", *Bachelor Thesis, Helsinki University of Technology*, Finland.

240. Yook, K. C. (1999), "Estimating EVA using Compustat PC Plus". *Financial Practice and Education,* Vol. 9, no. 2, pp. 33-37.

241. Young, D. (1997), "Economic value added: A primer for European managers", *European Management Journal,* Vol.15, issue 4, pp.335-343.

242. Young, S.D. (1999), "Some reflections on accounting adjustments and economic value added", *Journal of Financial Statement Analysis*, Vol. 4, no.2, pp. 7–13.

243. Young, S.D. and O'Byrne, S. F. (2001), "EVA and Value-Based Management: A Practical Guide to Implementation", New York : *McGraw-Hill*

244. Zafiris, N. and Bayldon, R. (1999), "Economic Value Added and Market Value Added: a simple Version and Application", *Journal of Applied Accounting Research.* Vol.5, issue 2, pp. 84-107.

245. Zaima, J. K., Turetsky, H. F. and Cochran, B. (2005), "The MVA-EVA relationship: separation of market driven versus firm driven effects", *Review of Accounting and Finance,* Vol. 4, issue 1, pp.32-49.

246. Zimmerman, J. L. (1997), "EVA and Divisional Performance Measurement: Capturing Synergies and other Issues", *Journal of Applied Corporate Finance*, Vol.10, no. 2, pp.98-109.

ANNEXURES

ANNEXURE I: LIST OF SAMPLE COMPANIES

1. 3M India Ltd.
2. A B B Ltd.
3. A B C Bearings Ltd.
4. A B C India Ltd.
5. A B G Infralogistics Ltd.
6. A B M Knowledgeware Ltd.
7. A C C Ltd.
8. A C I Infocom Ltd.
9. A D C India Communications Ltd.
10. A D F Foods Ltd.
11. A S M Technologies Ltd.
12. A T N International Ltd.
13. A V T Natural Products Ltd.
14. Aarti Drugs Ltd.
15. Aarti Industries Ltd.
16. Aarvee Denims & Exports Ltd.
17. Aasda Life Care Ltd.
18. Aban Offshore Ltd.
19. Abbott India Ltd.
20. Accel Transmatic Ltd.
21. Accentia Technologies Ltd.
22. Ace Software Exports Ltd.
23. Acknit Industries Ltd.
24. Adani Enterprises Ltd.
25. Addi Industries Ltd.
26. Aditya Birla Chemicals (India) Ltd.
27. Aditya Birla Nuvo Ltd.
28. Aditya Ispat Ltd.
29. Ador Fontech Ltd.
30. Ador Multiproducts Ltd.
31. Ador Welding Ltd.
32. Advanced Micronic Devices Ltd.
33. Advani Hotels & Resorts (India) Ltd.
34. Advent Computer Services Ltd.
35. Aegis Logistics Ltd.
36. Aftek Ltd.
37. Agio Paper & Inds. Ltd.
38. Agro Dutch Inds. Ltd.
39. Agro Tech Foods Ltd.
40. Ahlcon Parenterals (India) Ltd.
41. Ahmedabad Steelcraft Ltd.
42. Aimco Pesticides Ltd.
43. Ajel Infotech Ltd.
44. Ajmera Realty & Infra India Ltd.
45. Aksharchem (India) Ltd.
46. Akzo Nobel India Td.
47. Albert David Ltd.
48. Alchemist Ltd.
49. Alcobex Metals Ltd.
50. Alembic Ltd.
51. Alfa Laval (India) Ltd.
52. Alfa Transformers Ltd.
53. Alkyl Amines Chemicals Ltd.
54. Alok Industries Ltd.
55. Alpha Hi-Tech Fuel Ltd.
56. Alphageo (India) Ltd.
57. Alps Industries Ltd.
58. Alstom Projects India Ltd.
59. Alufluoride Ltd.
60. Amara Raja Batteries Ltd.
61. Amarjothi Spinning Mills Ltd.
62. Ambalal Sarabhai Enterprises Ltd.
63. Ambuja Cements Ltd.
64. Amco India Ltd.
65. Amforge Industries Ltd.
66. Amit Spinning Inds. Ltd.
67. Amtek Auto Ltd.
68. Ancent Software International Ltd.
69. Andhra Cements Ltd.
70. Andhra Petrochemicals Ltd.
71. Andhra Pradesh Paper Mills Ltd.
72. Anik Industries Ltd.
73. Anuh Pharma Ltd.
74. Apar Industries Ltd.
75. Apcotex Industries Ltd.
76. Aplab Ltd.
77. Apollo Hospitals Enterprise Ltd.
78. Apollo Tyres Ltd.
79. Archies Ltd.
80. Areva T & D India Ltd.
81. Arihant Foundations & Housing Ltd.
82. Arora Fibres Ltd.
83. Artefact Projects Ltd.
84. Artson Engineering Ltd.
85. Arvind Ltd.

86. Arvind Remedies Ltd.
87. Asahi India Glass Ltd.
88. Asahi Infrastructure & Projects Ltd.
89. Ashco Niulab Inds. Ltd.
90. Ashima Ltd.
91. Ashok Alco-Chem Ltd.
92. Ashok Leyland Ltd.
93. Asian Electronics Ltd.
94. Asian Hotels (North) Ltd.
95. Asian Paints Ltd.
96. Asian Star Co. Ltd.
97. Assam Co. Ltd.
98. Astrazeneca Pharma India Ltd.
99. Atlas Copco (India) Ltd.
100. Atlas Cycles (Haryana) Ltd.
101. Atul Auto Ltd.
102. Atul Ltd.
103. Aurangabad Paper Mills Ltd.
104. Auro Laboratories Ltd.
105. Aurobindo Pharma Ltd.
106. Austin Engineering Co. Ltd.
107. Autolite (India) Ltd.
108. Automotive Axles Ltd.
109. Avance Technologies Ltd.
110. Avanti Feeds Ltd.
111. Avaya Globalconnect Ltd.
112. Aventis Pharma Ltd.
113. Avon Organics Ltd.
114. Axtel Industries Ltd.
115. B & A Ltd.
116. B 2 B Software Technologies Ltd.
117. B A S F India Ltd.
118. B C C Fuba India Ltd.
119. B E M L Ltd.
120. B I T S Ltd.
121. B K V Industries Ltd.
122. B L S Infotech Ltd.
123. B O C India Ltd.
124. B P L Ltd.
125. B S E L Infrastructure Realty Ltd.
126. B S L Ltd.
127. Bacil Pharma Ltd.
128. Bajaj Electricals Ltd.
129. Bajaj Hindusthan Ltd.
130. Bajaj Hindusthan Sugar & Inds. Ltd.
131. Bal Pharma Ltd.
132. Balaji Distilleries Ltd.
133. Balkrishna Industries Ltd.
134. Ballarpur Industries Ltd.
135. Balmer Lawrie & Co. Ltd.
136. Balrampur Chini Mills Ltd.
137. Balurghat Technologies Ltd.
138. Banco Products (India) Ltd.
139. Bannari Amman Sugars Ltd.
140. Banswara Syntex Ltd.
141. Basant Agro Tech (India) Ltd.
142. Bata India Ltd.
143. Bayer Cropscience Ltd.
144. Beckons Industries Ltd.
145. Bell Ceramics Ltd.
146. Benares Hotels Ltd.
147. Berger Paints India Ltd.
148. Best & Crompton Engg. Ltd.
149. Bhagwati Autocast Ltd.
150. Bhagyanagar India Ltd.
151. Bhagyanagar Wood Plast Ltd.
152. Bhansali Engineering Polymers Ltd.
153. Bharat Bijlee Ltd.
154. Bharat Electronics Ltd.
155. Bharat Forge Ltd.
156. Bharat Gears Ltd.
157. Bharat Heavy Electricals Ltd.
158. Bharat Immunologicals & Biologicals Corpn. Ltd.
159. Bharat Petroleum Corpn. Ltd.
160. Bharat Seats Ltd.
161. Bhartiya International Ltd.
162. Bhilwara Spinners Ltd.
163. Bhushan Steel Ltd.
164. Bilpower Ltd.
165. Binani Industries Ltd.
166. Birla Corporation Ltd.
167. Birla Ericsson Optical Ltd.
168. Birla Power Solutions Ltd.
169. Birla Precision Technologies Ltd.
170. Bliss G V S Pharma Ltd.
171. Bloom Dekor Ltd.
172. Blue Dart Express Ltd.
173. Blue Star Ltd.
174. Bodal Chemicals Ltd.
175. Bombay Burmah Trdg. Corpn. Ltd.
176. Bombay Dyeing & Mfg. Co. Ltd.
177. Bombay Swadeshi Stores Ltd.
178. Borax Morarji Ltd.
179. Borosil Glass Works Ltd.
180. Bosch Ltd.

181. Britannia Industries Ltd.
182. C C A P Ltd.
183. C E S C Ltd.
184. C G-V A K Software & Exports Ltd.
185. C M C Ltd.
186. Calcom Vision Ltd.
187. Cals Refineries Ltd.
188. Camlin Ltd.
189. Camphor & Allied Products Ltd.
190. Caplin Point Laboratories Ltd.
191. Caprihans India Ltd.
192. Carborundum Universal Ltd.
193. Carnation Industries Ltd.
194. Carol Info Services Ltd.
195. Castrol India Ltd.
196. Cat Technologies Ltd.
197. Catvision Products Ltd.
198. Ceat Ltd.
199. Centum Electronics Ltd.
200. Century Enka Ltd.
201. Century Textiles & Inds. Ltd.
202. Chambal Fertilisers & Chemicals Ltd.
203. Chemfab Alkalis Ltd.
204. Chemplast Sanmar Ltd.
205. Chennai Meenakshi Multispeciality Hospital Ltd.
206. Chennai Petroleum Corpn. Ltd.
207. Choksi Imaging Ltd.
208. Chordia Food Products Ltd.
209. Chowgule Steamships Ltd.
210. Ciba India Ltd. [Merged]
211. Cindrella Hotels Ltd.
212. Cinerad Communications Ltd.
213. Cipla Ltd.
214. Clariant Chemicals (India) Ltd.
215. Classic Diamonds (India) Ltd.
216. Clio Infotech Ltd.
217. Clutch Auto Ltd.
218. Cmi F P E Ltd.
219. Cochin Minerals & Rutile Ltd.
220. Colgate-Palmolive (India) Ltd.
221. Colinz Laboratories Ltd.
222. Compact Disc India Ltd.
223. Computer Point Ltd.
224. Computer Skill Ltd.
225. Concurrent (India) Infrastructure Ltd.
226. Container Corpn. Of India Ltd.
227. Continental Controls Ltd.
228. Control Print Ltd.
229. Coral Laboratories Ltd.
230. Coromandel International Ltd.
231. Cosco (India) Ltd.
232. Cosmo Ferrites Ltd.
233. Cosmo Films Ltd.
234. Cranex Ltd.
235. Crazy Infotech Ltd.
236. Crest Animation Studios Ltd.
237. Crisil Ltd.
238. Crompton Greaves Ltd.
239. Crystal Software Solutions Ltd.
240. Cummins India Ltd.
241. Cybele Industries Ltd.
242. Cybermate Infotek Ltd.
243. Cybertech Systems & Software Ltd.
244. D C M Ltd.
245. D C M Shriram Consolidated Ltd.
246. D C W Ltd.
247. D F M Foods Ltd.
248. D I C India Ltd.
249. D I L Ltd.
250. D S Kulkarni Developers Ltd.
251. Dabur India Ltd.
252. Dagger-Forst Tools Ltd.
253. Dai-Ichi Karkaria Ltd.
254. Daikaffil Chemicals India Ltd.
255. Dalmia Cement (Bharat) Ltd.
256. Dazzel Confindive Ltd.
257. De Nora India Ltd.
258. Deccan Cements Ltd.
259. Deepak Fertilisers & Petrochemicals Corpn. Ltd.
260. Deepak Spinners Ltd.
261. Delta Magnets Ltd.
262. Delton Cables Ltd.
263. Deltron Ltd.
264. Denso India Ltd.
265. Dhampur Sugar Mills Ltd.
266. Dhampure Specialty Sugars Ltd.
267. Dhanuka Agritech Ltd.
268. Dharamsi Morarji Chemical Co. Ltd.
269. Dharani Sugars & Chemicals Ltd.
270. Dhoot Industrial Finance Ltd.
271. Dhunseri Tea & Inds. Ltd.
272. Diamines & Chemicals Ltd.
273. Diamond Power Infrastructure Ltd.
274. Digjam Ltd.

275. Divya Jyoti Inds. Ltd.
276. Dolphin Medical Services Ltd.
277. Dolphin Offshore Enterprises (India) Ltd.
278. Donear Industries Ltd.
279. Dr. Agarwal's Eye Hospital Ltd.
280. Dr. Reddy's Laboratories Ltd.
281. Dredging Corpn. of India Ltd.
282. Dujodwala Paper Chemicals Ltd.
283. Dujodwala Products Ltd.
284. Dynamatic Technologies Ltd.
285. E I D-Parry (India) Ltd.
286. E I H Ltd.
287. E P C Industrie Ltd.
288. E P I C Enzymes, Pharmaceuticals & Indl. Chemicals Ltd.
289. E.Com Infotech (India) Ltd.
290. Eastcoast Steel Ltd.
291. Ecoboard Industries Ltd.
292. Ecoplast Ltd.
293. Eicher Motors Ltd.
294. Eimco Elecon (India) Ltd.
295. Elantas Beck India Ltd.
296. Elder Health Care Ltd.
297. Elecon Engineering Co. Ltd.
298. Electrosteel Castings Ltd.
299. Electrotherm (India) Ltd.
300. Elegant Marbles & Grani Inds. Ltd.
301. Elgi Equipments Ltd.
302. Elgi Rubber Co. Ltd.
303. Elnet Technologies Ltd.
304. Elpro International Ltd.
305. Emco Ltd.
306. Emmessar Biotech & Nutrition Ltd.
307. Empee Sugars & Chemicals Ltd.
308. Empire Industries Ltd.
309. Emtex Industries (India) Ltd.
310. Engineers India Ltd.
311. Enkei Castalloy Ltd.
312. Entegra Ltd.
313. Envair Electrodyne Ltd.
314. Era Infra Engg. Ltd.
315. Esab India Ltd.
316. Escorts Ltd.
317. Eskay K'n'it (India) Ltd.
318. Essar Shipping Ports & Logistics Ltd.
319. Essel Propack Ltd.
320. Ester Industries Ltd.
321. Eurotex Industries & Exports Ltd.
322. Eveready Industries (India) Ltd.
323. Everest Industries Ltd.
324. Everlon Synthetics Ltd.
325. Excel Industries Ltd.
326. Exide Industries Ltd.
327. Expo Gas Containers Ltd.
328. F A G Bearings India Ltd.
329. F D C Ltd.
330. Fairfield Atlas Ltd.
331. Faze Three Ltd.
332. Fedders Lloyd Corpn. Ltd.
333. Federal-Mogul Goetze (India) Ltd.
334. Fem Care Pharma Ltd. [Merged]
335. Ferro Alloys Corpn. Ltd.
336. Fiberweb (India) Ltd.
337. Filatex India Ltd.
338. Filmcity Media Ltd.
339. Financial Technologies (India) Ltd.
340. Fine-Line Circuits Ltd.
341. Finolex Cables Ltd.
342. Finolex Industries Ltd.
343. Flawless Diamond (India) Ltd.
344. Foods & Inns Ltd.
345. Forbes & Co. Ltd.
346. Force Motors Ltd.
347. Fortis Malar Hospitals Ltd.
348. Foseco India Ltd.
349. Frontier Information Technologies Ltd.
350. Fulford (India) Ltd.
351. Futura Polyesters Ltd.
352. G A I L (India) Ltd.
353. G E I Industrial Systems Ltd.
354. G H C L Ltd.
355. G M Breweries Ltd.
356. G M R Industries Ltd.
357. G R Cables Ltd.
358. G S L Nova Petrochemicals Ltd.
359. G T L Ltd.
360. G T N Industries Ltd.
361. G V Films Ltd.
362. Gabriel India Ltd.
363. Galada Power & Telecommunication Ltd.
364. Gamma Infoway Exalt Ltd.
365. Gammon India Ltd.
366. Gandhi Special Tubes Ltd.

367. Gangotri Textiles Ltd.
368. Garden Silk Mills Ltd.
369. Garnet Construction Ltd.
370. Garware Offshore Services Ltd.
371. Garware Polyester Ltd.
372. Garware-Wall Ropes Ltd.
373. Gennex Laboratories Ltd.
374. Genus Power Infrastructures Ltd.
375. Geometric Ltd.
376. Gillette India Ltd.
377. Gini Silk Mills Ltd.
378. Ginni Filaments Ltd.
379. Glaxosmithkline Consumer Healthcare Ltd.
380. Glaxosmithkline Pharmaceuticals Ltd.
381. Glenmark Pharmaceuticals Ltd.
382. Globsyn Infotech Ltd.
383. Goa Carbon Ltd.
384. Godfrey Phillips India Ltd.
385. Godrej Industries Ltd.
386. Golden Tobacco Ltd.
387. Goldiam International Ltd.
388. Goldstone Technologies Ltd.
389. Golkunda Diamonds & Jewellery Ltd.
390. Gontermann-Peipers (India) Ltd.
391. Goodricke Group Ltd.
392. Goodyear India Ltd.
393. Govind Rubber Ltd.
394. Graphite India Ltd.
395. Grasim Industries Ltd.
396. Grauer & Weil (India) Ltd.
397. Gravity (India) Ltd.
398. Great Eastern Shipping Co. Ltd.
399. Greaves Cotton Ltd.
400. Greenply Industries Ltd.
401. Grindwell Norton Ltd.
402. Gujarat Alkalies & Chemicals Ltd.
403. Gujarat Ambuja Exports Ltd.
404. Gujarat Apollo Inds. Ltd.
405. Gujarat Borosil Ltd.
406. Gujarat Fluorochemicals Ltd.
407. Gujarat Gas Co. Ltd.
408. Gujarat Hotels Ltd.
409. Gujarat Industries Power Co. Ltd.
410. Gujarat Mineral Devp. Corpn. Ltd.
411. Gujarat N R E Coke Ltd.
412. Gujarat Narmada Valley Fertilizers Co. Ltd.
413. Gujarat Petrosynthese Ltd.
414. Gujarat Sidhee Cement Ltd.
415. Gujarat State Fertilizers & Chemicals Ltd.
416. Gujarat Themis Biosyn Ltd.
417. H B L Power Systems Ltd.
418. H C L Infosystems Ltd.
419. H C L Technologies Ltd.
420. H E G Ltd.
421. H F C L Infotel Ltd.
422. H K Finechem Ltd.
423. H M T Ltd.
424. H P Cotton Textile Mills Ltd.
425. H S India Ltd.
426. Haldyn Glass Gujarat Ltd.
427. Halonix Ltd.
428. Harrisons Malayalam Ltd.
429. Haryana Leather Chemicals Ltd.
430. Hathway Bhawani Cabletel & Datacom Ltd.
431. Havells India Ltd.
432. Heidelberg Cement India Ltd.
433. Heritage Foods (India) Ltd.
434. Hero Honda Motors Ltd.
435. Hester Biosciences Ltd.
436. Hexaware Technologies Ltd.
437. Hi-Tech Gears Ltd.
438. Hikal Ltd.
439. Himachal Futuristic Communications Ltd.
440. Himadri Chemicals & Inds. Ltd.
441. Himalya International Ltd.
442. Himatsingka Seide Ltd.
443. Hinafil India Ltd.
444. Hind Aluminium Inds. Ltd.
445. Hind Syntex Ltd.
446. Hindalco Industries Ltd.
447. Hindoostan Spinning & Wvg. Mills Ltd.
448. Hinduja Foundries Ltd.
449. Hinduja Ventures Ltd.
450. Hindustan Construction Co. Ltd.
451. Hindustan Dorr-Oliver Ltd.
452. Hindustan Hardy Spicer Ltd.
453. Hindustan Motors Ltd.
454. Hindustan Oil Exploration Co. Ltd.
455. Hindustan Organic Chemicals Ltd.

456. Hindustan Petroleum Corpn. Ltd.
457. Hindustan Unilever Ltd.
458. Hindustan Zinc Ltd.
459. Hipolin Ltd.
460. Hiran Orgochem Ltd.
461. Hitachi Home & Life Solutions (India) Ltd.
462. Hitech Plast Ltd.
463. Honda Siel Power Products Ltd.
464. Honeywell Automation India Ltd.
465. Hotel Leelaventure Ltd.
466. Hotline Glass Ltd.
467. Hyderabad Flextech Ltd. [Merged]
468. Hyderabad Industries Ltd.
469. Hytone Texstyles Ltd.
470. I C S A (India) Ltd.
471. I E C Education Ltd.
472. I F B Industries Ltd.
473. I G Petrochemicals Ltd.
474. I M P Powers Ltd.
475. I P Rings Ltd.
476. I S M T Ltd.
477. I T C Ltd.
478. I T I Ltd.
479. I V R C L Infrastructures & Projects Ltd.
480. Igarashi Motors India Ltd.
481. In House Productions Ltd.
482. Ind Tra Deco Ltd.
483. Ind-Swift Laboratories Ltd.
484. Ind-Swift Ltd.
485. Indage Vintners Ltd.
486. India Cements Capital Ltd.
487. India Cements Ltd.
488. India Foils Ltd.
489. India Gelatine & Chemicals Ltd.
490. India Glycols Ltd.
491. India Nippon Electricals Ltd.
492. India Steel Works Ltd.
493. Indian Acrylics Ltd.
494. Indian Card Clothing Co. Ltd.
495. Indian Hotels Co. Ltd.
496. Indian Hume Pipe Co. Ltd.
497. Indian Oil Corpn. Ltd.
498. Indian Toners & Developers Ltd.
499. Indo Bonito Multinational Ltd.
500. Indo Count Inds. Ltd.
501. Indo Rama Synthetics (India) Ltd.
502. Indo-City Infotech Ltd.
503. Indokem Ltd.
504. Indraprastha Medical Corpn. Ltd.
505. Indrayani Biotech Ltd.
506. Indsil Hydro Power & Manganese Ltd.
507. Ineos A B S (India) Ltd.
508. Info-Drive Software Ltd.
509. Infomedia 18 Ltd.
510. Infosys Technologies Ltd.
511. Infotech Enterprises Ltd.
512. Infotrek Syscom Ltd.
513. Ingersoll-Rand (India) Ltd.
514. Innocorp Ltd.
515. Insilco Ltd.
516. Integra India Group Co. Ltd.
517. Integrated Hitech Ltd.
518. Intellvisions Software Ltd.
519. Intensive Air Systems Ltd.
520. Interfit Techno Products Ltd.
521. International Hometex Ltd.
522. International Travel House Ltd.
523. Inwinex Pharmaceuticals Ltd.
524. Ion Exchange (India) Ltd.
525. Ipca Laboratories Ltd.
526. Ispat Industries Ltd.
527. J B Chemicals & Pharmaceuticals Ltd.
528. J B F Industries Ltd.
529. J C T Electronics Ltd.
530. J C T Ltd.
531. J D Orgochem Ltd.
532. J I K Industries Ltd.
533. J J Exporters Ltd.
534. J K Lakshmi Cement Ltd.
535. J K Tyre & Inds. Ltd.
536. J L Morison (India) Ltd.
537. J M C Projects (India) Ltd.
538. J M T Auto Ltd.
539. J S W Steel Ltd.
540. Jagson Airlines Ltd.
541. Jai Corp Ltd.
542. Jain Irrigation Systems Ltd.
543. Jain Studios Ltd.
544. Jaipan Industries Ltd.
545. Jay Bharat Maruti Ltd.
546. Jay Shree Tea & Inds. Ltd.
547. Jay Ushin Ltd.
548. Jayant Agro-Organics Ltd.

549. Jayaswal Neco Inds. Ltd.
550. Jenburkt Pharmaceuticals Ltd.
551. Jenson & Nicholson (India) Ltd.
552. Jetking Infotrain Ltd.
553. Jhagadia Copper Ltd.
554. Jhaveri Flexo India Ltd.
555. Jindal Drilling & Inds. Ltd.
556. Jindal Hotels Ltd.
557. Jindal Poly Films Ltd.
558. Jindal Saw Ltd.
559. Jindal Steel & Power Ltd.
560. Jog Engineering Ltd.
561. Jubilant Organosys Ltd.
562. Jupiter Bioscience Ltd.
563. Jyoti Cosmetics (Exim) Ltd.
564. Jyoti Ltd. (Duplicate Name, Gujarat)
565. Jyoti Overseas Ltd.
566. Jyoti Resins & Adhesives Ltd.
567. Jyoti Structures Ltd.
568. K D D L Ltd.
569. K D L Biotech Ltd.
570. K G Denim Ltd.
571. K L G Systel Ltd.
572. K L R F Ltd.
573. K R B L Ltd.
574. K S B Pumps Ltd.
575. Kaashyap Technologies Ltd.
576. Kabra Extrusiontechnik Ltd.
577. Kajaria Ceramics Ltd.
578. Kakatiya Cement Sugar & Inds. Ltd.
579. Kale Consultants Ltd.
580. Kaleidoscope Films Ltd.
581. Kalindee Rail Nirman (Engineers) Ltd.
582. Kalpena Industries Ltd.
583. Kalyani Steels Ltd.
584. Kamat Hotels (India) Ltd.
585. Kandagiri Spinning Mills Ltd.
586. Kanpur Plastipack Ltd.
587. Kansai Nerolac Paints Ltd.
588. Karan Woo-Sin Ltd.
589. Karma Ispat Ltd.
590. Karuturi Global Ltd.
591. Kashyap Tele-Medicines Ltd.
592. Kay Power & Paper Ltd.
593. Keltech Energies Ltd.
594. Kemrock Industries & Exports Ltd.
595. Kennametal India Ltd.
596. Kerala Ayurveda Ltd.
597. Kesar Enterprises Ltd.
598. Kesoram Industries Ltd.
599. Khoday India Ltd.
600. Khyati Multimedia Entertainment Ltd.
601. Kilburn Chemicals Ltd.
602. Kilitch Drugs (India) Ltd.
603. Kinetic Engineering Ltd.
604. Kinetic Motor Co. Ltd.
605. Kiran Print-Pack Ltd.
606. Kirloskar Brothers Ltd.
607. Kirloskar Ferrous Inds. Ltd.
608. Kirloskar Industries Ltd.
609. Kisan Mouldings Ltd.
610. Kohinoor Foods Ltd.
611. Konark Synthetic Ltd.
612. Konkan Tyres Ltd.
613. Kopran Ltd.
614. Kothari Fermentation & Biochem Ltd.
615. Kothari Products Ltd.
616. Krebs Biochemicals & Inds. Ltd.
617. Krishna Lifestyle Technologies Ltd.
618. Kriti Industries (India) Ltd.
619. Krypton Industries Ltd.
620. Kunststoffe Industries Ltd.
621. L M L Ltd.
622. L N Polyesters Ltd.
623. La Opala R G Ltd.
624. Laffans Petrochemicals Ltd.
625. Lahoti Overseas Ltd.
626. Lakshmi Energy & Foods Ltd.
627. Lakshmi Machine Works Ltd.
628. Lakshmi Precision Screws Ltd.
629. Larsen & Toubro Ltd.
630. Lee & Nee Softwares (Exports) Ltd.
631. Liberty Shoes Ltd.
632. Linaks Microelectronics Ltd.
633. Linc Pen & Plastics Ltd.
634. Lincoln Pharmaceuticals Ltd.
635. Link Pharma Chem Ltd.
636. Lippi Systems Ltd.
637. Lloyds Steel Inds. Ltd.
638. Lok Housing & Constructions Ltd.
639. Lotus Chocolate Co. Ltd.
640. Lupin Ltd.
641. Lyka Labs Ltd.
642. M C S Ltd.

643. M M Forgings Ltd.
644. M M Rubber Co. Ltd.
645. M P Agro Inds. Ltd.
646. M R F Ltd.
647. Maars Software International Ltd.
648. Machino Plastics Ltd.
649. Madhav Marbles & Granites Ltd.
650. Madhusudan Industries Ltd.
651. Madras Cements Ltd.
652. Mafatlal Industries Ltd.
653. Magnum Ltd.
654. Mahan Industries Ltd.
655. Mahanagar Telephone Nigam Ltd.
656. Maharashtra Scooters Ltd.
657. Maharashtra Seamless Ltd.
658. Mahindra & Mahindra Ltd.
659. Mahindra Composites Ltd.
660. Mahindra Ugine Steel Co. Ltd.
661. Majestic Auto Ltd.
662. Makers Laboratories Ltd.
663. Man Industries (India) Ltd.
664. Manali Petrochemical Ltd.
665. Mangalam Cement Ltd.
666. Mangalam Timber Products Ltd.
667. Mangalore Chemicals & Fertilizers Ltd.
668. Mangalore Refinery & Petrochemicals Ltd.
669. Mangalya Soft-Tech Ltd.
670. Manugraph India Ltd.
671. Maral Overseas Ltd.
672. Marathon Nextgen Realty Ltd.
673. Marico Ltd.
674. Marksans Pharma Ltd.
675. Marson's Ltd.
676. Mascon Global Ltd.
677. Mastek Ltd.
678. Mavi Industries Ltd.
679. Max India Ltd.
680. Maximaa Systems Ltd.
681. Mayur Floorings Ltd.
682. Medi-Caps Ltd.
683. Mega Corporation Ltd.
684. Melstar Information Technologies Ltd.
685. Menon Bearings Ltd.
686. Mercator Lines Ltd.
687. Merck Ltd.
688. Metalman Industries Ltd.
689. Metrochem Industries Ltd.
690. Milkfood Ltd.
691. Millennium Cybertech Ltd.
692. Milton Plastics Ltd.
693. Mindteck (India) Ltd.
694. Mirc Electronics Ltd.
695. Mirza International Ltd.
696. Mobile Telecommunications Ltd.
697. Modern Dairies Ltd.
698. Modipon Ltd.
699. Mold-Tek Technologies Ltd.
700. Monozyme India Ltd.
701. Monsanto India Ltd.
702. Morepen Laboratories Ltd.
703. Morganite Crucible (India) Ltd.
704. Moser Baer India Ltd.
705. Motherson Sumi Systems Ltd.
706. Mount Everest Mineral Water Ltd.
707. Mphasis Ltd.
708. Mukand Engineers Ltd.
709. Mukand Ltd.
710. Mukat Pipes Ltd.
711. Muller & Phipps (India) Ltd.
712. Multibase India Ltd.
713. Munjal Auto Inds. Ltd.
714. Munjal Showa Ltd.
715. Murli Industries Ltd.
716. My Fair Lady Ltd.
717. Mysore Paper Mills Ltd.
718. Mysore Petro Chemicals Ltd.
719. N C L Industries Ltd.
720. N G L Fine-Chem Ltd.
721. N I I T Ltd.
722. N K Industries Ltd.
723. N R Agarwal Inds. Ltd.
724. N R B Bearings Ltd.
725. N R C Ltd.
726. Nagarjuna Agrichem Ltd.
727. Nagarjuna Construction Co. Ltd.
728. Nagarjuna Fertilizers & Chemicals Ltd.
729. Nagreeka Exports Ltd.
730. Nahar Industrial Enterprises Ltd.
731. Nahar Poly Films Ltd.
732. Nahar Spinning Mills Ltd.
733. Nakoda Ltd.
734. Narmada Gelatines Ltd.
735. Natco Pharma Ltd.
736. Nath Pulp & Paper Mills Ltd.
737. National Aluminium Co. Ltd.

738. National Peroxide Ltd.
739. National Plastic Inds. Ltd.
740. National Plastic Technologies Ltd.
741. National Steel & Agro Inds. Ltd.
742. Natural Capsules Ltd.
743. Nava Bharat Ventures Ltd.
744. Navneet Publications (India) Ltd.
745. Nelco Ltd.
746. Neo Corp Intl. Ltd.
747. Nestle India Ltd.
748. Nettlinx Ltd.
749. Network Ltd.
750. Neuland Laboratories Ltd.
751. Neyveli Lignite Corpn. Ltd.
752. Nicco Parks & Resorts Ltd.
753. Nikhil Adhesives Ltd.
754. Nilkamal Ltd.
755. Nippo Batteries Co. Ltd.
756. Nirlon Ltd.
757. Nirma Ltd.
758. Nitta Gelatin India Ltd.
759. Noble Explochem Ltd.
760. Nocil Ltd.
761. Noida Medicare Centre Ltd.
762. Novartis India Ltd.
763. Nucent Estates Ltd.
764. Nuchem Ltd.
765. Nucleus Software Exports Ltd.
766. C L India Ltd.
767. R G Informatics Ltd.
768. Odyssey Technologies Ltd.
769. Oil & Natural Gas Corpn. Ltd.
770. Oil Country Tubular Ltd.
771. Omax Autos Ltd.
772. Omega Interactive Technologies Ltd.
773. Omnitex Industries (India) Ltd.
774. Onward Technologies Ltd.
775. Orchid Chemicals & Pharmaceuticals Ltd.
776. Organic Coatings Ltd.
777. Oricon Enterprises Ltd.
778. Orient Ceramics & Inds. Ltd.
779. Orient Paper & Inds. Ltd.
780. Oriental Carbon & Chemicals Ltd.
781. Oriental Hotels Ltd.
782. Oscar Global Ltd.
783. Oudh Sugar Mills Ltd.
784. Oxford Industries Ltd.
785. P A E Ltd.
786. P B M Polytex Ltd.
787. P C S Technology Ltd.
788. P G Foils Ltd.
789. P S L Ltd.
790. P V P Ventures Ltd.
791. Pacific Cotspin Ltd.
792. Pan India Corpn. Ltd.
793. Panacea Biotec Ltd.
794. Panama Petrochem Ltd.
795. Panasonic Carbon India Co. Ltd.
796. Panasonic Energy India Co. Ltd.
797. Panasonic Home Appliances India Co. Ltd.
798. Panchmahal Steel Ltd.
799. Pankaj Polymers Ltd.
800. Panoramic Universal Ltd.
801. Pantaloon Retail (India) Ltd.
802. Panyam Cements & Mineral Inds. Ltd.
803. Paper Products Ltd.
804. Paramount Communications Ltd.
805. Parekh Platinum Ltd.
806. Parenteral Drugs (India) Ltd.
807. Pasupati Acrylon Ltd.
808. Patel Integrated Logistics Ltd.
809. Patspin India Ltd.
810. Peacock Industries Ltd.
811. Pearl Global Ltd.
812. Pearl Polymers Ltd.
813. Pee Cee Cosma Sope Ltd.
814. Peninsula Land Ltd.
815. Pennar Aluminium Co. Ltd.
816. Pennar Industries Ltd.
817. Pentamedia Graphics Ltd.
818. Petron Engineering Construction Ltd.
819. Pfizer Ltd.
820. Phillips Carbon Black Ltd.
821. Phoenix Mills Ltd.
822. Photoquip (India) Ltd.
823. Phyto Chem (India) Ltd.
824. Pidilite Industries Ltd.
825. Pioneer Embroideries Ltd.
826. Piramal Healthcare Ltd.
827. Pix Transmissions Ltd.
828. Plastiblends India Ltd.
829. Platinum Corporation Ltd.
830. Poddar Developers Ltd.
831. Poddar Pigments Ltd.
832. Polaris Software Lab Ltd.

833. Polychem Ltd.
834. Polycon International Ltd.
835. Polygenta Technologies Ltd.
836. Polymechplast Machines Ltd.
837. Polyplex Corporation Ltd.
838. Pradeep Metals Ltd.
839. Prag Bosimi Synthetics Ltd.
840. Precision Containeurs Ltd.
841. Precision Electronics Ltd.
842. Precision Wires India Ltd.
843. Premier Explosives Ltd.
844. Premier Ltd.
845. Prima Plastics Ltd.
846. Prime Textiles Ltd.
847. Prism Cement Ltd.
848. Priya Ltd.
849. Procal Electronics India Ltd.
850. Procter & Gamble Hygiene & Health Care Ltd.
851. Prraneta Industries Ltd.
852. Pudumjee Industries Ltd.
853. Pudumjee Pulp & Paper Mills Ltd.
854. Puneet Resins Ltd.
855. Punjab Chemicals & Crop Protection Ltd.
856. Punjab Communications Ltd.
857. R L F Ltd.
858. R P G Cables Ltd. [Merged]
859. R S Software (India) Ltd.
860. R S W M Ltd.
861. R T Exports Ltd.
862. Raasi Refractories Ltd.
863. Raghunath International Ltd.
864. Rain Commodities Ltd.
865. Rainbow Papers Ltd.
866. Raj Agro Mills Ltd.
867. Rajesh Exports Ltd.
868. Rajratan Global Wire Ltd.
869. Rajshree Sugars & Chemicals Ltd.
870. Rallis India Ltd.
871. Ram Informatics Ltd.
872. Ram Ratna Wires Ltd.
873. Rama Newsprint & Papers Ltd.
874. Rama Paper Mills Ltd.
875. Rama Petrochemicals Ltd.
876. Rama Phosphates Ltd.
877. Rama Vision Ltd.
878. Rana Sugars Ltd.
879. Ranbaxy Laboratories Ltd.
880. Rapicut Carbides Ltd.
881. Ras Extrusions Ltd.
882. Ras Propack Lamipack Ltd.
883. Rasandik Engineering Inds. India Ltd.
884. Rashtriya Chemicals & Fertilizers Ltd.
885. Rasoi Ltd.
886. Rathi Graphic Technologies Ltd.
887. Ravalgaon Sugar Farm Ltd.
888. Raymond Floriculture & Agrotech (India) Ltd.
889. Raymond Ltd.
890. Refnol Resins & Chemicals Ltd.
891. Regency Ceramics Ltd.
892. Rei Agro Ltd.
893. Reliance Industrial Infrastructure Ltd.
894. Reliance Industries Ltd.
895. Reliance Infrastructure Ltd.
896. Religare Technova Global Solutions Ltd.
897. Religare Technova Ltd.
898. Remi Metals Gujarat Ltd.
899. Resonance Specialties Ltd.
900. Revathi Equipment Ltd.
901. Rexnord Electronics & Controls Ltd.
902. Richirich Inventures Ltd.
903. Rico Auto Inds. Ltd.
904. Ricoh India Ltd.
905. Riga Sugar Co. Ltd.
906. Rishi Laser Ltd.
907. Rishi Packers Ltd.
908. Rishiroop Rubber (International) Ltd.
909. Ritesh Properties & Inds. Ltd.
910. Rollatainers Ltd.
911. Rolta India Ltd.
912. Roselabs Industries Ltd.
913. Roto Pumps Ltd.
914. Royal Cushion Vinyl Products Ltd.
915. Royale Manor Hotels & Inds. Ltd.
916. Rubber Products Ltd.
917. Rubfila International Ltd.
918. Ruchi Soya Inds. Ltd.
919. Ruchi Strips & Alloys Ltd.
920. S B & T International Ltd.
921. S I P Industries Ltd.
922. S K F India Ltd.
923. S Kumars Nationwide Ltd.

924. S P E L Semiconductor Ltd.
925. S P S International Ltd.
926. S Q L Star International Ltd.
927. S R F Ltd.
928. S R H H L Industries Ltd.
929. S S Organics Ltd.
930. S V C Superchem Ltd.
931. Sabero Organics Gujarat Ltd.
932. Safari Industries (India) Ltd.
933. Sagar Cements Ltd.
934. Sahara One Media & Entertainment Ltd.
935. Saint-Gobain Sekurit India Ltd.
936. Sakthi Sugars Ltd.
937. Salora International Ltd.
938. Sambandam Spinning Mills Ltd.
939. Sambhaav Media Ltd.
940. Samkrg Pistons & Rings Ltd.
941. Samrat Pharmachem Ltd.
942. Samtel Color Ltd.
943. Samtel India Ltd.
944. Sandesh Ltd.
945. Sandu Pharmaceuticals Ltd.
946. Sanghvi Movers Ltd.
947. Santosh Fine-Fab Ltd.
948. Sarang Chemicals Ltd.
949. Sarda Energy & Minerals Ltd.
950. Sarda Plywood Inds. Ltd.
951. Saregama India Ltd.
952. Sarup Tanneries Ltd.
953. Sathavahana Ispat Ltd.
954. Satyam Computer Services Ltd.
955. Saurashtra Cement Ltd.
956. Savita Oil Technologies Ltd.
957. Sayaji Hotels Ltd.
958. Scanpoint Geomatics Ltd.
959. Schlafhorst Engineering (India) Ltd.
960. Scindia Steam Navigation Co. Ltd.
961. Scooters India Ltd.
962. Seamec Ltd.
963. Seasons Textiles Ltd.
964. Selan Exploration Technology Ltd.
965. Sesa Goa Ltd.
966. Seshachal Technologies Ltd.
967. Shah Alloys Ltd.
968. Shamken Cotsyn Ltd.
969. Shamken Multifab Ltd.
970. Shamken Spinners Ltd.
971. Shanthi Gears Ltd.
972. Sharp India Ltd.
973. Shasun Chemicals & Drugs Ltd.
974. Shetron Ltd.
975. Shilp Gravures Ltd.
976. Shipping Corpn. Of India Ltd.
977. Shiv-Vani Oil & Gas Exploration Services Ltd.
978. Shiva Fertilizers Ltd.
979. Shiva Texyarn Ltd.
980. Shree Cement Ltd.
981. Shree Digvijay Cement Co. Ltd.
982. Shree Pacetronix Ltd.
983. Shree Rama Multi-Tech Ltd.
984. Shree Vaani Sugars & Inds. Ltd.
985. Shrenuj & Co. Ltd.
986. Shreyans Industries Ltd.
987. Shreyas Shipping & Logistics Ltd.
988. Shri Dinesh Mills Ltd.
989. Shri Lakshmi Cotsyn Ltd.
990. Shyam Star Gems Ltd.
991. Shyam Telecom Ltd.
992. Sical Logistics Ltd.
993. Siemens Healthcare Diagnostics Ltd.
994. Siemens Ltd.
995. Silicon Valley Infotech Ltd.
996. Silktex Ltd.
997. Silver Smith India Ltd.
998. Silverline Technologies Ltd.
999. Simmonds Marshall Ltd.
1000. Simplex Castings Ltd.
1001. Simran Farms Ltd.
1002. Sirpur Paper Mills Ltd.
1003. Sita Enterprises Ltd.
1004. Siyaram Silk Mills Ltd.
1005. Socrus Bio Sciences Ltd.
1006. Software Technology Group International Ltd.
1007. Solitaire Machine Tools Ltd.
1008. Som Distilleries & Breweries Ltd.
1009. Soma Textiles & Inds. Ltd.
1010. Somany Ceramics Ltd.
1011. Sonata Software Ltd.
1012. Southern Petrochemical Inds. Corpn. Ltd.
1013. Spanco Ltd.
1014. Spectra Industries Ltd.
1015. Spentex Industries Ltd.
1016. Spice Islands Apparels Ltd.
1017. Spicejet Ltd.

1018. Sree Rayalaseema Alkalies & Allied Chemicals Ltd.
1019. Sri Adhikari Brothers Television Network Ltd.
1020. Sriven Multi-Tech Ltd.
1021. Standard Industries Ltd.
1022. Star Paper Mills Ltd.
1023. State Trading Corpn. Of India Ltd.
1024. Steel Authority Of India Ltd.
1025. Steel Strips Infrastructures Ltd.
1026. Steel Strips Wheels Ltd.
1027. Steelco Gujarat Ltd.
1028. Sterling Biotech Ltd.
1029. Sterling International Enterprises Ltd.
1030. Sterlite Industries (India) Ltd.
1031. Stone India Ltd.
1032. Stovec Industries Ltd.
1033. Stresscrete India Ltd.
1034. Stylam Industries Ltd.
1035. Su-Raj Diamonds & Jewellery Ltd.
1036. Suashish Diamonds Ltd.
1037. Suave Hotels Ltd.
1038. Subros Ltd.
1039. Sudarshan Chemical Inds. Ltd.
1040. Suditi Industries Ltd.
1041. Sumeet Industries Ltd.
1042. Sun Pharmaceutical Inds. Ltd.
1043. Sundram Fasteners Ltd.
1044. Sunflag Iron & Steel Co. Ltd.
1045. Sunshield Chemicals Ltd.
1046. Super Tannery Ltd.
1047. Superhouse Ltd.
1048. Supertex Industries Ltd.
1049. Supreme Industries Ltd.
1050. Supreme Petrochem Ltd.
1051. Surana Telecom & Power Ltd.
1052. Surat Textile Mills Ltd.
1053. Surya Roshni Ltd.
1054. Suryajyoti Spinning Mills Ltd.
1055. Suryavanshi Spinning Mills Ltd.
1056. Suven Life Sciences Ltd.
1057. Swaraj Engines Ltd.
1058. Swaraj Mazda Ltd.
1059. Switching Technologies Gunther Ltd.
1060. Symphony Comfort Systems Ltd.
1061. Syncom Formulations (India) Ltd.
1062. T & I Global Ltd.
1063. T C P L Packaging Ltd.
1064. T I L Ltd.
1065. T T K Healthcare Ltd.
1066. T T K Prestige Ltd.
1067. T V S Motor Co. Ltd.
1068. T V S Srichakra Ltd.
1069. Tai Industries Ltd.
1070. Tamil Nadu Newsprint & Papers Ltd.
1071. Tamilnadu Petroproducts Ltd.
1072. Tamilnadu Telecommunications Ltd.
1073. Taneja Aerospace & Aviation Ltd.
1074. Tanfac Industries Ltd.
1075. Tarai Foods Ltd.
1076. Tasty Bite Eatables Ltd.
1077. Tata Chemicals Ltd.
1078. Tata Communications Ltd.
1079. Tata Elxsi Ltd.
1080. Tata Metaliks Ltd.
1081. Tata Motors Ltd.
1082. Tata Power Co. Ltd.
1083. Tata Sponge Iron Ltd.
1084. Tata Steel Ltd.
1085. Tata Tea Ltd.
1086. Tayo Rolls Ltd.
1087. Techtran Polylenses Ltd.
1088. Television Eighteen India Ltd.
1089. Texmaco Ltd.
1090. Themis Medicare Ltd.
1091. Thermax Ltd.
1092. Thirumalai Chemicals Ltd.
1093. Thomas Cook (India) Ltd.
1094. Tilaknagar Industries Ltd.
1095. Timex Group India Ltd.
1096. Timken India Ltd.
1097. Tinplate Co. Of India Ltd.
1098. Titan Bio-Tech Ltd.
1099. Titan Industries Ltd.
1100. Today's Writing Products Ltd.
1101. Tokyo Plast International Ltd.
1102. Tonira Pharma Ltd.
1103. Torrent Cables Ltd.
1104. Torrent Pharmaceuticals Ltd.
1105. Toyama Electric Ltd.
1106. Trans Freight Containers Ltd.
1107. Transchem Ltd.
1108. Transpek Industry Ltd.
1109. Trend Electronics Ltd.
1110. Trent Ltd.

1111. Tricom India Ltd.
1112. Trigyn Technologies Ltd.
1113. Tube Investments Of India Ltd.
1114. Tutis Technologies Ltd.
1115. Twilight Litaka Pharma Ltd.
1116. Twinstar Industries Ltd.
1117. Tyroon Tea Co. Ltd.
1118. U B Engineering Ltd.
1119. Ucal Fuel Systems Ltd.
1120. Uflex Ltd.
1121. Ugar Sugar Works Ltd.
1122. Ultramarine & Pigments Ltd.
1123. Umang Dairies Ltd.
1124. Uni Abex Alloy Products Ltd.
1125. Unichem Laboratories Ltd.
1126. Uniflex Cables Ltd.
1127. Unimers India Ltd.
1128. Unimin India Ltd.
1129. Uniphos Enterprises Ltd.
1130. Unitech Ltd.
1131. United Breweries (Holdings) Ltd.
1132. United Phosphorus Ltd.
1133. Universal Cables Ltd.
1134. Universal Office Automation Ltd.
1135. Unjha Formulations Ltd.
1136. Usha Martin Ltd.
1137. Ushdev International Ltd.
1138. Uttam Galva Steels Ltd.
1139. V I P Industries Ltd.
1140. V S T Industries Ltd.
1141. V S T Tillers Tractors Ltd.
1142. V X L Instruments Ltd.
1143. Vadilal Enterprises Ltd.
1144. Vadilal Industries Ltd.
1145. Vaibhav Gems Ltd.
1146. Vakrangee Softwares Ltd.
1147. Valiant Communications Ltd.
1148. Value Industries Ltd.
1149. Vamshi Rubber Ltd.
1150. Vapi Paper Mills Ltd.
1151. Vardhman Polytex Ltd.
1152. Vardhman Textiles Ltd.
1153. Varun Shipping Co. Ltd.
1154. Venky's (India) Ltd.
1155. Venlon Enterprises Ltd.
1156. Venus Remedies Ltd.
1157. Venus Sugar Ltd.
1158. Venus Universal Ltd.
1159. Vesuvius India Ltd.
1160. Viceroy Hotels Ltd.
1161. Videocon Industries Ltd.
1162. Vidhi Dyestuffs Manufacturing Ltd.
1163. Vikas Granaries Ltd.
1164. Vimal Oil & Foods Ltd.
1165. Vinati Organics Ltd.
1166. Vindhya Telelinks Ltd.
1167. Vintron Informatics Ltd.
1168. Vinyl Chemicals India Ltd.
1169. Vippy Industries Ltd.
1170. Vippy Spinpro Ltd.
1171. Vipul Dye Chem Ltd.
1172. Virat Crane Inds. Ltd.
1173. Visaka Industries Ltd.
1174. Vista Pharmaceuticals Ltd.
1175. Voltas Ltd.
1176. Vulcan Engineers Ltd.
1177. W P I L Ltd.
1178. Wadala Commodities Ltd.
1179. Warren Tea Ltd.
1180. Waterbase Ltd.
1181. Websol Energy Systems Ltd.
1182. Weizmann Ltd.
1183. Welspun India Ltd.
1184. Welspun Syntex Ltd.
1185. West Coast Paper Mills Ltd.
1186. Western India Shipyard Ltd.
1187. Whirlpool Of India Ltd.
1188. Wim Plast Ltd.
1189. Windsor Machines Ltd.
1190. Winsome Yarns Ltd.
1191. Wintac Ltd.
1192. Wipro Ltd.
1193. Wires & Fabriks (S.A.) Ltd.
1194. Wockhardt Ltd.
1195. Women Networks Ltd.
1196. Wyeth Ltd.
1197. X O Infotech Ltd.
1198. Yash Papers Ltd.
1199. Yashraj Containeurs Ltd.
1200. Yuken India Ltd.
1201. Z F Steering Gear (India) Ltd.
1202. Zandu Realty Ltd.
1203. Zee Entertainment Enterprises Ltd.
1204. Zenith Birla (India) Ltd.
1205. Zenith Computers Ltd.
1206. Zenith Health Care Ltd.
1207. Zenith Infotech Ltd.
1208. Zensar Technologies Ltd.
1209. Zicom Electronic Security Systems Ltd.

1210. Zodiac Clothing Co. Ltd.
1211. Zodiac-Jrd-Mkj Ltd.
1212. Zuari Industries Ltd.
1213. Zyden Gentec Ltd.

ANNEXURE- II

Table A II.1 Results of fixed effects tests for H1

Regression Equation: $MVA_{it} = \beta_0+\beta_1\ EVA_{it}+ e_{it}$

Test	**Degree of Freedom**	**Statistics**	***p-value***
Cross Section F	995,8963	1.752	0.000
Cross- section Chi -square	995	1770.621	0.000

Regression Equation: $MVA_{it} = \beta_0+\beta_1\ NOPAT_{it}+ e_{it}$

Test	**Degree of Freedom**	**Statistics**	***p-value***
Cross Section F	995,8963	1.774	0.000
Cross- section Chi -square	995	1791.356	0.000

Table A II.2 Results of fixed effects tests for H2

Regression Equation: $MVA_{it} = \beta_0+\beta_1\ EVA_{it} + \beta_2\ EPS_{it} + \beta_3 ROCE_{it} + \beta_4\ RONW_{it}+ \beta_5\ OCF_{it}+ \beta_6\ NOPAT_{it}+ \beta_7\ NI_{it}+ \beta_8\ RI_{it} + e_{it}$

	Degree of Freedom	**Statistics**	***p-value***
Cross Section F	995,8956	1.525	0.000
Cross- section Chi -square	995	1559.485	0.000

Regression Equation: $MVA_{it} = \beta_0+\beta_1\ EVA_{it}+ e_{it}$

	Degree of Freedom	**Statistics**	***p-value***
Cross Section F	995,8963	1.7525	0.000
Cross- section Chi -square	995	1770.621	0.0000

Regression Equation: $MVA_{it} = \beta_0+\beta_1\ EPS_{it} + e_{it}$

	Degree of Freedom	**Statistics**	***p-value***
Cross Section F	995,8963	1.789	0.000
Cross- section Chi -square	995	1804.771	0.000

Regression Equation: $MVA_{it} = \beta_0+\beta_1\ ROCE_{it} + e_{it}$

	Degree of Freedom	**Statistics**	***p-value***
Cross Section F	995,8963	1.824	0.000
Cross- section Chi -square	995	1836.964	0.000

Regression Equation: $MVA_{it} = \beta_0+\beta_1\ RONW_{it} + e_{it}$

	Degree of Freedom	**Statistics**	***p-value***
Cross Section F	995,8963	1.822	0.000
Cross- section Chi -square	995	1835.556	0.000

Table A II.2 Results of fixed effects tests for H2 (contd.)

Regression Equation: $MVA_{it} = \beta_0 + \beta_1\ OCF_{it} + e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8963	1.636	0.000
Cross- section Chi -square	995	1662.465	0.000

Regression Equation: $MVA_{it} = \beta_0 + \beta_1\ NOPAT_{it} + e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8963	1.774	0.000
Cross- section Chi -square	995	1791.356	0.000

Regression Equation: $MVA_{it} = \beta_0 + \beta_1\ NI_{it} + e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8963	1.827	0.000
Cross- section Chi -square	995	1839.503	0.000

Regression Equation: $MVA_{it} = \beta_0 + \beta_1\ RI_{it} + e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8963	1.7456	0.000
Cross- section Chi -square	995	1764.215	0.000

Regression Equation: $MVA_{it} = \beta_0 + \beta_1\ EVA_{it} + \beta_2\ RI_{it} + e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8962	1.721	0.000
Cross- section Chi -square	995	1742.280	0.000

Regression Equation: $MVA_{it} = \beta_0 + \beta_1\ EVA_{it} + \beta_2\ NI_{it} + e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8962	1.755	0.000
Cross- section Chi -square	995	1773.216	0.000

Regression Equation: $MVA_{it} = \beta_0 + \beta_1\ EVA_{it} + \beta_2\ NOPAT_{it} + e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8962	1.707	0.000
Cross- section Chi -square	995	1729.056	0.000

Regression Equation: $MVA_{it} = \beta_0 + \beta_1\ EVA_{it} + \beta_2\ OCF_{it} + e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8962	1.593	0.000
Cross- section Chi -square	995	1622.461	0.000

Regression Equation: $MVA_{it} = \beta_0 + \beta_1\ EVA_{it} + \beta_2\ RONW_{it} + e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8962	1.751	0.000
Cross- section Chi -square	995	1769.464	0.000

Table A II.2 Results of fixed effects tests for H2 (contd.)

Regression Equation: $MVA_{it} = \beta_0+\beta_1\ EVA_{it} + \beta_2\ ROCE_{it} + e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8962	1.752	0.000
Cross- section Chi -square	995	1770.476	0.000

Regression Equation: $MVA_{it} = \beta_0+\beta_1\ EVA_{it} + \beta_2\ EPS_{it} + e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8962	1.712	0.000
Cross- section Chi -square	995	1734.015	0.000

Regression Equation: $MVA_{it} = \beta_0+\beta_1\ EPS_{it} + \beta_2\ RI_{it} + e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8962	1.706487	0.000
Cross- section Chi -square	995	1728.066	0.000

Regression Equation: $MVA_{it} = \beta_0+\beta_1\ EPS_{it} + \beta_2\ NI_{it} + e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8962	1.812	0.000
Cross- section Chi -square	995	1825.820	0.000

Regression Equation: $MVA_{it} = \beta_0+\beta_1\ EPS_{it} + \beta_2\ NOPAT_{it} + e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8962	1.731	0.000
Cross- section Chi -square	995	1751.134	0.000

Regression Equation: $MVA_{it} = \beta_0+\beta_1\ EPS_{it} + \beta_2\ OCF_{it} + e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8962	1.614	0.000
Cross- section Chi -square	995	1642.124	0.000

Regression Equation: $MVA_{it} = \beta_0+\beta_1\ EPS_{it} + \beta_2\ RONW_{it} + e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8962	1.788	0.000
Cross- section Chi -square	995	1803.986	0.000

Regression Equation: $MVA_{it} = \beta_0+\beta_1\ EPS_{it} + \beta_2\ ROCE_{it} + e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8962	1.789	0.000
Cross- section Chi -square	995	1804.746	0.000

Regression Equation: $MVA_{it} = \beta_0+\beta_1 ROCE_{it} + \beta_2\ RI_{it} + e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8962	1.826	0.000
Cross- section Chi -square	995	1839.469	0.000

Table A II.2 Results of fixed effects tests for H2 (contd.)

Regression Equation: $MVA_{it} = \beta_0 + \beta_1 ROCE_{it} + \beta_2 NOPAT_{it} + e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8962	1.774	0.000
Cross- section Chi -square	995	1790.888	0.000

Regression Equation: $MVA_{it} = \beta_0 + \beta_1 ROCE_{it} + \beta_2 OCF_{it} + e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8962	1.636	0.000
Cross- section Chi -square	995	1662.425	0.000

Regression Equation: $MVA_{it} = \beta_0 + \beta_1 ROCE_{it} + \beta_2 RONW_{it} + e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8962	1.822	0.000
Cross- section Chi -square	995	1835.453	0.000

Regression Equation: $MVA_{it} = \beta_0 + \beta_1 RONW_{it} + \beta_2 RI_{it} + e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8962	1.744	0.000
Cross- section Chi -square	995	1763.106	0.000

Regression Equation: $MVA_{it} = \beta_0 + \beta_1 RONW_{it} + \beta_2 NI_{it} + e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8962	1.825	0.000
Cross- section Chi -square	995	1838.100	0.000

Regression Equation: $MVA_{it} = \beta_0 + \beta_1 RONW_{it} + \beta_2 NOPAT_{it} + e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8962	1.773	0.000
Cross- section Chi -square	995	1789.729	0.000

Regression Equation: $MVA_{it} = \beta_0 + \beta_1 RONW_{it} + \beta_2 OCF_{it} + e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8962	1.634	0.000
Cross- section Chi -square	995	1661.380	0.000

Regression Equation: $MVA_{it} = \beta_0 + \beta_1 OCF_{it} + \beta_2 RI_{it} + e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8962	1.592	0.000
Cross- section Chi -square	995	1621.087	0.000

Regression Equation: $MVA_{it} = \beta_0 + \beta_1 OCF_{it} + \beta_2 NI_{it} + e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8962	1.645247	0.000
Cross- section Chi -square	995	1670.971	0.000

Table A II.2 Results of fixed effects tests for H2 (contd.)

Regression Equation: $MVA_{it} = \beta_0+\beta_1 OCF_{it} + \beta_2 NOPAT_{it} + e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8962	1.633	0.000
Cross- section Chi -square	995	1660.197	0.000

Regression Equation: $MVA_{it} = \beta_0+\beta_1 NOPAT_{it} + \beta_2 RI_{it} + e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8962	1.700	0.000
Cross- section Chi -square	995	1722.340	0.000

Regression Equation: $MVA_{it} = \beta_0+\beta_1 NOPAT_{it} + \beta_2 NI_{it} + e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8962	1.625	0.000
Cross- section Chi -square	995	1652.621	0.000

Regression Equation: $MVA_{it} = \beta_0+\beta_1 NI_{it} + \beta_2 RI_{it} + e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8962	1.749	0.000
Cross- section Chi -square	995	1767.609	0.000

Table A II.3 Results of fixed effects tests for H3

Regression Equation: $EVA_{it} = \beta_0+\beta_1\ OCF_{it} + e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8963	1.100	0.019
Cross- section Chi -square	995	1148.241	0.000

Regression Equation: $EVA_{it} = \beta_0+\beta_1 ACC_{it} + e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8963	1.112	0.010
Cross- section Chi -square	995	1160.304	0.000

Regression Equation: $EVA_{it} = \beta_0+\beta_1 ATI_{it} + e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8963	1.126	0.005
Cross- section Chi -square	995	1173.348	0.000

Regression Equation: $EVA_{it} = \beta_0+\beta_1 CC_{it} + e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8963	1.150	0.001
Cross- section Chi -square	995	1197.424	0.000

Regression Equation: $EVA_{it} = \beta_0+\beta_1 ADJ_{it} + e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8963	1.127	0.004
Cross- section Chi -square	995	1175.043	0.000

Table A II.3 Results of fixed effects tests for H3 (contd.)

Regression Equation: $EVA_{it} = \beta_0+\beta_1OCF_{it} + \beta_2ADJ_{it+}\ e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8962	1.089	0.033
Cross- section Chi -square	995	1136.803	0.001

Regression Equation: $EVAit = \beta_0+\beta_1OCF_{it} + \beta_2CC_{it+}\ e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8962	1.105	0.015
Cross- section Chi -square	995	1153.454	0.000

Regression Equation: $EVAit = \beta_0+\beta_1OCF_{it} + \beta_2ATI_{it+}\ e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8962)	1.093	0.027
Cross- section Chi -square	995	1141.091	0.000

Regression Equation: $EVA_{it} = \beta_0+\beta_1OCF_{it} + \beta_2ACC_t + e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8962	1.100	0.019
Cross- section Chi -square	995	1148.442	0.000

Regression Equation: $EVA_{it} = \beta_0+\beta_1ACC_{it} + \beta_2ADJ_{t+}\ e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8962	1.112	0.010
Cross- section Chi -square	995	1160.275	0.000

Regression Equation: $EVA_{it} = \beta_0+\beta_1ACC_{it} + \beta_2CCi_{t+}\ e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8962	1.109	0.012
Cross- section Chi -square	995	1156.828	0.000

Regression Equation: $EVA_{it} = \beta_0+\beta_1ACC_{it} + \beta_2ATI_{it+}\ e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8962	1.102	0.017
Cross- section Chi -square	995	1150.543	0.000

Regression Equation: $EVA_{it} = \beta_0+\beta_1ATI_{it} + \beta_2ADJ_{it+}\ e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8962	1.119	0.007
Cross- section Chi -square	995	1166.838	0.000

Regression Equation: $EVA_{it} = \beta_0+\beta_1ATI_{it} + \beta_2CC_{it+}\ e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8962	1.392	0.000
Cross- section Chi -square	995	1431.337	0.000

Regression Equation: $EVA_{it} = \beta_0+\beta_1CC_{it} + \beta_2ADJ_{it+}\ e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8962	1.134	0.0032
Cross- section Chi -square	995	1181.495	0.0000

Table A II.3 Results of fixed effects tests for H3 (contd.)

Regression Equation: $EVA_{it} = \beta_0+\beta_1\ OCF_{it} + \ \beta_2\ ACC_{it}\ + \beta_3\ ATI_{it} + \ \beta_4\ CC_{it}+\ \beta_5\ ADJ_{it} + e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8959	1.000	0.493
Cross- section Chi -square	995	1049.142	0.113

Regression Equation: $MVA_{it} = \beta_0+\beta_1\ OCF_{it}\ + e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8963)	1.636	0.000
Cross- section Chi -square	995	1662.465	0.000

Regression Equation: $MVA_{it} = \beta_0+\beta_1 ACC_{it}\ + \ e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8963	1.764	0.000
Cross- section Chi -square	995	1781.496	0.0000

Regression Equation: $MVA_{it} = \beta_0+\beta_1 ATI_{it}\ + \ e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8963	1.839	0.000
Cross- section Chi -square	995	1850.975	0.000

Regression Equation: $MVA_{it} = \beta_0+\beta_1 CC_{it}\ + \ e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8963	1.744	0.0000
Cross- section Chi -square	995	1763.297	0.000

Regression Equation: $MVA_{it} = \beta_0+\beta_1 ADJ_{it}\ + \ e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8963	1.779	0.000
Cross- section Chi -square	995	1795.318	0.000

Regression Equation: $MVA_{it} = \beta_0+\beta_1 OCF_{it} + \beta_2 ADJ_{it+}\ e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8962	1.564	0.000
Cross- section Chi -square	995	1595.356	0.000

Regression Equation: $MVA_{it} = \beta_0+\beta_1 OCF_{it} + \beta_2 CC_{it+}\ e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8962	1.591	0.000
Cross- section Chi -square	995	1620.808	0.000

Regression Equation: $MVAit = \beta_0+\beta_1 OCF_{it} + \beta_2 ATI_{it+}\ e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8962	1.649	0.000
Cross- section Chi -square	995	1674.640	0.000

Regression Equation: $MVA_{it} = \beta_0+\beta_1 OCF_{it} + \beta_2 ACC_{it}\ + e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8962	1.633	0.000
Cross- section Chi -square	995	1660.197	0.000

Table A II.3 Results of fixed effects tests for H3 (contd.)

Regression Equation: $MVA_{it} = \beta_0+\beta_1 ACC_{it} + \beta_2 ADJ_{it+} e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8962	1.739	0.000
Cross- section Chi -square	995	1758.821	0.000

Regression Equation: $MVA_{it} = \beta_0+\beta_1 ACC_{it} + \beta_2 CC_{it+} e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8962	1.703	0.000
Cross- section Chi -square	995	1724.989	0.000

Regression Equation: $MVA_{it} = \beta_0+\beta_1 ACC_{it} + \beta_2 ATI_{it+} e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8962	1.767	0.000
Cross- section Chi -square	995	1784.311	0.000

Regression Equation: $MVA_{it} = \beta_0+\beta_1 ATI_{it} + \beta_2 ADJ_{it+} e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8962	1.792	0.000
Cross- section Chi -square	995	1807.757	0.000

Regression Equation: $MVA_{it} = \beta_0+\beta_1 ATI_{it} + \beta_2 CC_{it+} e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8962	1.765	0.000
Cross- section Chi -square	995	1783.030	0.000

Regression Equation: $MVA_{it} = \beta_0+\beta_1 CC_{it} + \beta_2 ADJ_{it+} e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	995,8962	1.707	0.000
Cross- section Chi -square	995	1728.661	0.000

Regression Equation: $MVA_{it} = \beta_0+\beta_1 OCF_{it} + \beta_2 ACC_{it} + \beta_3 ATI_{it} + \beta_4 CC_{it}+ \beta_5 ADJ_{it} + e_{it}$

	Degree of Freedom	Statistics	*p-value*
Cross Section F	(995,8959)	1.477	0.000
Cross- section Chi -square	995	1513.137	0.000

Note: H_0: There are no fixed effects in all cases

ANNEXURE III

Table A III.1 Results of Hausman test for H1

Regression Equation: $MVA_{it} = \beta_0 + \beta_1 \; EVA_{it} + e_{it}$

Effects Test	Chi-sq. Statistics	Degree of Freedom	*p-value*
Cross-section Random	30.567150	1	0.0000

Table A III.2 Results of Hausman test for H2

Regression Equation: $MVA_{it} = \beta_0 + \beta_1 \; EVA_{it} + \beta_2 \; EPS_{it} + \beta_3 \; ROCE_{it} + \beta_4 \; RONW_{it} + \beta_5 \; OCF_{it} + \beta_6 \; NOPAT_{it} + \beta_7 \; NI_{it} + \beta_8 \; RI_{it} + e_{it}$

Effects Test	Chi-sq. Statistics	Degree of Freedom	*p-value*
Cross-section Random	157.123132	8	0.0000

Regression Equation: $MVA_{it} = \beta_0 + \beta_1 \; EVA_{it} + e_{it}$

Effects Test	Chi-sq. Statistics	Degree of Freedom	*p-value*
Cross-section Random	30.567150	1	0.0000

Regression Equation: $MVA_{it} = \beta_0 + \beta_1 \; EPS_{it} + e_{it}$

Effects Test	Chi-sq. Statistics	Degree of Freedom	*p-value*
Cross-section Random	14.753688	1	0.0001

Regression Equation: $MVA_{it} = \beta_0 + \beta_1 \; ROCE_{it} + e_{it}$

Effects Test	Chi-sq. Statistics	Degree of Freedom	*p-value*
Cross-section Random	0.175998	1	0.6748

Regression Equation: $MVA_{it} = \beta_0 + \beta_1 \; RONW_{it} + e_{it}$

Effects Test	Chi-sq. Statistics	Degree of Freedom	*p-value*
Cross-section Random	0.780069	1	0.3771

Regression Equation: $MVA_{it} = \beta_0 + \beta_1 \; OCF_{it} + e_{it}$

Effects Test	Chi-sq. Statistics	Degree of Freedom	*p-value*
Cross-section Random	111.817581	1	0.0000

Regression Equation: $MVA_{it} = \beta_0 + \beta_1 \; NOPAT_{it} + e_{it}$

Effects Test	Chi-sq. Statistics	Degree of Freedom	*p-value*
Cross-section Random	20.614441	1	0.0000

Regression Equation: $MVA_{it} = \beta_0 + \beta_1 \; NI_{it} + e_{it}$

Effects Test	Chi-sq. Statistics	Degree of Freedom	*p-value*
Cross-section Random	31.354216	1	0.0000

Regression Equation: $MVA_{it} = \beta_0 + \beta_1 \; RI_{it} + e_{it}$

Effects Test	Chi-sq. Statistics	Degree of Freedom	*p-value*
Cross-section Random	32.035702	1	0.0000

Regression Equation: $MVA_{it} = \beta_0 + \beta_1 \; EVA_{it} + \beta_2 \; RI_{it} + e_{it}$

Effects Test	Chi-sq. Statistics	Degree of Freedom	*p-value*
Cross-section Random	31.606932	2	0.0000

Table A III.2 Results of Hausman test for H2 (contd.)

Regression Equation: $MVA_{it} = \beta_0+\beta_1\ EVA_{it} + \beta_2\ NI_{it} + e_{it}$

Effects Test	Chi-sq. Statistics	Degree of Freedom	*p-value*
Cross-section Random	54.746699	2	0.0000

Regression Equation: $MVA_{it} = \beta_0+\beta_1\ EVA_{it} + \beta_2\ NOPAT_{it} + e_{it}$

Effects Test	Chi-sq. Statistics	Degree of Freedom	*p-value*
Cross-section Random	47.832550	2	0.0000

Regression Equation: $MVA_{it} = \beta_0+\beta_1\ EVA_{it} + \beta_2\ OCF_{it} + e_{it}$

Effects Test	Chi-sq. Statistics	Degree of Freedom	*p-value*
Cross-section Random	119.422551	2	0.0000

Regression Equation: $MVA_{it} = \beta_0+\beta_1\ EVA_{it} + \beta_2\ RONW_{it} + e_{it}$

Effects Test	Chi-sq. Statistics	Degree of Freedom	*p-value*
Cross-section Random	30.683070	2	0.0000

Regression Equation: $MVA_{it} = \beta_0+\beta_1\ EVA_{it} + \beta_2\ ROCE_{it} + e_{it}$

Effects Test	Chi-sq. Statistics	Degree of Freedom	*p-value*
Cross-section Random	30.814528	2	0.0000

Regression Equation: $MVA_{it} = \beta_0+\beta_1\ EVA_{it} + \beta_2\ EPS_{it} + e_{it}$

Effects Test	Chi-sq. Statistics	Degree of Freedom	*p-value*
Cross-section Random	47.620825	2	0.0000

Regression Equation: $MVA_{it} = \beta_0+\beta_1\ EPS_{it} + \beta_2\ RI_{it} + e_{it}$

Effects Test	Chi-sq. Statistics	Degree of Freedom	*p-value*
Cross-section Random	48.551531	2	0.0000

Regression Equation: $MVA_{it} = \beta_0+\beta_1\ EPS_{it} + \beta_2\ NI_{it} + e_{it}$

Effects Test	Chi-sq. Statistics	Degree of Freedom	*p-value*
Cross-section Random	41.043952	2	0.0000

Regression Equation: $mMVA_{it} = \beta_0+\beta_1\ EPS_{it} + \beta_2\ NOPAT_{it} + e_{it}$

Effects Test	Chi-sq. Statistics	Degree of Freedom	*p-value*
Cross-section Random	33.436912	2	0.0000

Regression Equation: $MVA_{it} = \beta_0+\beta_1\ EPS_{it} + \beta_2\ OCF_{it} + e_{it}$

Effects Test	Chi-sq. Statistics	Degree of Freedom	*p-value*
Cross-section Random	133.725940	2	0.0000

Regression Equation: $MVA_{it} = \beta_0+\beta_1\ EPS_{it} + \beta_2\ RONW_{it} + e_{it}$

Effects Test	Chi-sq. Statistics	Degree of Freedom	*p-value*
Cross-section Random	15.017436	2	0.0005

Regression Equation: $MVA_{it} = \beta_0+\beta_1\ EPS_{it} + \beta_2\ ROCE_{it} + e_{it}$

Effects Test	Chi-sq. Statistics	Degree of Freedom	*p-value*
Cross-section Random	14.812218	2	0.0006

Table A III.2 Results of Hausman test for H2 (contd.)

Regression Equation: $MVA_{it} = \beta_0+\beta_1 ROCE_{it} + \beta_2\ RI_{it} + e_{it}$

Effects Test	**Chi-sq. Statistics**	**Degree of Freedom**	***p-value***
Cross-section Random	31.291605	2	0.0000

Regression Equation: $MVA_{it} = \beta_0+\beta_1 ROCE_{it} + \beta_2\ NOPAT_{it} + e_{it}$

Effects Test	**Chi-sq. Statistics**	**Degree of Freedom**	***p-value***
Cross-section Random	21.237326	2	0.0000

Regression Equation: $MVA_{it} = \beta_0+\beta_1 ROCE_{it} + \beta_2\ OCF_{it} + e_{it}$

Effects Test	**Chi-sq. Statistics**	**Degree of Freedom**	***p-value***
Cross-section Random	112.449667	2	0.0000

Regression Equation: $MVA_{it} = \beta_0+\beta_1 ROCE_{it} + \beta_2\ RONW_{it} + e_{it}$

Effects Test	**Chi-sq. Statistics**	**Degree of Freedom**	***p-value***
Cross-section Random	0.937142	2	0.6259

Regression Equation: $MVA_{it} = \beta_0+\beta_1 RONW_{it} + \beta_2\ RI_{it} + e_{it}$

Effects Test	**Chi-sq. Statistics**	**Degree of Freedom**	***p-value***
Cross-section Random	0.937142	2	0.6259

Regression Equation: $MVA_{it} = \beta_0+\beta_1 RONW_{it} + \beta_2\ NI_{it} + e_{it}$

Effects Test	**Chi-sq. Statistics**	**Degree of Freedom**	***p-value***
Cross-section Random	32.163531	2	0.0000

Regression Equation: $MVA_{it} = \beta_0+\beta_1 RONW_{it} + \beta_2\ NOPAT_{it} + e_{it}$

Effects Test	**Chi-sq. Statistics**	**Degree of Freedom**	***p-value***
Cross-section Random	31.726773	2	0.0000

Regression Equation: $MVA_{it} = \beta_0+\beta_1 RONW_{it} + \beta_2\ OCF_{it} + e_{it}$

Effects Test	**Chi-sq. Statistics**	**Degree of Freedom**	***p-value***
Cross-section Random	21.340069	2	0.0000

Regression Equation: $MVA_{it} = \beta_0+\beta_1 OCF_{it} + \beta_2\ RI_{it} + e_{it}$

Effects Test	**Chi-sq. Statistics**	**Degree of Freedom**	***p-value***
Cross-section Random	111.845937	2	0.0000

Regression Equation: $MVA_{it} = \beta_0+\beta_1 OCF_{it} + \beta_2\ NI_{it} + e_{it}$

Effects Test	**Chi-sq. Statistics**	**Degree of Freedom**	***p-value***
Cross-section Random	118.580107	2	0.0000

Regression Equation: $MVA_{it} = \beta_0+\beta_1 OCF_{it} + \beta_2\ NOPAT_{it} + e_{it}$

Effects Test	**Chi-sq. Statistics**	**Degree of Freedom**	***p-value***
Cross-section Random	129.109670	2	0.0000

Regression Equation: $MVA_{it} = \beta_0+\beta_1 NOPAT_{it} + \beta_2\ RI_{it} + e_{it}$

Effects Test	**Chi-sq. Statistics**	**Degree of Freedom**	***p-value***
Cross-section Random	109.464378	2	0.0000

Regression Equation: $MVA_{it} = \beta_0+\beta_1 NOPAT_{it} + \beta_2\ NI_{it} + e_{it}$

Effects Test	**Chi-sq. Statistics**	**Degree of Freedom**	***p-value***
Cross-section Random	49.234185	2	0.0000

Table A III.2 Results of Hausman test for H2 (contd.)

Regression Equation: $MVA_{it} = \beta_0+\beta_1 NI_{it} + \beta_2 RI_{it} + e_{it}$

Effects Test	**Chi-sq. Statistics**	**Degree of Freedom**	***p-value***
Cross-section Random	138.878413	2	0.0000

Table A III.3 Results of Hausman test for H3

Regression Equation: $EVA_{it} = \beta_0+\beta_1\ OCF_{it} + e_{it}$

Effects Test	**Chi-sq. Statistics**	**Degree of Freedom**	***p-value***
Cross-section Random	8.227757	1	0.0041

Regression Equation: $EVA_{it} = \beta_0+\beta_1 ACC_{it} + e_{it}$

Effects Test	**Chi-sq. Statistics**	**Degree of Freedom**	***p-value***
Cross-section Random	9.457940	1	0.0021

Regression Equation: $EVA_{it} = \beta_0+\beta_1 ATI_{it} + e_{it}$

Effects Test	**Chi-sq. Statistics**	**Degree of Freedom**	***p-value***
Cross-section Random	4.637704	1	0.0313

Regression Equation: $EVA_{it} = \beta_0+\beta_1 CC_{it} + e_{it}$

Effects Test	**Chi-sq. Statistics**	**Degree of Freedom**	***p-value***
Cross-section Random	16.128335	1	0.0001

Regression Equation: $EVA_{it} = \beta_0+\beta_1 ADJ_{it} + e_{it}$

Effects Test	**Chi-sq. Statistics**	**Degree of Freedom**	***p-value***
Cross-section Random	19.969522	1	0.0000

Regression Equation: $EVA_{it} = \beta_0+\beta_1 OCF_{it} + \beta_2 ADJ_{it}\ e_{it}$

Effects Test	**Chi-sq. Statistics**	**Degree of Freedom**	***p-value***
Cross-section Random	21.875729	2	0.0000

Regression Equation: $EVAit = \beta_0+\beta_1 OCF_{it} + \beta_2 CC_{it}\ e_{it}$

Effects Test	**Chi-sq. Statistics**	**Degree of Freedom**	***p-value***
Cross-section Random	8.939399	2	0.0115

Regression Equation: $EVAit = \beta_0+\beta_1 OCF_{it} + \beta_2 ATI_{it+}\ e_{it}$

Effects Test	**Chi-sq. Statistics**	**Degree of Freedom**	***p-value***
Cross-section Random	12.296392	2	0.0021

Regression Equation: $EVA_{it} = \beta_0+\beta_1 OCF_{it} + \beta_2 ACC_t + e_{it}$

Effects Test	**Chi-sq. Statistics**	**Degree of Freedom**	***p-value***
Cross-section Random	8.155455	2	0.0169

Regression Equation: $EVA_{it} = \beta_0+\beta_1 ACC_{it} + \beta_2 ADJ_t\ e_{it}$

Effects Test	**Chi-sq. Statistics**	**Degree of Freedom**	***p-value***
Cross-section Random	22.416380	2	0.0000

Regression Equation: $EVA_{it} = \beta_0+\beta_1 ACC_{it} + \beta_2 CC_{it+}\ e_{it}$

Effects Test	**Chi-sq. Statistics**	**Degree of Freedom**	***p-value***
Cross-section Random	14.234359	2	0.0008

Table A III.3 Results of Hausman test for H3 (contd.)

Regression Equation: $EVA_{it} = \beta_0+\beta_1 ACC_{it} + \beta_2 ATI_{it+} e_{it}$

Effects Test	Chi-sq. Statistics	Degree of Freedom	*p-value*
Cross-section Random	14.002661	2	0.0009

Regression Equation: $EVA_{it} = \beta_0+\beta_1 ATI_{it} + \beta_2 ADJ_{it+} e_{it}$

Effects Test	Chi-sq. Statistics	Degree of Freedom	*p-value*
Cross-section Random	24.251116	2	0.0000

Regression Equation: $EVA_{it} = \beta_0+\beta_1 ATI_{it} + \beta_2 CC_{it+} e_{it}$

Effects Test	Chi-sq. Statistics	Degree of Freedom	*p-value*
Cross-section Random	27.869802	2	0.0000

Regression Equation: $EVA_{it} = \beta_0+\beta_1 CC_{it} + \beta_2 ADJ_{it+} e_{it}$

Effects Test	Chi-sq. Statistics	Degree of Freedom	*p-value*
Cross-section Random	16.351384	2	0.0003

Regression Equation: $EVA_{it} = \beta_0+\beta_1\ OCF_{it} + \ \beta_2\ ACC_{it} + \ \beta_3\ ATI_{it} + \ \beta_4\ CC_{it}+ \ \beta_5\ ADJ_{it} + e_{it}$

Effects Test	Chi-sq. Statistics	Degree of Freedom	*p-value*
Cross-section Random	1.624792	5	0.8982

Regression Equation: $MVA_{it} = \beta_0+\beta_1\ \ OCF_{it}\ + e_{it}$

Effects Test	Chi-sq. Statistics	Degree of Freedom	*p-value*
Cross-section Random	111.817581	1	0.0000

Regression Equation: $MVA_{it} = \beta_0+\beta_1 ACC_{it} + \ e_{it}$

Effects Test	Chi-sq. Statistics	Degree of Freedom	*p-value*
Cross-section Random	81.080177	1	0.0000

Regression Equation: $MVA_{it} = \beta_0+\beta_1 ATI_{it} + \ e_{it}$

Effects Test	Chi-sq. Statistics	Degree of Freedom	*p-value*
Cross-section Random	0.004149	1	0.9486

Regression Equation: $MVA_{it} = \beta_0+\beta_1 CC_{it} + \ e_{it}$

Effects Test	Chi-sq. Statistics	Degree of Freedom	*p-value*
Cross-section Random	32.397870	1	0.0000

Regression Equation: $MVA_{it} = \beta_0+\beta_1 ADJ_{it} + \ e_{it}$

Effects Test	Chi-sq. Statistics	Degree of Freedom	*p-value*
Cross-section Random	28.092194	1	0.0000

Regression Equation: $MVA_{it} = \beta_0+\beta_1 OCF_{it} + \beta_2 ADJ_{it+} e_{it}$

Effects Test	Chi-sq. Statistics	Degree of Freedom	*p-value*
Cross-section Random	125.799514	2	0.0000

Regression Equation: $MVA_{it} = \beta_0+\beta_1 OCF_{it} + \beta_2 CC_{it+} e_{it}$

Effects Test	Chi-sq. Statistics	Degree of Freedom	*p-value*
Cross-section Random	118.560400	2	0.0000

Regression Equation: $MVAit = \beta_0+\beta_1 OCF_{it} + \beta_2 ATI_{it+} e_{it}$

Effects Test	Chi-sq. Statistics	Degree of Freedom	*p-value*
Cross-section Random	111.305315	2	0.0000

Table A III.3 Results of Hausman test for H3 (contd.)

Regression Equation: $MVA_{it} = \beta_0+\beta_1 OCF_{it} + \beta_2 ACC_{it} + e_{it}$

Effects Test	**Chi-sq. Statistics**	**Degree of Freedom**	***p-value***
Cross-section Random	109.464378	2	0.0000

Regression Equation: $MVA_{it} = \beta_0+\beta_1 ACC_{it} + \beta_2 ADJ_{it+} e_{it}$

Effects Test	**Chi-sq. Statistics**	**Degree of Freedom**	***p-value***
Cross-section Random	89.860158	2	0.0000

Regression Equation: $MVA_{it} = \beta_0+\beta_1 ACC_{it} + \beta_2 CC_{it+} e_{it}$

Effects Test	**Chi-sq. Statistics**	**Degree of Freedom**	***p-value***
Cross-section Random	94.360230	2	0.0000

Regression Equation: $MVA_{it} = \beta_0+\beta_1 ACC_{it} + \beta_2 ATI_{it+} e_{it}$

Effects Test	**Chi-sq. Statistics**	**Degree of Freedom**	***p-value***
Cross-section Random	78.731889	2	0.0000

Regression Equation: $MVA_{it} = \beta_0+\beta_1 ATI_{it} + \beta_2 ADJ_{it+} e_{it}$

Effects Test	**Chi-sq. Statistics**	**Degree of Freedom**	***p-value***
Cross-section Random	26.389179	2	0.0000

Regression Equation: $MVA_{it} = \beta_0+\beta_1 ATI_{it} + \beta_2 CC_{it+} e_{it}$

Effects Test	**Chi-sq. Statistics**	**Degree of Freedom**	***p-value***
Cross-section Random	32.130600	2	0.0000

Regression Equation: $MVA_{it} = \beta_0+\beta_1 CC_{it} + \beta_2 ADJ_{it+} e_{it}$

Effects Test	**Chi-sq. Statistics**	**Degree of Freedom**	***p-value***
Cross-section Random	44.934572	2	0.0000

Regression Equation: $MVA_{it} = \beta_0+\beta_1 OCF_{it} + \beta_2 ACC_{it} + \beta_3 ATI_{it} + \beta_4 CC_{it}+ \beta_5 ADJ_{it} + e_{it}$

Effects Test	**Chi-sq. Statistics**	**Degree of Freedom**	***p-value***
Cross-section Random	103.259648	5	0.0000

Note: Ho: Individual effects are uncorrelated with the other regressors in all cases

Table A IV ANOVA results for industry wise univariate regression

Industry \ Variable	EVA		NOPAT		ROCE		RONW		RI		EPS		OCF		NI	
	F-Stat	*Sig.*	*F-Stat*	*Sig.*	*F-Stat*	*Sig.*	*F-Stat*	*Sig.*	*F-Stat*	*Sig.*	*F-Stat*	*Sig.*	*F-Stat*	*Sig.*	*F-Stat*	*Sig.*
Agriculture Products	17.26	0.000	480.95	0.000	51.88	0.000	21.34	0.000	19.24	0.000	37.76	0.000	139.57	0.000	482.14	0.000
Automobile	45.59	0.000	1550.01	0.000	8.11	0.005	0.28*	0.595	49.60	0.000	20.49	0.000	330.29	0.000	1703.66	0.000
Business Consultancy	0.26*	0.611	18.64	0.000	20.56	0.000	9.92	0.002	0.25*	0.619	240.72	0.000	11.06	0.001	46.47	0.000
Cement	3.83	0.052	492.01	0.000	5.49	0.020	0.46*	0.499	4.05	0.045	2.69	0.082	458.74	0.000	609.35	0.000
Chemical	0.00*	0.980	32.17	0.000	3.47	0.063	0.46*	0.497	0.00*	0.947	0.32*	0.573	8.65	0.003	70.09	0.000
Computer & IT	2419.57	0.000	2493.57	0.000	27.03	0.000	4.88	0.028	2355.2	0.000	150.35	0.000	1128.73	0.000	2371.83	0.000
Construction	106.08	0.000	943.51	0.000	0.01*	0.903	0.26*	0.613	85.73	0.000	1.69*	0.194	5.34	0.021	968.39	0.000
Diversified	11.99	0.001	16.30	0.000	12.01	0.001	5.63	0.020	11.60	0.001	0.21*	0.646	7.37	0.008	9.26	0.003
Power generation	0.57*	0.453	15.30	0.000	25.36	0.000	3.62	0.058	0.63*	0.427	3.62*	0.058	0.33*	0.566	26.60	0.000
Electronics	126.18	0.000	917.35	0.000	0.50*	0.482	0.12*	0.727	127.87	0.000	118.28	0.000	258.14	0.000	636.80	0.000
FMCG	56.15	0.000	811.38	0.000	41.84	0.000	40.06	0.000	56.28	0.000	0.00*	0.984	767.36	0.000	885.73	0.000
Footwear	15.31	0.000	38.03	0.000	0.74*	0.394	0.30*	0.582	14.66	0.000	0.00*	0.961	17.58	0.000	32.00	0.000
Gems & Jewelry	1.25*	0.265	38.78	0.000	0.02*	0.895	1.25*	0.265	1.64*	0.202	15.51	0.000	2.62*	0.108	32.05	0.000
Hotels and Restaurant	77.27	0.000	137.43	0.000	4.96	0.027	0.35*	0.557	78.15	0.000	5.09	0.025	112.97	0.000	165.42	0.000
Machinery	184.09	0.000	479.30	0.000	2.63*	0.105	4.54	0.034	177.29	0.000	30.57	0.000	0.02*	0.889	374.72	0.000
Metal and Metal products	257.14	0.000	2615.11	0.000	39.75	0.000	6.52	0.000	253.94	0.000	36.03	0.000	1528.20	0.000	2270.03	0.000
Miscellaneous	793.35	0.000	2170.56	0.000	0.39*	0.533	3.85	0.050	809.15	0.000	316.58	0.000	1596.62	0.000	2796.51	0.000
Paper	235.84	0.000	57.39	0.000	0.06*	0.811	0.02*	0.901	227.30	0.000	1.21*	0.272	3.17*	0.076	113.15	0.000
Pharmaceutical	712.89	0.000	1036.06	0.000	20.87	0.000	1.18*	0.278	11.145	0.000	64.89	0.000	434.14	0.000	1100.34	0.000
Plastic	0.62*	0.431	1.73*	0.189	0.06*	0.810	0.31*	0.577	0.47*	0.495	1.32*	0.250	58.04	0.000	12.99	0.000
Textile	62.48	0.000	524.64	0.000	0.10*	0.755	0.58*	0.448	62.30	0.000	235.26	0.000	363.42	0.000	809.19	0.000
Trading	62.02	0.000	397.17	0.000	2.14*	0.144	2.55*	0.111	64.85	0.000	9.74	0.002	154.32	0.000	252.71	0.000
Transport Services	49.79	0.000	57.41	0.000	3.83	0.053	0.65*	0.422	51.54	0.000	3.07*	0.082	59.91	0.000	39.66	0.000

* Results are statistically not significant at $p \leq 0.05$