Value Creation Measurements: An Industry-Based Study

Prof. John H. Hall

Department of Financial Management

University of Pretoria

Pretoria

Republic of South Africa

Tel: +27 12 420 3389

e-mail: john.hall@up.ac.za

Abstract

Purpose

The purpose of this paper is to identify the shareholder value creation measure best suited to express shareholder value creation for a particular industry.

Design/methodology/approach

The analysis was performed on 192 companies listed on the Johannesburg Stock Exchange, classified into nine different samples or industries. Five shareholder value creation measures were examined, namely market value added, a market adjusted stock return, the market to book ratio, Tobin's Q ratio and the return on capital employed ÷ cost of equity.

Findings

An analysis of the nine categories of firms identified different measures best suited for expressing value creation. Stock returns did not provide appropriate value measurement. Instead, depending on the specific industry, Tobin's Q ratio, market value added and the market-to-book ratio should be used as measurements to measure and express value creation.

Practical implications

For management, the value drivers identified for each industry present a clear indication of industry specific variables upon which they can concentrate in their operating activities to most efficiently increase shareholder value.

Originality/value

Unlike previous studies that used only one or two different shareholder creation measures as dependent variables, this study uses five different value creation measures. Another contribution of the present study is the compilation of a unique set of value drivers that explain shareholder value creation best for each of the nine different categories of firms.

Keywords

Shareholder value; industry analysis; economic value added; market value added

1. Introduction

The ever increasing search for excellence, efficiency and performance enhancement of businesses by their management seems to be fueled and supported by the creation of new performance measurements, accounting systems, reporting requirements and business standards by academics, consulting firms and stock broking research houses. Consulting firms make sweeping statements regarding the effectiveness of their products; academics continuously and unabatedly conduct research on products and measurements created by themselves (and consulting firms) and even government and government agencies contribute in their own way towards the growing complexity of measuring business performance.

One of the most pertinent questions faced by all stakeholders of organizations is that of performance measurement, more specifically, shareholder value creation (or destruction) measurement. With the increasing number of measurements to management's disposal, the following question then arises: Is there a single specific measure of shareholder value that can be used as an indicator of value creation for any firm in any industry? Intuitively, one might argue that different shareholder value creation measures would perform best in different industries – it seems logical that, just as one shoe does not fit all, different industries need to be valued and measured according to different yardsticks.

Visaltanachoti, Luo and Yi (2008) cites research by Bowman and Helfat indicating that there are three variables that determine a particular firm's performance; industry, corporate and firm factors. Schmalensee (1985) found that 75% varance of industry rates of return can be explained by industry factors. Wernerfeldt and Montgomory (1988) used a different performance measurement (Tobins' Q) than Schmalensee and found similar results.

In this article, it is contended that, in order to manage the firm most optimally for shareholders, the most appropriate shareholder value creation measure should be used as yardstick and compass. Therefore, the research question is the following: Which shareholder value creation measure is best suited to a particular type of firm?

The most obvious measure of business performance and shareholder value creation is share price (Jensen and Murphy, 1990; Milbourn, 2003). Stewart (1991; 1994) argues that Economic Value Added (EVA) is the best method to express shareholder value creation, and in addition that it is an ideal yardstick to determine the level of compensation for a firm's management. However, shareholder value creation measures have evolved considerably in the last 25 years. Numerous studies in the last two decades have provided results that proved or disproved, promoted or criticized various shareholder value creation measurements. Traditional accounting-based measures to quantify shareholder creation, such as earnings per share (EPS), return on equity (ROE), return on assets (ROA) and dividend per share (DPS), to name but a few, have recently been challenged and supplemented by economic-based measures of shareholder creation, such as EVA, market value added (MVA), cash flow return on investment (CFROI), cash value added (CVA) and refined economic value added (REVA). Numerous studies had been undertaken to identify the measure that best expresses shareholder value creation. Sharma and Kumar (2010) list the results of 112 studies on EVA, and Hall (2013; 2016) discusses the results of 18 studies published between 1991 and 2011 on shareholder value creation measures. The results of these studies vary and seem to be a function of the shareholder creation measure used, the sample under scrutiny, the country of origin of the data and the statistical technique.

The vast majority of studies so far try to explain shareholder value creation, share price or excess market returns in respect of a homogenous sample of companies. However, the present study expands on this line of research by analyzing nine different samples or categories of firms. In addition, unlike previous studies that used only one or two different shareholder creation measures as dependent variables, this study uses five different value creation measures, namely MVA, a market adjusted stock return (MAR), the market to book ratio (MTB), Tobin's Q ratio (Qratio) and the return on capital employed ÷ cost of equity (ROEKE) as dependent variables. Another contribution of the present study is to compile a unique set of significant independent variables that explain shareholder value creation best for each of the nine different categories of firms.

The main objective of this study is to determine which specific shareholder value creation measure is best suited to express shareholder value creation for a particular industry. The study further attempts to establish whether accounting-based or economic-based internal value drivers are dominant in explaining shareholder value creation in that particular industry, and whether this is still the case if the external shareholder value creation measurement, as the dependent variable, changes. The last objective of this study is to establish, for each of nine different categories of firms examined, a set of variables that are unique and significant in determining shareholder value for that particular category of firms. Therefore, the following hypotheses were formulated:

H_1 Each industry has a specific shareholder value creation measure that explains shareholder value creation best for that particular industry.

H_2 Irrespective of a specific shareholder value creation measure, overall, the impact of economic-based value indicators on shareholder value creation is higher than that of accounting-based indicators.

H_3 The internal value indicators (drivers) that are significant in explaining shareholder value creation depend on the specific shareholder value creation measure used.

H_4 Each industry has a unique set of variables determining shareholder value.

The value of the present study is its determination of a unique shareholder value creation measure for particular industries. In addition, a specific set of variables per industry that create shareholder value, is identified. As far as can be ascertained, this has been attempted only in a limited number of studies (for example, Lee and Kim, 2009; Hall 2013; Hall 2016). The contribution of an analysis of this nature is firstly that it will empower management by providing them with the most correct and fair yardstick to express shareholder value creation or destruction for the particular type of firm or industry. Secondly, management in each industry classification will know where to direct their efforts in maximizing shareholder value, to the benefit of both their shareholders and themselves. Thirdly, management and shareholders alike will recognize that each industry has its own shareholder value creation measure, with a specific set of value drivers. Fourthly, being equipped with a tailor-made shareholder value creation measurement for a particular industry can help in the evolvement of a managerial compensation yardstick tied to increases in shareholder value. Lastly, portfolio managers will be made aware of the fact that there are specific differences in variables that create shareholder value for the different industries in which they plan to invest, and for which they want to perform share valuations, apply valuation methods or make investment recommendations to their clients.

The remainder of this article is organized as follows: a brief overview is given of the relevant literature, followed by a discussion of the research method, an analysis and discussion of the empirical results and a conclusion to the study, where specific recommendations are made.

2. Literature review

Shareholder value creation measurement is and will probably remain one of the most researched topics in corporate finance. There are various reasons for this, maybe the most obvious the fact that one of the most predominant features of shareholder value creation measurement is the sheer number of measurements that has been used, evolved or created over the past decades. Apart from the traditional accounting-based measurements such as ROE, ROA or EPS, economic-based shareholder value creation measurements has been developed by management consulting firms. Myers (1997) listed measures such as Stern Steward's EVA (Economic Value Added), Holt's CFROI (Cash Flow Return on Investment), Boston Consulting Group's TBR (Total Business Return), McKinsey's Economic Profit and LEK/ALcar's SVA (Shareholder Value Added) as economic-based measures of shareholder value creation.

Parallel to this development of shareholder creation measures, research has been conducted in order to determine the shareholder value creation measurement that best explain value creation or destruction. Studies have been conducted on data from various countries to determine which internal performance measure (whether accounting-based or economic-based) correlates best with shareholder value creation measures (such as stock returns, market-adjusted stock returns or MVA). Table 1 summarizes the salient features of a selection of 24 such studies covering the period from 1991 to 2016.

Table 1: Results of studies on shareholder value performance measures, 1991-2016

Authors	**Internal independent variable(s)**	**External dependent variable(s)**	**Result**	**Country; statistical technique**
Stewart (1991)	EVA, EPS, ROE and others	MVA	EVA	US; LS regression
Stern (1993)	EVA, ROE, cash flow growth, EPS growth, asset growth	MVA	EVA	US; LS regression
Milunovich and Tsuei (1996)	EVA, EVA growth, ROE, FCF	MVA	EVA	US; LS regression
O'Byrne (1996)	EVA, NOPAT, FCF	Market value÷ IC	EVA	US
Bacidore *et al.* (1997)	REVA, EVA	Stock returns	REVA	US; LS regression
Biddle *et al.* (1997)	EVA, EBEI, RI, OCF	Market-adjusted stock returns	EBEI	US; LS regression
Chen and Dodd (1997)	EVA, change in EVA, ROC, SPREAD, capital GROWTH, EPS, ROA, ROE	Stock return	ROA, EVA	US; Regression
Bao and Bao (1998)	NI, EVA, Value added	Equity value; share price	Value added (accounting)	US; LS regression

Authors	Internal independent variable(s)	External dependent variable(s)	Result	Country; statistical technique
De Villiers and Auret (1998)	EPS, EVA per share	Share price	EPS	South Africa; Regression
Hall (1999)	EVA, discounted EVA, ROA, ROE, ROCE, EPS, DPS, and others	MVA	EVA (same result as discounted EVA)	South Africa; LS regression
Worthington and West (2004)	EVA, RI, NCF, EBEI	Stock returns	EVA	Australia; Regression
De Wet (2005)	EVA, CFO ÷ IC, ROA	MVA	CFO ÷ IC	South Africa; LS regression
Ismail (2006)	EVA, RI, NI, NOPAT, OCF	Stock returns	NI, NOPAT	UK; Panel data regression
Kyriazis and Anastassis (2007)	EVA, NI, OI	Stock returns; MVA	NI, OI	Greece; Regression
Erasmus (2008)	CVA, EVA, RI, EBEI, CFO	Market adjusted returns	RI	South Africa; LS regression
Chmelikova (2008)	EVA, ROA, ROE	Market value of equity ÷ equity	EVA	Czech republic; Regression
Lee and Kim (2009)	EVA, REVA, MVA, CFO, ROA, ROE	Market adjusted returns	REVA, MVA	US; Pooled regression
Maditinos *et al.* (2009)	EVA, EPS, ROI, ROE, SVA	Stock returns	EVA with EPS	Greece; Pooled regression
Kumar and Sharma (2011)	EVA, NOPAT, OCF, ROE, ROCE	MVA	NOPAT, OCF	India; LS regression
Abdoli *et al.* (2012)	EVA, RI	Created shareholders value	RI	Iran; Regression
Arabsalehi and Mahmoodi (2012)	EVA, REVA, MVA, SVA, EPS, ROE, ROA, Cash from operations, return on sales	Stock returns	ROA, ROE	Iran, Panel regression
Aloy Niresh and Alfred (2014)	EVA	MVA	No significant relation	Sri Lanka; Regression
Gupta and Sikarwar (2016)	EPS, ROA, ROE, EVA	Stock returns	EVA	India; Regression

Abbreviations: LS (least squares), FCF (free cash flow), EBEI (earnings before extraordinary items), spread (ROCE minus weighted average cost of capital, WACC), NI (net income attributable to ordinary shareholders), value added (an accounting profit measure), DPS (dividend per share), IC (invested capital).

Source: Own observation and compilation.

It falls beyond the scope of this study to discuss the results of the abovementioned studies in more detail, but it is important to note that the inconsistency between their results may lead managers, investors, shareholders and researchers to ask the following questions: Why are there so many inconsistencies between the findings of these studies? Given these inconsistent results, which corporate performance measure is actually the best yardstick for management to use and apply in their business decisions? More importantly, what can be done to determine with greater certainty a more reliable shareholder value creation measure to communicate with shareholders or the investment fraternity? Do these inconsistencies in the results of the various studies imply that there is no single corporate performance measure that can be universally applied?

The present study aims to address these questions by refining and adding to past studies and data. This is achieved, firstly, by increasing the number of dependent and independent variables used (compared to those used in previous studies) in order to obtain a more concise and specific answer as to which single shareholder value creation measurement is best for a particular industry. Furthermore, by classifying a sample of companies in different categories or industries (as opposed to keeping them in one homogenous group), it may be possible to deduce which set of value drivers feature as significant variables explaining shareholder value creation in a particular industry.

McGahan and Proter (1997) found that industry effects accounts for a smaller profit variance in the manufacturing sector but larger variance in the entertainment sector, retail sector and transportation sector. More recently, Baca *et al.* (2000) illustrate that industry sector effects have surpassed country effects in explaining variations in stock market returns of seven developed countries. Hence, if one can find a corporate performance measure that best explains shareholder value creation for a particular industry, that performance measurement should be used as tool for management to manage and improve shareholder value creation, and for shareholders even as a possible performance yardstick for compensating the management of that industry.

In analyzing the results of the studies listed in Table 1 above, as well as the results of a study by Hall (2013), a number of dependent and independent variables were identified for use in the present study. All the dependent and independent variables used in the present study have been used in some way in the prior studies. The dependent variables for the present study are a market-adjusted 12-month stock return adjusted for the financial year-end of the specific firm (MAR), MVA (market value minus economic capital employed), the market to book ratio (MTB, the ratio of market value of equity at year-end to the book value of equity), Tobin's Q ratio (Qratio, the market value of equity plus the book value of interest-bearing debt to the replacement cost of fixed assets) and lastly, the return on capital employed ÷ cost of equity (ROEKE). The independent variables regressed against the dependent variables in the present study are EVA (return on economic capital minus the weighted average cost of capital [WACC], multiplied by capital); EVA growth (GEVA) (the growth in EVA over two consecutive years); REVA (EVA based on the market value of economic capital instead of the book value of capital); EBEI (earnings before extraordinary items and tax); NOPAT (net operating profit after tax); NI (the net income attributable to shareholders); ROA (return on average inflation adjusted assets); EPS (headline earnings per share); ROE (return on average inflation-adjusted equity); ROCE (return on economic capital employed) and the Spread (the difference between the ROCE and the WACC). The independent variables thus consist of five economic-based measurements, namely EVA, GEVA, REVA, ROCE and the Spread. The remaining six independent variables are accounting-based measures.

The objective of the current research is to demonstrate that different industries or categories of firms do have different performance measures that best explain or express shareholder value creation. It was envisaged that by establishing a unique performance measurement for a particular type of firm, a contribution to the existing body of knowledge can be made, enabling the use of this specific performance measure for management, shareholders and potential investors in the firm to get a more clear directive as to optimize their specific decisions in this regard.

The research questions and objectives are addressed using the methodology described in the next section.

3. Research methodology

The research method followed in this study is set out below. The industries selected for the analysis, the dependent and independent variables, and the statistical techniques applied, are discussed. The data used for this study were obtained from INET BFA, a South African supplier of quality financial data.

Firms listed on the Johannesburg Stock Exchange (JSE) from 2001 to 2011 were used. Sectors that were excluded from the population, due to the difficulty in calculating various dependent or independent variables for these firms, were banks, basic resources (mining companies), financial services, insurance, investment and real estate. The total number of firms included amounted to 192. The sector classification and the number of firms within a particular industry formed the selection criteria for the various categories of firms that were analyzed in this study. In addition, all firms with a positive EVA were identified to form another sample, as it was expected that there could be a difference between the value indicators of firms that create shareholder value in contrast to those of firms that destroy shareholder value. As the value drivers of capital intensive firms might differ from those of labor-intensive firms, two more samples were created, based on the capital or labor-intensity of the firms, in line with a study by Hall (2013). Descriptions of the samples are given in the table below.

Table 2. Sample Descriptions

Sample	Description	Firms
S1	All firms	192
S2	Firms with positive EVA values	121
S3	Capital-intensive firms	47
S4	Labor-intensive firms	49
S5	Sector: Construction and materials	28
S6	Sector: Food and beverages	19
S7	Sector: Industrial goods (manufacturing)	61
S8	Sector: Retail	23
S9	Sector: Technology	22

The five dependent variables used as shareholder value creation measures are the *MAR, MTB, MVA, Qratio* and *ROEKE*. The 11 independent variables, identified by an '(a)' for accounting-based and an '(e)' for economic-based measures, used in this study are EVA(e), GEVA(e), REVA(e), EBEI(a), NOPAT(a), NI(a), ROA(a), EPS(a), ROE(a), ROCE(e) and the Spread(e). These variables were calculated for all firms over the 11-year period under review. Outliers that fell outside three standard deviations from the mean were discarded. It might seem that 11 different independent variables can result in over-specification of the models; however, these 11 variables were chosen based on the results of the 18 prior studies on shareholder value creation measures analyzed in the study by Hall (2013), therefore all 11 remained in the analysis.

By applying panel data analysis, observations can be conducted on multiple phenomena over various periods for the same sample (Baltagi, 2008). This results in more reliable regression techniques for the cross-sectional time series data, and greatly enhances the validity of regression results. For the current study, the data set was an unbalanced panel.

A number of statistical tests were performed on the data, namely tests for serial correlation, heteroskedasticity and stationarity. These tests were also used to confirm that the structure of the data conformed to the assumptions of the fixed effects model. The Likelihood Ratio test was used to determine the validity of the fixed effects model. A fixed effects model estimation was conducted in two rounds: the first round identified data problems, and the second round corrected the identified data problems, in particular, problems with serial correlation. Prais-Winsten adjustments for the correction of serial correlation and an autoregressive term in the models were used.

The multiple regression model used is the following:

$$MAR_{its} = \beta_0 + \beta_1 EVA_{its} + \beta_2 GEVA_{its} + \beta_3 REVA_{its} + \beta_4 EBEI_{its} + \beta_5 NOPAT_{its} + \beta_6 NI_{its} + \beta_7 ROA_{its} + \beta_8 EPS_{its} + \beta_9 ROE_{its} + \beta_{10} ROCE_{its} + \beta_{11} \text{Spread}_{its} + \varepsilon_{its}. \quad (1)$$

In Equation 1 above, MAR_{its} is the market adjusted return for Firm *i* in Period *t* for Industry *s, EVA_{its}* is the amount of economic value added for Firm *i* in Period *t* for Industry *s*, and so on. ε_{its} is a stochastic error term for Firm *i* at Time *t* for Industry *s*; *i* = 1 to 192; *t* = 1 (2001) to 11 (2011), and *s* = 1 to 9 for the nine different categories of firms.

$$MTB_{its} = \beta_0 + \beta_1 EVA_{its} + \beta_2 GEVA_{its} + \beta_3 REVA_{its} + \beta_4 EBEI_{its} + \beta_5 NOPAT_{its} + \beta_6 NI_{its} + \beta_7 ROA_{its} + \beta_8 EPS_{its} + \beta_9 ROE_{its} + \beta_{10} ROCE_{its} + \beta_{11} \text{Spread}_{its} + \varepsilon_{its.} \quad (2)$$

In Equation 2 above, MTB_{its} is the market-to-book ratio for Firm *i* in Period *t* for Industry *s*, EVA_{its} is the amount of EVA for Firm *i* in Period *t* for Industry *s*, and so on.

In the final analysis on the data of this study, a backward stepwise multiple regression analysis was performed in order to eliminate possible over-specification of the models and therefore to determine the significant independent variables for each industry. The model used was specified as follows:

$$MVA_{it1} = \beta_0 + \beta_1 EVA_{it1} + \beta_2 GEVA_{it1} + \beta_3 REVA_{it1} + \beta_4 EBEI_{it1} + \beta_5 NOPAT_{it1} + \beta_6 NI_{it1} + \beta_7 ROA_{it1} + \beta_8 EPS_{it1} + \beta_9 ROE_{it1} + \beta_{10} ROCE_{it1} + \beta_{11} Spread_{it1} + \varepsilon_{it1} \quad (3a)$$

…

$$MVA_{it1} = \beta_0 + \beta_1 EVA_{it1} + \beta_5 NOPAT_{it1} + \beta_7 ROA_{it1} + \beta_8 EPS_{it1} + \varepsilon_{it1} \qquad (3b)$$

Once the analysis described above had been performed, a preferred dependent variable for each of the nine samples could be obtained. The preferred dependent variable was selected based on the significance of the overall dependent variable for that sample, determined by the F-test, the adjusted R^2 value and the presence of serial correlation. By identifying the dependent variable that best fits a sample, the main objective of the study could be achieved, namely to determine the shareholder value creation measurement that best explains the value creation for a particular industry or category of firm. Further analysis of the results addressed the other hypotheses based on the literature review as set out above; more particularly, it was possible to compile a set of significant variables that determine shareholder value for each of the nine categories of firms.

In the next section, the results from the empirical analysis are presented and discussed.

4. Results and discussion

The empirical results of this study are discussed by first commenting on the descriptive statistics, followed by the empirical results (the latter are based on a number of rounds of statistical calculations). Findings, analysis and interpretations of the results are considered throughout.

4.1 Descriptive statistics

The descriptive statistics of the mean values of all the variables for all categories of firms are presented in Table 3 below.

Table 3. Mean Values for All Categories of Firms

Variable	All firms	Positive EVAs	Capital intensive	Labor intensive	Construction and Materials	Food and Beverages	Industrial goods (manufacturing)	Retail	Technology
MAR (%)	1.34	3.64	2.61	-3.19	-1.54	1.21	0.45	-0.63	10.98
MTB	5.07	4.07	2.99	10.75	4.08	1.81	1.65	9.92	2.28
MVA	3.90	2.99	1.86	10.23	2.58	1.60	1.58	6.30	1.56
Qratio	4.55	3.33	2.32	10.72	3.44	1.92	1.47	8.22	2.25
ROEKE	2.10	2.59	1.95	2.54	2.51	1.58	1.85	3.30	1.83
EVA (Rm)	234.49	554.31	135.42	864.70	44.45	75.90	-141.44	214.10	-19.32
GEVA (%)	-2.44	-1.04	-0.93	-1.81	-2.72	-13.27	-0.57	-0.57	-0.34
REVA (Rm)	-2,957.72	-2,890.51	-198.22	-7,000.74	-48.80	-5,709.80	-85.85	-128.47	-145.90
EPS (cent)	535.59	234.36	149.68	175.00	147.73	270.63	1,368.96	198.19	26.32
EBEI (Rm)	1,417.50	1,696.71	1,032.19	2,030.95	289.98	1,707.41	1,016.62	604.52	74.32
NOPAT (Rm)	567.63	838.83	622.53	657.34	171.04	733.79	157.09	407.88	45.16
ROA (%)	15.41	21.80	14.25	20.15	13.66	10.79	17.63	16.74	14.96
NI (Rm)	833.59	963.78	545.53	1,135.18	170.73	924.73	719.69	374.84	47.14
ROE (%)	76.01	135.02	85.12	195.32	13.29	13.59	173.41	12.92	51.30
ROCE (%)	9.74	23.52	12.87	-17.40	16.13	16.99	11.01	14.71	22.66
Spread (%)	3.30	11.12	2.76	1.34	4.32	-0.46	-1.30	14.68	7.26

The descriptive statistics in Table 3 clearly reveal the differences between the values of the variables relating to the various categories of firms. The *MAR* varies from 11% in the Technology sector to 1.2% in the Food and Beverages sector to -1.54% in the Construction and Materials sector. Although all nine categories of firms have a positive *MTB*, *MVA* and *Qratio*, there are also large differences between the values of these variables. All nine categories of firms report a positive *ROA,* with the lowest value of 11% for the Food and Beverages sector, and the highest value of 22% for firms with a positive EVA. These descriptive statistics also highlight the consistent positive figures for the Technology sector, the Food and Beverages sector, and firms with a positive EVA. The differences in the values of both the independent and dependent variables between the various categories of firms, as well as differences between the categories of firms, suggested that the empirical results of the statistical analysis would also reflect these differences, with corresponding implications in this regard.

4.2 Empirical results

The Likelihood Ratio test was applied to determine the validity of the fixed effects model. This was done for the five dependent variables; *MAR, MTB, MVA, Qratio* and *ROEKE*. The Likelihood Ratio results for *MAR* indicated that a fixed effects specification was appropriate for all except two of the samples, namely Samples 4 and 7, for which the fixed effects models were not estimated. The results for *MTB* indicated that for all samples except Sample 8, fixed effects models were an appropriate estimation technique. The results for the dependent variables *MVA, Qratio* and *ROEKE* indicated that the fixed effect models can be estimated for all samples.

4.3 Preferred shareholder value creation measurements

In order to determine a preferred shareholder value creation measurement for each category of firms, the final fixed effects estimation was done in two rounds. **In the first round**, the models of shareholder value creation were estimated in order to identify any data problems. The first round fixed effects estimation results for *MAR* indicated joint significance for each of the models to be significant at least at a 5% level of significance. The adjusted R^2 values were generally very low, ranging between 2% and 30%. The initial indication was therefore that *MAR*-based fixed effects models did not perform well. The estimation results for *MTB* indicated that the joint significance for each estimation was significant. In other words, it was found that, collectively, the independent variables are significant in explaining variations in the dependent variable *MTB*. Given the results for both *MAR* and *MTB*, one could deduce that models with *MTB* as the shareholder value creation measurement performed better in explaining shareholder value creation. In the first round fixed effects estimation for *MVA,* the majority of the adjusted R^2 values were well above 50%, indicating high explanatory power for those samples. The estimation for Sample 5, however, revealed that the model had very little explanatory power. All the models except one exhibited positive serial correlation – Sample 8 had no serial correlation. All samples, barring Sample 8, were therefore re-estimated in the second round of estimation. From the above, it can be seen that *MTB* and *MVA* produced very similar results. The first round of estimation's results also suggested that the *Qratio* may perform better as a shareholder value creation measure than *MAR*, *MTB* and *MVA*. The results for the final dependent variable, *ROEKE,* indicated adjusted R^2 values from 29.1% to 92.7%, with the majority of the models recording adjusted R^2 values far above 50%.

A **second round** of model estimation was then conducted where, in particular, serial correlation was accounted for. The second round estimation for *MAR* showed some improvement in the explanatory power of the estimations. These values were, however, still very low. A number of models showed marked improvements in the serial correlation. Nevertheless, the low explanatory power of these models suggested that *MAR* is not an appropriate shareholder value creation measure for analysis in this study. For *MTB*, Samples 2 and 9 had very low overall explanatory power. This, together with persistent serial correlation, suggests that trends in the variables for firms with positive EVA values, or firms which fall in the Technology sector, do not sufficiently explain the trend in *MTB* and are therefore not appropriate for a model of the shareholder value creation measure *MTB*. A marked improvement was seen in the explanatory power of the *MVA*-based models after the second round of estimation. The models now displayed adjusted R^2 values above 60%, with most values well above that. The re-estimation of the *Qratio*-based models displayed an overall improvement in the explanatory power – as indicated by the adjusted R^2 values – but suffered from persistent serial correlation. For many of the models, the Durbin-Watson (DW) statistic barely fell outside the region of no serial correlation and had generally high explanatory power. All samples except Samples 3, 7 and 9 were deemed to significantly explain variations in the Q*ratio*. The results for the shareholder value creation measure *ROEKE* displayed the greatest improvement in terms of serial correlation, with four of the nine models no longer exhibiting serial correlation. Models based on all samples except Samples 1 and 2 performed well, although serial correlation was still present.

With most of the remaining DW statistics falling just outside the region of no serial correlation, a lenient view was adopted, and Samples 3 through to 9 were considered good representations of the variation in the shareholder value creation measure *ROEKE*.

The results of the above analyses enabled a preferred shareholder value creation measurement to be identified for each sample, based on the significance of the overall model for that sample, determined by the F-test, the adjusted R^2 value and presence of serial correlation. It should be noted that serial correlation persists in the sample containing all firms and the industrial goods industry. In these cases, the model with the smallest deviation from the no serial correlation range was selected.

Table 4. Preferred Shareholder Value Creation Measurement for Each Sample

Sample	Shareholder value creation measurement	Adj. R^2	F-value	p-value	Durbin-Watson			
					LDW	DW	UDW	SC
All firms	*MTB*	0.658	19.212	0.000	1.9003	2.125	2.0682	Negative SC
Positive EVAs	*Qratio*	0.496	9.998	0.000	1.8734	1.943	2.0791	No SC
Capital-intensive	*ROEKE*	0.629	13.925	0.000	1.8072	1.861	2.0971	No SC
Labor-intensive	*MTB*	0.795	32.613	0.000	1.8072	1.814	2.097	No SC
Construction and Materials	*MVA*	0.853	42.625	0.000	1.8072	2.030	2.097	No SC
Food and Beverages	*Qratio*	0.666	13.631	0.000	1.8072	2.042	2.0971	No SC
Industrial goods (manufacturing)	*MTB*	0.691	19.762	0.000	1.8072	2.246	2.0971	Negative SC
Retail	*MVA*[1]	0.961	190.257	0.000	1.8072	1.849	2.0971	No SC
Technology	*ROEKE*	0.932	69.091	0.000	1.8072	1.961	2.0971	No SC

[1] *Value from first round estimation.*

Table 4 shows that the shareholder value creation measure deemed most appropriate differs for each industry or type of firm. The differences in the preferred shareholder value creation measures between the various industries attest to the differences between firms in the various industries and suggest that a specific shareholder value creation measurement is best suited to explain variations in shareholder value creation for each specific industry. The shareholder value creation measure *ROEKE* seems to perform best with firms that are capital intensive, and with Technology sector firms.

All firms were included in Sample 1 and the results for the shareholder value creation measurement for this sample suggests that for the performance analysis of a general set of firms – where no particular characteristic is deemed to be held in common – *MTB* is the best shareholder value creation measurement. This model does, however, include negative serial correlation, reducing the efficiency of the model. Similarly, for labor-intensive firms, *MTB* was the best shareholder value creation measurement, bearing in mind that labor-intensive firms are a much broader category than capital-intensive firms. The *MTB* was also the best shareholder value creation measurement for the Manufacturing sector, which is both broad in scope and relatively labor-intensive. For firms with positive EVA values, as well as for firms in the Food and Beverages sector, the *Qratio* is the preferred shareholder value creation measurement. Lastly, *MVA* was found to best express shareholder value creation in the Construction and Materials industry, as well as in the Retail sectors. Overall, based on the analysis in this study, the use of *MAR* could not be justified as a shareholder value creation measure to express shareholder value creation. *MTB* can be used for three of the nine categories of firms, while the *Qratio*, *ROEKE* and *MVA* each featured as the preferred shareholder value creation measurement for in two industries. Most of the shareholder value creation measures performed well in terms of overall fit, with adjusted R^2 values exceeding 60%.

Based on the above analyses, **Hypothesis 1 was accepted,** namely that each industry has a shareholder value creation measurement that best explains shareholder value creation for that particular industry. This finding implies that shareholders should note that each industry has a specific shareholder value creation measure which can be applied as a yardstick to assess their value increases (or decreases) resulting from management's actions, for example, in the Food and Beverages industry the *Qratio* should be used, the in the

Industrial goods industry the *MTB* ratio and the Technology industry the *ROEKE*.

4.4 Regression results

Table 5 below presents the regression coefficients for the preferred models, as well as their levels of significance. Note that a large number of coefficients were found not to be significant and that a number of significant regression coefficients have values close to zero. This seems to indicate that many of the models may be over-specified, in other words, the model includes too many independent variables.

There is little evidence to indicate that a particular independent variable should be included in all the samples, or that a particular independent variable should be excluded completely. However, some patterns can be discerned. Some independent variables are positively significant in one industry (*ROA* in the Industrial good sector) but negatively significant in other industries (*ROA* in all firms, labor-intensive firms and the Food and Beverages sector). However, value drivers such as the *Spread* (positive in four industries) and the *ROCE* (negative in five industries) were found to be predominately of one sign.

For labor-intensive firms, and industries which are typically labor-intensive, such as Food and Beverages and Industrial goods (manufacturing), *ROA* was significant. A possible reason for this might be the fact that these industries are by the very nature of their activities heavily invested in assets, which play a big

Table 5. Regression statistics for preferred models

Independent Variable	Coefficient								
	All firms	Positive EVAs	Capital-intensive	Labor-intensive	Construc-tion and Materials	Food and Beverages	Industrial goods (manufac-turing)	Retail	Technology
	MTB	Qratio	ROEKE	MTB	MVA	Qratio	MTB	MVA[1]	ROEKE
EBEI (a)	0.0000	0.0000 *	0.0000 **	0.0000	0.000 *	0.0000	0.0000	0.000 *	0.0000
EPS (a)	0.0000 **	0.0000	0.0000	-0.0050	-0.0010	0.0010 *	0.0000	0.0000	0.0080
EVA (e)	0.0000 *	0.0000 *	0.0000	0.0000 *	0.0000 **	0.0000	0.0000 *	0.0000	0.0000
GEVA (e)	0.0020	0.0010	-0.0050 **	0.0200	0.0010 **	0.0000	-0.0010	0.0290	0.0200
NI (a)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0 .0000**
NOPAT (a)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 *	0.0000	0.0000 **
REVA (e)	0.0000	0.0000 *	0.0000	0.0000 *	0.0000 *	0.0000	0.0000	0.0000	0.0000
ROA (a)	-0.4040 *	0.0280	-0.0090	-0.6000 *	0.0950	-0.0200 *	0.1070 *	-0.1810	-0.1190
ROCE (e)	-0.0430 **	-0.0020 **	0.0060 **	-0.0400 **	-0.0060 *	-0.0020	-0.0040 *	-0.1250	0.0020
ROE (a)	-0.0010	0.0000	0.0000	-0.0060 *	-0.0020	-0.0010	0.0000	-0.0180 *	-0.0060
Spread (e)	0.1220 **	0.1380 *	0.1300 *	0.0120	-0.0020	0.0010	-0.0820 *	0.2540	0.2470 *
					Regression statistics				
Adj. R^2	0.658	0.496	0.629	0.795	0.831	0.666	0.564	0.731	0.932
p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DW	2.125	1.943	1.861	1.814	2.032	2.042	2.263	1.880	1.961

* Significant at a 5% level.

** Significant at a 10% level.

[1] *Value from first round estimation.*

'(a)' refers to accounting-based variables and '(e)' refers to economic-based variables

role in their value creation and profitability. Firms with a positive EVA, capital-intensive firms and the Technology sector (also typically capital-intensive) share a significant independent variable, namely the *Spread*. For these industries, competition might be a big factor, and therefore the spread between returns and costs is a determining factor, more than in other industries, of their value creation capabilities. In terms of the overall presence of significant coefficients, *ROE* performs poorly as value driver and was found to be significant only for labor-intensive firms and Retail firms. For five industries, there were thus five independent variables that were significant.

In total there were 36 significant appearances of independent variables (15 accounting-based and 21 economic-based), or 20 appearances if the zero coefficients are omitted (seven accounting-based and 13 economic-based). Therefore, **Hypothesis 2, that economic-based variables have a higher impact than accounting-based indicators) was found to be true.**

When one analyzes the appearance of the different independent variables (value drivers) amongst the different shareholder value creation measurements, one can see that there is no fixed pattern and that every shareholder value creation measurement has a different set of significant value drivers. Therefore, **Hypothesis 3, that the value drivers depend on the shareholder value creation measure used, was found to be true.**

One can already deduce that each industry has a unique set of variables determining shareholder value (thereby addressing Hypothesis 4). However, although the analyses show that a number of models are significant overall in explaining the variation in the dependent variables, many of the individual coefficients were found not to be significant. This hints at over-specification in the models and provides an interesting opportunity for further analyses – focusing on identifying which independent variables are most suited for each industry and type of shareholder value creation measurement, so as to identify the significant variables that explain shareholder value creation for each industry.

4.5 Solving over-specification

The second round estimation revealed that although the preferred estimations were all significant in terms of the joint significance of the independent variables (as shown by the F-test), most of the independent variables were found not to be significant or to be very close to zero. This is typical of models which are over-specified. One solution to the problem of over-specification is to reduce the number of independent variables. There are a number of ways in which the independent variables can systematically be removed. One such method, and the one employed in this analysis, is the backward elimination stepwise procedure. In this method, an initial model is estimated with all the possible independent variables. The least significant independent variable is then removed from the model and the model is re-estimated. This is done iteratively until all independent variables are found to be significant. One must, however, bear in mind that a mechanical methodology such as this may eliminate variables which are theoretically significant. An additional F-test for redundancy was therefore also included in the analysis. Under the null hypothesis of this test, the group of independent variables dropped from a model are jointly redundant as a group, and therefore these variables do not have to be included in the model. The results of this analysis are presented in Table 6.

Table 6. Final Fixed Effects Model Estimation

Sample	Shareholder value creation measure	Adj. R^2	Model significance		Redundancy		Durbin-Watson			
			F-value	p-value	F-value	p-value	LDW	DW	UDW	SC
All firms	***MTB***	0.658	19.587	0.000	0.861	0.487	1.9003	2.124	2.0682	Negative SC
Positive EVAs	***Qratio***	0.497	10.544	0.000	0.658	0.708	1.8734	1.913	2.0791	No SC
Capital-intensive	***ROEKE***	0.634	16.944	0.000	0.416	0.911	1.8072	1.858	2.0971	No SC
Labor- intensive	***MTB***	0.797	35.239	0.000	0.073	0.990	1.8072	1.808	2.0971	No SC
Construction and Materials	***MVA***	0.856	51.058	0.000	0.394	0.883	1.8072	2.034	2.0971	No SC
Food and Beverages	***Qratio***	0.669	17.581	0.000	0.899	0.509	1.8072	2.049	2.0971	No SC
Industrial goods (manufacturing)	***MTB***	0.694	21.855	0.000	0.124	0.993	1.8072	2.243	2.0971	Negative SC
Retail	***MVA***[1]	0.958	242.063	0.000	1.358	0.217	1.8072	2.889	2.0971	Negative SC
Technology	***ROEKE***	0.935	92.908	0.000	0.291	0.917	1.8072	1.941	2.0971	No SC

[1] *Value from first round estimation.*

From Table 6, the F-test for redundancy determined the final selection of dropped independent variables – the ones that were redundant under the null hypothesis for each of the preferred models. In each estimation, the F-test for joint significance found that the remaining independent variables were jointly significant in their respective models. The DW test statistics show that for all except three of the final preferred models, no serial correlation was present. Negative serial correlation persisted in models for all firms, Industrial goods and Retail firms. A general improvement in the adjusted R^2 values – albeit small – was also found. Most of the samples had models with explanatory power in excess of 60%, with the exception of firms with positive EVAs. The small improvements in the R^2 values may bring into question the necessity of the stepwise procedure, but an analysis of the model coefficients and their significance revealed vast improvements in the overall validity and explanatory power of the models as well as the individual validity of the independent variables in each model. Therefore, based on the above analysis, **Hypothesis 1 was still found to be true,** namely that for each industry, there is a shareholder value creation measurement that best explains shareholder value creation for that particular industry. In addition to an industry-specific shareholder value creation yardstick for management, portfolio managers have now a specific shareholder value creation measure they can use to measure the success of the management of a given industry and can therefore make more prudent assessments and recommendations to their clients regarding investment in given industries or firms.

Table 7 below presents the values and significance of the regression coefficients in each model. The table shows a significant reduction in the number of independent variables in each of the preferred models. In addition, it shows that all but four of the coefficients are now significant at least at a 10% level of significance. In terms of magnitude, zero-valued coefficients have been eliminated. In the four instances where the coefficients were found not to be significant, after conducting redundancy tests with these variables, it was found that the variables could not be classified as jointly redundant and they were therefore not dropped from their respective models. This may be due to the theoretical significance of these variables to the specific features of the samples in which they were included.

Table 7. Regression Statistics Following Stepwise Reduction of Independent Variables

Independent variable	Coefficient								
	All firms	Positive EVAs	Capital-intensive	Labor-intensive	Construction and Materials	Food and Beverages	Industrial goods (manufacturing)	Retail	Technology
	MTB	Qratio	ROEKE	MTB	MVA	Qratio	MTB	MVA[1]	ROEKE
EBEI (a)	x	0.0001 *	x	x	x	x	x	x	x
EPS (a)	0.0001 *	x	x	x	-0.0010 **	0.0006 *	x	x	x
EVA (e)	0.0006 *	-0.0003 *	x	0.0023 *	0.0018 **	0.0001 *	0.0007 **	x	-0.0033
GEVA (e)	0.0015 **	x	-0.0048 **	x	x	x	x	x	X
NI (a)	x	x	x	-0.0004 *	x	x	x	x	0.0032
NOPAT (a)	x	x	x	0.0005 **	-0.0021 *	x	-0.0007 **	x	-0.0175 **
REVA (e)	0.0000 **	x	x	-0.0004 *	x	x	x	x	x
ROA (a)	-0.4060 *	x	x	-0.5911 *	x	-0.0205 *	0.1070 *	x	-0.1252
ROCE (e)	-0.0430 **	-0.0024 **	0.0061 **	-0.0399 **	x	x	-0.0037 *	-0.1322 *	x
ROE (a)	x	x	x	-0.0062 *	x	-0.0009 *	x	-0.0175	-0.0047
Spread (e)	0.1212 **	0.1395 *	0.1224 *	x	x	x	-0.0816 *	0.2555 *	0.2512 *
Regression statistics									
Adj. R^2	0.658	0.497	0.634	0.797	0.856	0.669	0.694	0.958	0.935
p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DW	2.124	1.913	1.858	1.808	2.034	2.049	2.243	2.889	1.941

* Significant at a 5% level.
** Significant at a 10% level.
[1] *Value from first round estimation.*
'(a)' refers to accounting-based variables and '(e)' refers to economic-based variables

The unique combination of independent variables in each of the samples attests to the different independent variables' ability to capture the unique features in each industry. The independent variables *EVA*, *ROCE* and *Spread* (all three economic-based variables) appeared most often (six times each), leading to the conclusion that these are more general indicators which easily fall into any sample. On the other hand, *EBEI* seems to be a much more specialized indicator, relevant only to firms with a positive EVA value or to firms in the Retail sector. The capital- and labor-intensive firms seemed to almost mutually exclusive in terms of their independent variables, with only *ROCE* being present in both samples. This is probably due to the vastly different methods of operation used in capital- and labor-intensive firms. The retail sector requires a large number of independent variables, possibly due to the broad number of activities which feed into the retail sector. In total, there were 42 significant appearances of independent variables (18 accounting-based and 24 economic-based). Therefore, **Hypothesis 2, that economic-based variables have a higher impact than accounting-based indicators) was once again found to be true.**

Further, it would seem that the information requirement of each shareholder value creation measure differs greatly. The value creation measure *MVA* and the *Qratio* require very little information in order to explain their variation (three and four independent variables respectively), while *ROEKE* and *MTB* have significantly larger information requirements (five and seven independent variables respectively). This may be indicative of the unique features of each specific shareholder value creation measurement. Therefore, **Hypothesis 3, that the value drivers (independent variables) depend on the specific shareholder value creation measurement used, was once again found to be true.**

In order to address Hypothesis 4 (that every different industry or sector should have a different set of value drivers), Table 8 was compiled. Table 8 summarizes the significant value drivers for each industry in a declining order of appearance.

Table 8: Significant variables per industry

All firms	Positive EVAs	Capital-intensive	Labor-intensive	Construction and Materials	Food and Beverages	Industrial goods (manufacturing)	Retail	Technology
MTB	**Qratio**	**ROEKE**	**MTB**	**MVA**	**Qratio**	**MTB**	**MVA**	**ROEKE**
EVA (e)	EVA (e)		EVA (e)	EVA (e)	EVA (e)	EVA (e)		EVA (e)
ROCE (e)	ROCE (e)	ROCE (e)	ROCE (e)			ROCE (e)	ROCE (a)	
Spread (e)	Spread (e)	Spread (e)				Spread (e)	Spread (e)	Spread (e)
ROA (a)			ROA (a)		ROA (a)	ROA (a)		ROA (a)
			NOPAT (a)	NOPAT (a)		NOPAT (a)		NOPAT (a)
			ROE (a)		ROE (a)		ROE (a)	ROE (a)
EPS (a)				EPS (a)	EPS (a)			
			NI (a)					NI (a)
GEVA (e)		GEVA (e)						
REVA (e)			REVA (e)					
	EBEI (a)							

'(a)' refers to accounting-based variables and '(e)' refers to economic-based variables

Table 8 shows that the *EVA* (e) was a significant variable in seven of the nine industries, whilst *ROCE* (e) and the *Spread* (e) is significant in six of the nine industries. Note that all three of these variables are economic-based variables, and that the *ROA* (a), *NOPAT* (a), *ROE* (a) and *EPS* (a) (all accounting-based variables) each appeared four or three times.

Labor-intensive industries have seven different variables explaining shareholder value creation, the Technology industry has six, whereas capital-intensive firms, the Construction and Materials industry and the Retail industry each has three significant value drivers. However, despite the repeating appearances of a number of variables, there is no single industry that has the exact same set of value drivers as another industry. Therefore, one can **accept Hypothesis 4, that each industry has a unique set of variables that explain shareholder value creation.**

The implication of this finding is that management can concentrate on the specific significant value drivers that increase (or decrease) the shareholder value creation measure for a specific industry. The applications of this finding will be addressed in the conclusion to this study.

5. Conclusion

The present study set out to refine the search for a fair and equitable shareholder value creation measurement, a measurement that is applicable to a particular industry or firm. In order to achieve this objective, the current study analyzed more shareholder value creation measurements than have been addressed in previous studies, and applies these shareholder value creation measurements to nine different categories of firms.

The literature overview of shareholder value creation measurements revealed the development of a substantial number of measures and a large number of studies that attempted to analyze, prove, disprove or provide results and findings to shareholders, industry, academia and the creators of the applicability of these shareholder value creation measures. The results of the present study are significant and fill a gap in literature, as previous studies used mainly homogenous samples, in contrast to the present study which analyzes nine different categories of firms with five different shareholder value creation measurements, namely *MAR, MTB, MVA, Qratio* and *ROEKE*. It was demonstrated that a stock return (*MAR*) is not an appropriate measurement of shareholder creation, The results of this study indicate that each industry does have a specific shareholder value creation measurement that best explains shareholder value creation for that industry; for example, for South African firms with a positive EVA and for the Food and Beverages industry, the *Qratio* is the best measure, whilst for capital-intensive firms and the Industrial sector, the *MTB* was found to be a better measure of shareholder value creation than other measures tested. In addition, economic-based value drivers were found to be more significant than accounting-based value drivers in explaining shareholder value creation. Lastly, it was found that each industry does have a unique set of variables determining shareholder value creation.

The method of this study provides a refined method for analyzing shareholder value creation measures. It shows that results do indeed vary when different shareholder value creation measures are used and that the same set of results is unlikely if different industries are analyzed.

Based on the results of this study, a number of recommendations can be made. Firstly, portfolio managers can now use a specific shareholder value creation measurement as one of their portfolio selection criteria. In addition, portfolio managers need to take into account the different value drivers of industries in their analyses and recommendations. For use in an industry-specific analysis by portfolio managers, it has been established that economic-based value drivers such as *EVA, ROCE* and the *Spread* explain shareholder value creation better than accounting-based indicators such as *ROA, NOPAT, ROE* and *EPS*. Secondly, for management, the value drivers presented in Table 8 present a clear indication of industry specific variables upon which they can concentrate in their operating activities to most efficiently increase shareholder value. For example, the management of a firm in the retail sector should use *MVA* as shareholder value creation measurement and concentrate on the *ROCE* and the *Spread* to increase shareholder value, while the management of a firm in the industrial goods (manufacturing) industry must use the *MTB* ratio as shareholder value creation measurement and concentrate on the *EVA, ROCE, Spread, ROA* and *NOPAT* as significant value drivers. Finally, the compensation yardsticks used for managerial compensation can be aligned with a particular industry. For example, the management of firms in the Construction and Materials industry or in the Retail industry could be compensated based on the *MVA* of their firms, the management of Technology firms could be compensated using the *ROEKE* and the management of firms in the Industrial goods (manufacturing) industry will best be compensated if rewards are based on the *MTB*.

In conclusion, the results of this study suggest that the unique characteristics of each industry determine the optimal choice of shareholder value creation measurement, and that the managerial compensation yardstick used should embrace and adapt to this uniqueness. This paper concentrates only on financial performance measurements extracted from the financial statements of a firm, but it is recommended that managers and shareholders apply shareholder value creation measurement systems designed to capture information on all aspects of the business. Bryant *et al.* (2004) cite research that indicates that employees' actions and intangible assets (factors that are not captured by traditional performance measures) should be included in any comprehensive performance management system. Further research incorporating yet more shareholder value creation measurements, applying macro-economic factors and making provision for specific periods in the analysis might assist in the quest to find the most appropriate shareholder value creation measurement for a given firm.

References

Abdoli, M., Shurvarzi, M. and Farokhad, A.D. (2012), "Economic Value Added vs. Accounting Residual Income: Which One Is a Better Criterion for Measurement of Created Shareholders Value?", *World Applied Sciences Journal*, Vol. 17 No. 7, pp. 874-881.

Alloy Niresh, J. and Alfred, M. (2014), "The Association between Economic Value Added, Market Value Added and Leverage", *International Journal of Business and Management*, Vol. 9 No. 10, pp.126-133.

Arabsalehi, M. and Mahmoodi, I. (2012), "The quest for superior financial performance measures", *International Journal of Economics and Finance*, Vol. 4 No. 2, pp. 116-126.

Baca, S.P., Garbe, B.L. and Weiss, R.A. (2000), "The rise of sector effects in major equity markets", *Financial Analysts Journal*, Vol 56 No. 5, pp. 34-40.

Bacidore, J.M., Boquist, J.A., Millbourn, T.T. and Thakor, A.V. (1997), “The search for the best financial performance measure”, *Financial Analysts Journal*, Vol. 53 No. 3, pp. 11-20.

Baltagi, B.H. (2008), *Econometric analysis of panel data*, Wiley, New York.

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, pp. 251-264.

Biddle, G.C., Bowen, R.M. and Wallace, J.S. (1997), “Does EVA® beat earnings? Evidence on associations with stock returns and firm values”, *Journal of Accounting and Economics*, Vol. 24 No. 3, pp. 301-336.

Bryant, L., Jones, D.A. and Widener, S.K. (2004), “Managing value creation within the firm: an examination of multiple performance measures”, *Journal of Management Accounting Research*, Vol. 16 No. 1, pp. 107–131.

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. 9 No. 3, pp. 318-333.

Chmelikova, G. (2008), “Economic Value Added versus traditional performance metrics in the Czech food-processing sector”, *International Food and Agribusiness Management Review*, Vol. 11 No. 4, pp. 49-65.

De Villiers, J.U. and Auret, C.J. (1998), “A comparison of EPS and EVA as explanatory variables for share price” *Journal for studies in Economics and Econometrics*, Vol. 22 No. 2, pp. 47-63.

De Wet, J.H.v.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.

Erasmus, P. (2008), "The relative and incremental information content of the value-based financial performance measure Cash Valued Added (CVA)", *Management Dynamics*, Vol. 17 No. 1, pp. 2-15.

Gupta, V. K. and Sikarwar, E. (2016), "Value creation of EVA and traditional accounting measures: Indian evidence", *International Journal of Productivity and Performance Management*, Vol. 65 No. 4, pp. 436-459.

Hall, J.H. (1999), "Correlating internal and external performance yardsticks in the evaluation of corporate wealth creation", *Meditari Accountancy Research*, Vol. 7, pp. 123-143.

Hall, J.H. (2013), "Toward improved use of value creation measures in financial decision-making', *Journal of Applied Business Research*, Vol. 29 No. 4, pp. 1175–1188.

Hall, J.H. (2016), "Industry-specific determinants of shareholder value creation", *Studies in Economics and Finance*, Vol. 33 No. 2, pp.190-208.

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.

Jensen, M.C. and Murphy, K.J. (1990), "Performance pay and top-management incentives", *Journal of Political Economy*, Vol. 98 No. 2, pp. 225–264.

Kumar, S. and Sharma, A.K. (2011), "Further evidence on relative and incremental information content of EVA and traditional performance measures from select Indian companies", *Journal of Financial Reporting & Accounting*, Vol. 9 No. 2, pp. 104–118.

Kyriazi, D. and Anastassis, C. (2007), "The validity of the Economic Value Added approach: An empirical application", *European Financial Management*, Vol. 13 No. 1, pp. 71-100.

Lee, L. and Kim, W.G. (2009), “EVA, refined EVA, MVA, or traditional performance measures for the hospitality industry?”, *International Journal for Hospitality Management*, Vol. *2*8 No. 3, pp. 439-445.

Maditinos, I.D., Sevic, Z. and Theriou, N.G. (2009), “Modeling traditional accounting and modern value-based performance measures to explain stock market returns in the Athens stock exchange (ATE)”, *Journal of Modelling in Management*, Vol. 4 No. 3, pp. 182-201.

McGahan, A.M. and Porter, M.E. (1997), “How much does industry matter, really?”, *Strategic Management Journal*, Vol. 18 No. 16, pp. 15-30.

Milbourn, T.T. (2003), “CEO reputation and stock-based compensation”, *Journal of Financial Economics*, Vol. 68 No. 2, pp. 233–262.

Milunovich, S. and Tsuei, A. (1996), “EVA in the computer industry”, *Journal of Applied Corporate Finance*, Vol. 9 No. 1, pp. 104-115.

Myers, R. (1997), “Measure for measure”, *CFO Magazine*, November, pp. 18-23.

O’Byrne, S.F. (1996), “EVA and market value”, *Journal of Applied Corporate Finance*, Vol. 9 No. 1, pp. 116-125.

Schmalensee, R. (1985), “Do Markets differ much?”, *The American Economic Review*, Vol. 75 No. 3, pp. 341-351.

Sharma, A.K. and Kumar, S. (2010), “Economic Value Added (EVA) – Literature review and relevant issues” *International Journal of Economics and Finance*, Vol. 2 No. 2, pp. 200-220.

Stern, J. (1993), “Value and people management”, *Corporate Finance*, July, pp. 35-37.

Stewart, G.B. (1991), *The quest for value: the EVA™ management guide*, Harper Business, New York, NY.

Stewart, G.B. (1994), “EVA: Fact or fantasy”, *Journal of Applied Corporate Finance*, Vol. 7 No. 2, pp. 71–84.

Visaltanachoti, N., Luo, R. and Yi, Y. (2008), “Economic Value Added (EVA®) and sector returns”, *Asian Academy of Management Journal of Accounting and Finance*, Vol. 4 No. 2, pp. 21-41.

Wernerfelt, B. and Montgomery, C.A. (1988), “Tobin’s Q and the importance of focus in firm performance”, *The American Economic Review*, Vol. 78 No. 1, pp. 246-250.

Worthington, A.C. and West, T. (2004), “Australian evidence concerning the information content of Economic Value Added”, *Australian Journal of Management*, Vol. 29 No. 2, pp. 201-223.