

Article

Evaluating the Relationship between Accounting Variables, Value-Based Management Variables, and Shareholder Returns: An Empirical Approach

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Abstract: This study assessed the accounting-based variables and value-based management (VBM) variables that jointly affect firm value and performance. The study applied the causality test and variance decomposition to determine the variability of the variables, and further empirically employed fully modified ordinary least squares (FMOLS) and dynamic ordinary least squares (DOLS) techniques to justify the results. Data covering 356 industries were purposively sampled to arrive at 61 companies spanning 2011–2020. Overall, the causality test found no relationship between economic value added and market value added but only found unidirectional causality from shareholder returns to MVA, EVA to shareholder returns, ROA to MVA, ROE to MVA, EVA to MVA, MVA to EVA, ROE to ROA, EVA to ROA, and EVA to ROE. A very strong bidirectional causality relationship was found between return on asset and shareholder return as a measure of company performance. Further results from the forecast error of the variance decomposition showed that shareholder returns are explained only by its own shock, contributing 45.38 percent in the long run, while the remaining variables, namely market value added, return on asset, return on equity, and economic value added, contribute about 35.96%, 14.06%, 4.08%, and 0.51%, respectively, to predicting the future values of shareholder return. This confirms the relationships between the variables from the short run to the long run. Additionally, results from the FMOL and DOL revealed that all accounting variables and VBM are good approaches for evaluating company performance as the empirical result from ROA, ROE, and EVA revealed positive and significant relationships. This confirms that a combination of both variables would produce a better evaluation as the accounting variables and VBM variables jointly relate to shareholder returns. This study serves as a guide to companies' management and boards of directors in having better ways to evaluate company performance. Consequently, it is recommended that managers select combinations of accounting and VBM variables that suit their operations and jointly apply them in the performance evaluation of the company. This will be useful in providing both the relative and incremental performance information needed for diverse decision-making.

Keywords: economic value added; return on asset; company performance; firm value; return on equity; industrial companies; shareholder returns



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1. Introduction

Shareholders are value-driven and are interested in the value created and how this value can be sustained and enhanced. One of the most vital and significant management tasks is the evaluation of a company's performance, which must be reported periodically (Khosravi et al. 2014; Narkuniene and Ulbinaite 2018). This is necessary and germane because performance can be evaluated and measured for accountability and transparency to the owner of the company, the shareholders, and other stakeholders (Aslam et al. 2015).

In addition, performance evaluation demonstrates the degree to which the management of the company has been effective and efficient in putting the company strategy into practice in order to create value and sustain the value created (Correia 2019; Kusumawardani et al. 2021). Furthermore, performance evaluation is a process that employs specific indicators to assess management procedures, determine whether or not value is created, pinpoint necessary modifications, and improve the sustainability and enhancement of business operations (Uddin et al. 2022).

Moreover, performance evaluation measures the outcomes of company activities with the goal of identifying areas that need attention, monitoring performance, boosting motivation, increasing accountability, and improving communications with company stakeholders (Ambalangodage and Fie 2016; David and Jenson Joseph 2014). Since capital providers and company management depend on performance evaluation to make decisions about investing, financing, and dividends, it is, therefore, essential to businesses (Aggelopoulos and Grypeos 2016; Serebryakova et al. 2021). Reports on the stewardship of corporate organisations are highly important for the proper evaluation and accurate measurement of company performance. The increase in the need for performance arose immediately after the failure of many big corporations such as Enron, WorldCom, and Parmalat in 2002. These corporate failures created a dent in the image of accountants and auditors. Stakeholders were questioning where the company accountants and the internal and external auditors of those companies were. Why was the fraud not detected during the audit process? Thereafter, arguments were sparked in the accounting literature on the proper approach to measuring or evaluating performance.

Many techniques that are currently classified as accounting variables and VBM variables were developed as a result of the search for better methods of evaluating the performance of businesses. Moreover, a number of studies have concentrated on identifying the better of the two groups (Rasool et al. 2021). Nevertheless, these studies have led to rivalries and feelings of superiority between them due to conflicting research results. Some studies concluded that accounting methods outperform VBM, while others did not. The differences between the two methods lie in the fact that VBM offers a company's long-term report, whereas the accounting variables offer a short-term one. Another point of contention is that although VBM focuses on value creation, accounting variables produce financial profit results. The fact that the two models produce different outcomes when used to assess a company's performance adds yet another point of contention. When the VBM technique is used, a company that reports profit using accounting variables may report that no value has been created, according to Rakshit et al. (2017). The implication thereof is that if the VBM approach is used in the evaluation, company performance data—which are based solely on accounting variables—such as those of industrial companies, may differ. Consequently, there is a need for an approach that provides comprehensive results of a company's performance (Narkuniene and Ulbinaite 2018). This study fills that gap. Utilising industrial companies listed on the Johannesburg Stock Exchange (JSE) as the case study, this research aims to resolve the debate over which approach is better by developing joint accounting and VBM variables that enhance companies' value creation.

It is highly desirable and necessary to have methods for evaluating how well a company is performing in order to enhance and sustain the creation of value for shareholders in the current era of advanced information technology and a globalised business environment (Jenson et al. 2019). In order to integrate accounting and value-based management variables for industrial companies, this research aims to evaluate the causal relationship between the accounting model, VBM model, and shareholder return. The study specifically looked at the causal relationship between VBM variables and accounting variables with shareholder returns, which serve as a stand-in for value creation. The study also looked at which of these variables could explain the value creation of the industry collectively. This research was conducted because it is necessary to choose performance evaluation methods that can help stakeholders in the company make different kinds of management decisions. The rest of the paper is organised as follows: Section 2 provides the literature review, while the

research methodology and data analysis are presented in Section 3. Section 4 proffers the discussion, recommendation, and conclusion.

2. Literature, Theoretical, and Conceptual Review

Historically, Luca Pacioli (1447–1517), introduced the double-entry bookkeeping system in 1494 as the precursor to the concept of performance evaluation. Pacioli's development of the double-entry bookkeeping system led to the development of several methods for assessing business performance over the course of the previous 500 years (Euske and Zander 2005; Matsoso and Benedict 2016; Narkuniene and Ulbinaite 2018). Furthermore, it has been noted that from Pacioli's time until the early 1900s, the primary purposes of performance evaluation were the control of a company's cash flow and the assessment of profit performance (Euske and Zander 2005; Jovic and Tomasevic 2021; Matsoso and Benedict 2016). However, the rise of corporate organisations like industrial companies, where management and shareholders are kept apart, created the need for a method that reveals a company's performance in terms of the value created for shareholders (Burešová and Dvořáková 2014; Signori et al. 2021). Value creation is defined as management's capacity to produce income above the opportunity costs of all capital—including debt and equity—that is utilised in the business's operations (Fathabadi et al. 2014). Currently, there are two aspects that can be found in company performance evaluation models: non-financial and financial (Ambalangodage and Fie 2016; Ismail 2013; Kori et al. 2020). Non-financial models are employed to assess processes like innovation, internal coordination, goodwill, and other companies' brand image. Additionally, financial models are employed to assess the financial performance of businesses using data taken from their financial statements, including the various kinds of payments made to a company's stakeholders. Nonetheless, the financial component of performance evaluation is the main emphasis of this study. Moreover, this study is aligned with the Agency Theory to support the above-stated models, as propounded by Meckling and Jensen (1976).

Moreover, the accounting model and the VBM model can be used to classify the financial model of performance evaluation. The accounting model emphasises a company's financial results, whereas the VBM model focuses on analysing company performance in terms of the value created for shareholders, according to Koc (2017) and Serebryakova et al. (2021). A manager should always aim to make gains that exceed the total costs of the investment, and the VBM model of management accounting aligns investment value with capital cost (Beck 2014). Additionally, accounting variables used to assess the performance of businesses were disclosed by various authors (Jovic and Tomasevic 2021; Ongeru 2014; Panigrahi et al. 2014). These variables included return on investment (ROI), earnings per share (EPS), return on net worth (RONW), return on equity (ROE), return on assets (ROA), and return on capital employed (ROCE). The accounting model was useful in the industrial era for assessing company performance but it is currently deemed inadequate for furnishing the necessary data on company performance in the information, communication technology, and globalised era (Goshu and Kitaw 2017; Harrison and Wicks 2013). On the other hand, Hall (2002) and Hall (2023) revealed that industrial businesses need performance evaluation models that prioritise value creation over profit-making because they are capital-intensive and appropriate for the use of VBM models. One of the accounting model's limitations is that it only presents short-term management information, as opposed to the VBM model, which shows shareholders' expected performance of a company in the future (Al-Matari et al. 2014; Ambalangodage and Fie 2016; Faiteh and Aasri 2023).

Moreover, the accounting model drawbacks included their promotion of short-term planning, lack of strategic focus, disregard for the proportion of debt-to-equity capital, and failure to take risk into account when making any kind of investment (Goshu and Kitaw 2017; Myskova and Hajek 2017). As a result, the accounting model's limitations highlight the possibility that some judgements made based on model results may not be ideal and may even contribute to the global rate of financial distress leading to increasing rates of delisting and corporate failure. Additionally, the inadequacies found in the accounting

model imply that businesses—like those in South Africa’s industrial sector listed on the Johannesburg Stock Exchange (JSE) that continue to use the accounting model in their performance evaluation—might not be providing accurate and thorough information about their performance. Therefore, a value creation-infused performance evaluation model is necessary.

Recently, there has been rising corporate financial distress that has led to daily increasing numbers of delisting companies from the Johannesburg Stock Exchange, which can be related to limited or inadequate performance evaluation. Nonetheless, several writers (Jovic and Tomasevic 2021; Narkuniene and Ulbinaite 2018; Panahi et al. 2014; Rajnoha et al. 2016; Reddy 2013) have linked the current focus on value sustainability and shareholder value creation offered by the VBM model to the shortcomings of the accounting model. The collapse of major international corporations like WorldCom and Enron over the last two decades ago and allegations of unethical executive compensation were catalysts for the spread of various performance evaluation models (Burešová and Dvořáková 2014; Deo 2015). These aforementioned authors further claimed that rather than offering answers, the various performance evaluation models now in use have sparked new debates. These companies’ failures were caused by poor strategic choices that were based on unreliable performance data obtained from the use of inappropriate performance evaluation models (Burešová and Dvořáková 2014; Deo 2015). This circumstance highlights the need for a performance evaluation model that combines the VBM and accounting models in order to improve value creation and provide more thorough data on business performance to support better strategic decision-making. Consequently, it is necessary to have a multi-criteria performance evaluation model that links to generating value for shareholders and is suitable for businesses operating in the rapidly evolving technological landscape, such as industrial companies (Ahblom 2017; Goncalves de Oliveira 2014; Narkuniene and Ulbinaite 2018; Rajnoha et al. 2016). Meanwhile, results from extant studies have been mixed so far and their arguments have been linked to incremental information content (Mohammad and Yousef 2023; Nakhaei 2018).

While incremental information content evaluates whether one accounting or VBM variable—or a set of variables—provides greater information content than that provided by another, relative information content identifies variables that provide greater information content than the other by comparing the information content of one variable with others (Mohammad and Yousef 2023; Nakhaei 2018). Therefore, incremental information determines whether one of the variables provides incremental information content if the information content of two different variables added together is greater than that of one variable alone. Additionally, relative information content determines whether a variable’s information content is higher than, equal to, or lower than the information content of a different variable by itself. Put differently, relative information content identifies which variable has a higher or better level of information content than the other, whereas incremental information content assesses whether a combination of accounting or VBM model variables provides more information content (Goel and Oswal 2020; Khan et al. 2016; Mohanty and Pattnaik 2016). In order to provide empirical evidence on the relative and incremental information content of the VBM variable MVA and the accounting model variables of net income (NI), NOPAT, and EPS, Nakhaei (2016) conducted a study on a sample of 395 non-financial companies listed in the main market of Bursa Malaysia between 2002 and 2011. The study’s findings demonstrated that, in comparison to VBM, accounting model variables had a higher relative information content with stock return. Likewise, Khan et al. (2016) examined the relative and incremental information contents of the debt-to-equity ratio (DE), ROE, ROA, OCF, and VBM variables in the accounting model in 28 non-financial companies listed at the Karachi Stock Exchange between 2009 and 2012. According to the study, the accounting model’s variables performed better than the VBM model in explaining changes in the stock prices of Pakistani companies.

Additionally, a study was conducted by Narkuniene and Ulbinaite (2018) to determine which model between the VBM and accounting models is better for assessing the perfor-

mance of businesses. The study employed panel data with ordinary least squares (OLS) regression to test the relative information content and incremental information of the VBM variables EVA and MVA and accounting variables ROA, ROE, and EPS in explaining stock returns. The study used a sample of 25 mining companies in ASEAN-5 during the period of 2007–2017. The study's findings, however, demonstrated that when it came to accounting variables that explained stock return, ROA and ROE performed better than MVA and EVA. Similarly, [Nakhaei \(2018\)](#)—whose study covered 395 non-financial companies listed on the main market of Bursa Malaysia from 2006 to 2015 and focused on the relative and incremental information content of the VBM variable EVA and accounting variables ROA, ROE, and return on sales (ROS)—concluded that the study's findings did not support the idea that the VBM model is superior to the accounting model. This argument has helped the current study come up with the conceptual framework below. This study's conceptual framework to solve the research problem is presented in Figure 1. The dynamic interaction between the independent variable—shareholder return—and the variables of the VBM and accounting models forms the basis of this study's model, as illustrated in Figure 1. Additionally, the integrated performance evaluation model was developed with consideration for the [Barr \(2021\)](#) performance evaluation principles. This study adopted different variables to ascertain whether similar results would be achieved. From the figure, it is revealed that combinations of both approaches improve information content regarding the performances of companies. Therefore, this study supports combinations of both models since it has been proven that both approaches increase corporate performance. This study's findings also revealed that both approaches support performance, with accounting variables taking the lead by providing more incremental information than VBM variables.

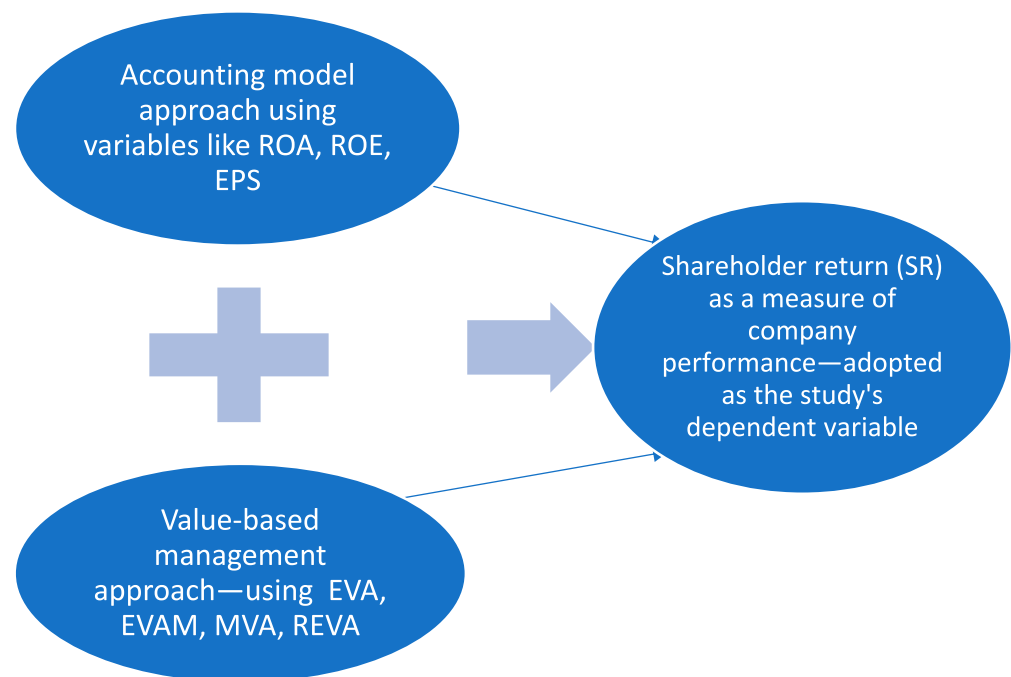


Figure 1. Conceptual framework depicting maximising shareholder return through accounting and VBM models. Source: authors' research.

3. Data and Methodology

3.1. Data

The present study explores the accounting-based variables and value-based management variables that jointly affect firm value and performance in a panel dataset of 61 South African companies¹ spanning 2011–2020. The timeframe and company selection are primarily dictated by the availability of data. The dependent variable is shareholder return (SR), proxied by company performance. The main explanatory variables in this research

are market value added (MVA), measured by the difference between the market value of a company's equity and market value; returns on asset (ROA), measured by earnings after tax divided by total assets; returns on equity (ROE), measured by earnings after tax divided by shareholder equity; and economic value added (EVA). The dataset for this research is drawn from the Johannesburg Stock Exchange (JSE). Table 1 displays the summary statistics and correlation matrix for the variables under scrutiny. The statistical analysis shows that the mean value of shareholder returns is 1.575 with a standard deviation of 1.174, indicating a moderate variation in the considered countries. Similarly, the average values of market value added, return on asset, returns on equity, and economic value added are 0.251, 2.536, 2.781, and 11.702, respectively, with a standard deviation of 0.494, 0.765, 0.622, and 2.169, respectively. Specifically, the highest and lowest averages are economic value added and market value added, respectively, for the period under investigation. The correlation analysis is further reported in the lower panel of Table 1. The analysis indicates that all the variables are positively correlated with shareholder returns except market value added, which is negatively correlated with shareholder returns. In addition, the analysis revealed no evidence of multicollinearity between the variables, given that the variable values were moderately low.

Table 1. Descriptive statistics and correlation matrix.

Variables	SR	MVA	ROA	ROE	EVA
Mean	1.576	0.251	2.536	2.781	11.702
Maximum	5.093	1.463	5.322	4.957	21.737
Minimum	0.000	1.309	3.218	0.357	4.322
Std.Dev	1.174	0.494	0.765	0.622	2.169
Obs					
Correlation matrix					
SR	1.000				
MVA	0.172	1.000			
ROA	0.028	0.036	1.000		
ROE	0.134	0.339	0.508	1.000	
EVA	0.049	0.245	0.096	0.137	1.000

3.2. Empirical Model and Methodology

This study formulates the reduced-form empirical equation to investigate accounting-based variables and value-based management variables that jointly affect firm value and performance:

$$\ln SR_{it} = \alpha_0 + \beta_1 \ln EVA_{it} + \theta_j \ln X_{it} + \varepsilon_{it} \quad (1)$$

where $i = 1 \dots 35$ and $t = 2011 \dots 2023$, SR_{it} represents shareholder return (SR) as the dependent variable, EVA_{it} signifies economic value added, X_{it} represents the vector of other remaining explanatory variables, α_0 is the constant, β_i represents the coefficients of economic value added, η_j is the coefficient of other variables, and ε_{it} represents the error term.

This study employs the fully modified ordinary least squares (FMOLS) and dynamic ordinary least squares (DOLS) methods developed by [Pedroni \(2001\)](#) and [Kao and Chiang \(2001\)](#) respectively. These techniques are widely acknowledged for their reliability and consistency in estimating cointegrated variables, thereby addressing concerns related to endogeneity and serial correlations amongst the variables. Furthermore, FMOLS and DOLS are not limited to a single integration of the order of variables. The DOLS technique specifically eliminates multicollinearity and serial correlation by incorporating lead and first-lag differences into the cointegration regression. As [Raihan and Tuspekova \(2022\)](#) stated, the error term is orthogonalized when leads and lags of different terms are included. Moreover, these methods offer greater flexibility when cointegrating vectors with heterogeneity in

the presence of the between-dimension “group mean” (Ajmi and Inglesi-Lotz 2020; Asghar and Irum 2012). The FMOLS proposed by Pedroni (2001) is expressed as follows:

$$\hat{\beta}_{FMOLS} = \frac{1}{N} \sum_{i=1}^N \left(\sum_{t=1}^T (x_{i,t} - \bar{x}_i)^2 \right)^{-1} \left(\sum_{t=1}^T (x_{i,t} - \bar{x}_i) y_{i,t}^* - T \hat{\gamma}_i \right) \quad (2)$$

where $x_{i,t}$ and $y_{i,t}$ are considered to be variables that are cointegrated with slope β_i in order to account for the individual specific effect. $\hat{\gamma}_i$ corrects the serial correlation term due to the heterogeneity dynamics and $y_{i,t}^*$ is the transformed variable of $y_{i,t}$ to circumvent the endogeneity problem. Similarly, the DOLS approach also takes care of the correlation between regressors and error terms by adding a first-lag difference to the cointegrated relationships. Hence, the DOLS is expressed as follows:

$$\hat{\beta}_{DOLS} = \frac{1}{N} \sum_{i=1}^N \left(\sum_{t=1}^T Z_{i,t} Z_{i,t}' \right)^{-1} \left(\sum_{t=1}^T Z_{i,t} (y_{i,t} - \bar{y}_i) \right) \quad (3)$$

where $Z_{i,t}$ denotes $2(k+1) \times 1$ vector of explanatory variables such as $(x_{i,t} - \bar{x}_i, \Delta x_{i,t-k}, \dots, \Delta x_{i,t+k})$.

3.3. Causality Test

This study further explored causal links amongst the considered variables of interest using the causality test proposed by Dumitrescu and Hurlin (2012). The causality test is robust to analyse unbalanced panel data and handles individual differences across countries or companies (Adalı and Yüksel 2017). Additionally, the approach also analyses Z-bar statistics, taking into account regression coefficient variability. According to this method, a panel causality test is a confirmation that the regression coefficients vary across cross-sectional units and the non-causality means they vary across cross-sectional units. The causality test is specified as follows:

$$Y_{it} = \beta_i + \sum_{n=1}^N \alpha_i^{(n)} Y_{it-n} + \sum_{n=1}^N \gamma_i^{(n)} X_{it-n} + u_{it} \quad (4)$$

where Y and X represent the outcome and explanatory variables, respectively, $\alpha_i^{(n)}$ and $\gamma_i^{(n)}$ denote the autoregressive and regression coefficients. Furthermore, the intercept term is represented by β_i , the lag operator is denoted by N , and the error term is symbolised by u_{it} . The study also utilised variance decomposition analysis for robustness' sake.

3.4. Empirical Results and Findings

The empirical analysis begins with an examination of cross-sectional dependence amongst the firms under investigation using the Bai et al. (2016) cross-sectional dependence (CSD) test. The findings of the CSD test are presented in Table 2, which demonstrates the existence of cross-sectional interdependency amongst firms, suggesting that a shock to one firm could potentially affect other firms in the industry.

Table 2. Cross-sectional dependence results.

Variables	Pesaran CD	Prob
SR	22.404 *	0.000
ROA	11.956 *	0.000
ROE	13.470 *	0.000
MVA	10.861 *	0.008
EVA	14.044 *	0.000

Note: *, **, and *** show significance levels for 1%, 5%, and 10% respectively.

Given the presence of cross-sectional dependence amongst firms, utilising a first-generation unit root test may produce misleading results. Accordingly, the researchers in this study employ the second-generation unit root test and the Cross-sectional Augmented Dickey–Fuller (CADF) test, proposed by [Pesaran \(2007\)](#), to determine the order of integration amongst the series. The results of the CADF test, presented in Table 3, indicate that all the variables are not stationary at this level, except economic value added. However, all the variables become stationary after subjecting them to the first difference.

Table 3. The results of the CADF unit root test.

	Level	First Difference
SR	−0.922	−5.150 *
ROA	−1.170	−4.281 *
ROE	−1.633	−5.190 *
MVA	−1.048	−3.509 **
EVA	−4.238 *	−7.316 *

Note: *, **, and *** show significance levels for 1%, 5%, and 10% respectively.

This study proceeds to assess the cointegration relationships between the variables using the [Westerlund \(2008\)](#) panel cointegration test as the dataset exhibits cross-sectional dependence and slope heterogeneity. The test yields four statistics: two group mean tests (G_t , G_a) and two panel mean tests (P_t , P_a). Table 4 reports the results of the Westerlund panel cointegration test. The findings reject the null hypothesis of no cointegration, implying the existence of a cointegration relationship between the variables.

Table 4. The results of the [Westerlund \(2008\)](#) panel cointegration test.

Statistics	1	2
G_t	−5.017 *	−4.483 *
G_a	−8.392 *	−6.810 *
P_t	−3.508 *	−3.749 *
P_a	−11.143 *	−10.284 *

Note: G_t and G_a represent the group mean tests. P_t and P_a denote panel mean tests. * Represents the 1% level of significance.

Subsequently, the researchers proceed to investigate the long-term coefficients of the variables using the FMOLS and DOLS techniques. Table 5 presents the results of the FMOLS and DOLS techniques, with shareholder returns serving as the dependent variable. The findings demonstrate that returns on assets and returns on equity exhibit a positive relationship with shareholder returns. This outcome suggests that an increase in the return on assets, which signifies a rise in the profitability of firms, triggers greater demand for the shares of the aforementioned companies amongst existing and potential investors, thereby enhancing company performance and shareholders' wealth. This conclusion also indicates that a rise in return on assets creates additional opportunities for selected firms in South Africa to expand their profitability framework and attract more investors, resulting in increased company sustainability and performance. This conclusion is consistent with the empirical findings of [Parhusip et al. \(2019\)](#), [Sukmawati and Garsela \(2016\)](#), and [Supriyadi \(2021\)](#) in their respective studies. Similarly, the estimated coefficients of returns on equity are positive and statistically significant for both techniques. This finding emphasises that elevating the returns on equity improves the profitability ratio of the aforementioned companies, which incentivizes more potential investors to purchase their shares, considering their future profitability, and, thus, increases the company's performance and sustainability. This outcome aligns with the empirical results of [Pakpahan \(2010\)](#), [Syah et al. \(2023\)](#), and [Kuswanto and Taufiq \(2010\)](#), who reached similar conclusions. The estimated coefficients of economic value added are positive and statistically significant across models, which implies that the rise in the economic market value of the considered firms, making the share-

holders happy and serving as a barometer for potential investors, leads to an increase in the company sustainability performance of the selected South African firms. This outcome also highlights that increasing the economic market value of the firms considered enhances shareholder wealth, which, thus, increases company sustainability and performance. This finding is supported by [Gupta and Sikarwar \(2016\)](#), [Al-Awawdeh and Al-Sakini \(2018\)](#), and [Basana et al. \(2020\)](#) in their investigations. On the other hand, the estimated coefficients of market value added are negative but statistically insignificant.

Table 5. Panel FMOLS and DOLS results.

FMOLS		DOLS		
Variables	Coeff	Prob	Coeff	Prob
C	0.254	0.183	0.635	0.118
ROA	0.139 *	0.000	0.223 *	0.000
ROE	0.830 **	0.041	0.159 **	0.023
MVA	0.172	0.299	0.105	0.372
EVA	0.641 *	0.000	0.355 *	0.000

Note: *, **, and *** show significance levels for 1%, 5%, and 10% respectively.

This study further assesses the causal linkages between the variables using the Dumitrescu and Hurlin causality tests. Table 6 reports the D-H causality test outcomes. The findings show that there exists a bidirectional causality between returns on assets and shareholder returns, which implies feedback between the variables. This outcome suggests that returns for shareholders are influenced by returns on assets. Alternatively, the increase in returns on assets of the considered companies enhances returns for shareholders. The causality outcomes further show that there exists a unidirectional causality from market value added to shareholder return; shareholder return to economic value added; market value added to returns on assets; market value added to returns on equity; returns on assets to returns on equity; and returns on assets to economic value added. The findings suggest that improvements in market value added can increase shareholder returns, returns on assets, and returns on equity. Similarly, these outcomes show that increasing economic value added can be influenced by shareholder returns. Moreover, this study also discovered that rising returns on assets increase returns on equity and economic value added. These results also show that increasing returns on equity can stimulate economic value added. However, the findings show that there is unidirectional causality from shareholder returns to market value added; economic value added to shareholder returns; returns on assets to market value added; returns on equity to market value added; economic value added to market value added; market value added to economic value added; returns on equity to returns on assets; economic value added to returns on assets; and economic value added to returns on equity. The outcomes suggest that neutral effects are discovered in causality tests run on the above-mentioned variables.

Finally, the study further extends the analysis by conducting the forecast error variance decomposition of the VAR approach. The forecast error variance decomposition (FEVD) determines the extent of variability in one endogenous variable explained by shocks in other variables. Table 7 presents the variation of all the variables explained only by the shocks in shareholder returns using 10-period horizons. In panel A of Table 7, the findings show that shareholder returns (lsr) are explained only by a firm's own shock, contributing 45.38 percent in the long run, thus suggesting that shareholder returns show strong endogeneity. The remaining variables, namely market value added, return on asset, return on equity and economic value added, contribute about 35.96%, 14.06%, 4.08%, and 0.51%, respectively, to predicting the future values of shareholder returns. Similarly, panel B shows that market value added indicates endogeneity compared to other variables in the system, which implies that market value added is subject to different company-related factors. Specifically, return on asset is reported to contribute significantly to the variation in market value added, followed by return on equity. Furthermore, the results show that market value

added contributes significantly to the changes in returns on assets and returns on equity, respectively, in panels C and D. Finally, these results show that economic value added responds simultaneously to its own shocks, estimated at about 38.86% of the fluctuations in the long run, and returns on assets are found to be the main determinants of explaining economic value added in the long run.

Table 6. Causality test results.

Path of Causality	Z-Bar	Prob
$ROA \neq SR$	5.191 *	0.000
$SR \neq ROA$	8.416 *	0.000
$MVA \neq SR$	3.350 **	0.037
$SR \neq MVA$	0.047	0.953
$EVA \neq SR$	1.039	0.369
$SR \neq EVA$	2.595 ***	0.092
$ROA \neq MVA$	0.706	0.494
$MVA \neq ROA$	4.492 *	0.011
$ROE \neq MVA$	0.734	0.480
$MVA \neq ROE$	9.028 *	0.000
$EVA \neq MVA$	1.605	0.204
$MVA \neq EVA$	1.923	0.150
$ROE \neq ROA$	0.064	0.937
$ROA \neq ROE$	3.074 **	0.047
$EVA \neq ROA$	0.457	0.627
$ROA \neq EVA$	2.954 **	0.058
$EVA \neq ROE$	1.574	0.211
$ROE \neq EVA$	2.309 ***	0.103

Note: *, **, and *** show significance levels for 1%, 5%, and 10% respectively.

Table 7. Variance decomposition results.

Panel A: VDC of LSR						
Period	S.E.	LSR	LMVA	LROA	LROE	LEVA
1	0.735413	100.0000	0.000000	0.000000	0.000000	0.000000
2	0.946021	97.86031	0.088154	0.178188	1.037762	0.835589
3	1.000506	94.29131	2.668015	1.083013	1.105728	0.851933
4	1.047252	86.35317	9.289157	1.964609	1.601426	0.791639
5	1.148863	72.48795	18.92715	5.671537	2.226301	0.687061
6	1.268264	60.82669	26.28598	10.04214	2.252552	0.592640
7	1.360519	53.58708	30.89655	13.02769	1.972034	0.516648
8	1.417646	49.51354	33.67758	14.27309	2.051333	0.484457
9	1.453451	47.10539	35.20111	14.37825	2.824520	0.490730
10	1.480914	45.38621	35.96391	14.05956	4.083551	0.506778
Panel MVA						
Period	S.E.	LSR	LMVA	LROA	LROE	LEVA
1	0.222674	13.99986	86.00014	0.000000	0.000000	0.000000
2	0.366996	14.54621	68.33968	15.64504	0.963884	0.505182
3	0.477333	14.85025	64.92925	19.18485	0.681292	0.354350
4	0.543539	13.57717	64.04044	21.20189	0.896551	0.283947
5	0.579171	12.33417	64.12085	20.93724	2.348934	0.258799
6	0.603257	11.37344	63.28245	19.87896	5.198545	0.266603
7	0.622863	10.67020	62.08833	18.71641	8.253995	0.271064
8	0.640181	10.11747	61.13618	17.77431	10.71353	0.258520
9	0.657181	9.797710	60.61565	17.08492	12.25073	0.250987
10	0.676640	9.750819	60.15647	16.82495	12.99768	0.270088

Table 7. Cont.

Panel C: ROA						
Period	S.E.	LSR	LMVA	LROA	LROE	LEVA
1	0.245145	0.107862	2.125134	97.76700	0.000000	0.000000
2	0.346800	6.337614	9.989324	83.58851	0.077765	0.006790
3	0.462867	5.182487	9.996380	84.64173	0.046978	0.132426
4	0.547565	4.274884	10.31437	85.12609	0.177792	0.106865
5	0.618573	3.388143	9.801560	85.80464	0.911678	0.093983
6	0.678097	2.822604	9.279165	85.94361	1.870303	0.084322
7	0.737232	2.399852	8.784884	85.85683	2.871717	0.086718
8	0.799655	2.040253	8.523890	85.76353	3.562249	0.110072
9	0.871891	1.748549	8.468310	85.71782	3.903246	0.162075
10	0.955983	1.553433	8.606536	85.62406	3.982091	0.233883
Panel DROE						
Period	S.E.	LSR	LMVA	LROA	LROE	LEVA
1	0.329704	0.385775	3.016803	70.98522	25.61220	0.000000
2	0.500371	3.517751	9.543833	72.11484	14.76559	0.057988
3	0.619226	3.669151	11.00937	74.11208	11.16883	0.040563
4	0.700237	2.895436	10.73918	77.45996	8.809661	0.095769
5	0.748308	2.690700	10.27378	78.84294	7.976204	0.216369
6	0.784226	2.931256	9.665199	79.04089	8.049116	0.313540
7	0.815510	3.095672	9.184293	78.95295	8.405197	0.361886
8	0.848272	2.967570	8.905801	79.20943	8.564393	0.352801
9	0.889020	2.701954	8.892561	79.75201	8.332276	0.321203
10	0.942237	2.476127	9.122260	80.30434	7.800732	0.296539
Panel E: EVA						
Period	S.E.	LSR	LMVA	LROA	LROE	LEVA
1	1.339928	0.040068	0.056407	38.14889	0.572631	61.18201
2	1.842358	7.126752	1.958113	22.35312	18.86062	49.70140
3	1.969964	6.471015	2.056345	21.31621	18.59412	51.56232
4	2.136867	5.577268	2.312081	20.18711	20.44022	51.48332
5	2.319104	4.736785	2.583471	23.84955	20.62757	48.20262
6	2.449729	4.258402	3.082448	26.77735	20.00127	45.88053
7	2.559263	3.924607	3.259791	29.98254	18.99351	43.83956
8	2.645946	3.767822	3.334059	32.79779	17.97716	42.12316
9	2.723376	3.687246	3.360948	35.42666	17.00157	40.52357
10	2.801288	3.577566	3.408319	38.08238	16.07071	38.86102
Cholesky Ordering: LSR LMVA LROA LROE LEVA						

4. Study Implications

This study has extended the level of acceptability of the combination of both the accounting-based variables and value-based management variables as a better means of evaluating corporate performance and as leverage to settle the superiority argument between the two approaches. This study clears the ongoing argument in the literature regarding the superiority between accounting variables and the VBM approach. Findings from this study revealed that both approaches are good measures of corporate performance but that the accounting approach provides more incremental information than the value-based approach. This is inconsistent with the result from [Maditinos et al. \(2009\)](#). Moreover, this result depends on the type of performance measured, as for firm value-related performance, the VBM approach is better ([Kumar and Subramanyam 2017](#)), but for detailed company financial performance, the accounting approach is better. Therefore, a combination of both approaches better evaluates the general performance of companies. This was demonstrated by the findings from this study, which revealed that accounting and VBM variables (ROA, ROE, and EVA) exhibited a positive and significant relationship with shareholder return as a measure of performance ([Al-Qudah 2016](#)). In more detail, the

positive and significant relationship between ROA and shareholder returns implies that an increase in the return on assets signifies a rise in the profitability of firms. An increase in a company's asset base implies chances of expanding production capacity and, thereby, transforms into greater sales revenue that can bring about better performance. This would trigger a greater demand for the shares of the aforementioned companies amongst existing and potential investors, thereby enhancing company performance, value, and shareholder wealth. It also indicates that a rise in return on assets creates additional opportunities for selected firms in South Africa to expand their profitability framework and attract more investors, resulting in increased company sustainability and performance. This conclusion is consistent with the empirical findings of [Al-Qudah \(2016\)](#), [Parhusip et al. \(2019\)](#), [Sukmawati and Garsela \(2016\)](#), and [Supriyadi \(2021\)](#) in their respective studies. Similarly, the result from returns on equity is positively and statistically significant for both techniques. This finding emphasises that elevating the returns on equity improves the profitability ratio of the aforementioned companies' equity shareholders. This motivates the existing shareholders and more potential investors to purchase their shares, considering their future profitability and value, and, thus, increases the company's performance and sustainability. This outcome aligns with the empirical results of [Pakpahan \(2010\)](#), and [Kuswanto and Taufiq \(2010\)](#), who reached similar conclusions. The results from economic value added are positively and statistically significant across models. This implies that the rise in the economic value added of the considered firms serves as a barometer for potential investors, leading to an increase in the company and sustainability performance of the selected South African firms. This outcome also highlights that increasing the economic market value of the firms considered not only enhances shareholder wealth but also improves their market image, which, thus, increases company sustainability and performance in the long run. This finding is supported by [Gupta and Sikarwar \(2016\)](#), [Al-Awawdeh and Al-Sakini \(2018\)](#), and [Basana et al. \(2020\)](#) in their investigations. On the other hand, the estimated coefficients of market value added are negative but statistically insignificant. By implication, many VBM variables do not evaluate performance as the accounting variables do.

Further empirical study revealed that there exists a bidirectional causality between returns on assets and shareholder returns, which implies feedback between the variables. By implication, this revealed that ROA is an important metric for measuring the performance of a company. Therefore, the asset base of a company determines its level of performance and value to be created for its shareholders. This result suggests that returns for shareholders are influenced by returns on assets. Alternatively, the increase in returns on assets of the considered companies enhances the performance of companies. This then implies that companies with strong asset bases are likely to grow faster through diversification, create more value, and sustain the value created. Companies that are strongly asset-based can grow in competition with the leaders in the industry they belong to. A firm's continuous growth in ROA can accelerate its diversification, allowing it to become a multi-national corporation and enjoy cross-listing on the international stock exchange. This further implies that a company with continuous growth in ROA would not only create value and attract potential investors but also be sustainable. These causality outcomes further show that there exists a unidirectional causality from market value added to shareholder returns; shareholder returns to economic value added; market value added to return on asset; market value added to return on equity; returns on asset to return on equity; and returns on asset to economic value added, respectively. These findings suggest that improvements in market value added can increase shareholder returns, returns on assets, and returns on equity. It further implies that the market in which companies belong is also important as this would determine sales revenue in terms of turnover. This can transform into value creation and later lead to value sustainability. On the other hand, the market value of a company is very important because this is associated with the company's share price performance on the stock exchange and the determination of the prevailing market price amongst other competitors. Thus, any shock from such a company's stock market would definitely affect its overall performance. Similarly, these outcomes show that increasing

economic value added can be influenced by shareholder returns, and this study also discovered that rising returns on assets increase returns on equity and economic value added (Babatunde and Evuebie 2017). The results also show that increasing returns on equity can stimulate economic value added. However, the findings show that there is no bidirectional causality from shareholder returns to market value added; economic value added to shareholder returns; returns on assets to market value added; returns on equity to market value added; economic value added to market value added; market value added to economic value added; return on assets to returns on equity; economic value added to returns on assets; and economic value added to return on equity, respectively.

5. Conclusions, Limitations, and Suggestions for Further Studies

This study clears the ongoing argument in the literature regarding the superiority between accounting variables and the VBM approach by confirming the level of relationship that exists between accounting variables, VBM variables, and company performance. The findings from this study's results revealed that both approaches are good measures of corporate performance but that the accounting approach provides more incremental information than the value-based approach. However, this depends on the type of performance measure used. For a firm's value-related performance, the VBM approach could be better, but for details and other specific company performance, the accounting approach is better. Therefore, a combination of both approaches better evaluates the general performance of companies. To achieve the above, this study evaluated the causal relationship between the accounting model, VBM model, and shareholder return. This study explored the causality test as well as variance decomposition to test the level of variability amongst the variables and how sensitive they are to one another by considering the shock from each variable. This study further empirically employed the fully modified ordinary least squares (FMOLS) and dynamic ordinary least squares (DOLS) techniques to justify its results. Overall, the findings from the causality test revealed a unidirectional relationship between economic value added and market value added, with only unidirectional causality from shareholder returns to market value added; economic value added to shareholder returns; returns on assets to market value added; returns on equity to market value added; economic value added to market value added; market value added to economic value added; return on equity to return on assets; economic value added to return on asset; and economic value added to return on equity. However, a very strong bidirectional causality relationship was found between return on asset and shareholder return as a measure of company performance. These findings suggest that both accounting variables and VBM variables maintain good relationships with shareholder returns as a measure of firm performance. Further results from the forecast error of the variance decomposition show that shareholder returns are explained only by its own shock, contributing 45.38 percent in the long run, while the remaining variables, market value added, return on asset, return on equity, and economic value added, contribute about 35.96%, 14.06%, 4.08%, and 0.51%, respectively, to predicting the future values of shareholder returns. This confirms that there exists a relationship amongst the variables from the short run to the long run and also that both variables contribute to performance and that accounting variables provide more information than VBM variables. This suggests that shocks to a company's assets (ROA) could deprive the company of its assets to the tune of 14%, 17%, 86%, 80%, and 38%, respectively. This finding is a serious threat to the sustainability of any organisation and could lead to divestments by investors, who are the real owners of the company. Lastly, the results from FMOL and DOL revealed that all accounting and VBM variables are good approaches for evaluating company performance. This was affirmed by the empirical result on ROA, ROE, and EVA, which revealed positive and significant results. This confirms that a combination of both types of variables would produce a better evaluation. Conclusively, the study has confirmed the following: firstly, there exist relationships between accounting variables and VBM variables, accounting variables provide more incremental information about performance than VBM variables, and it would be better for companies' managers

to combine both variables for a better evaluation of their companies' performances. This study is an insight for companies' management and boards of directors in order to guide them as to the proper and better ways to evaluate company performance. Consequently, it is recommended that managers select combinations of accounting and VBM variables that suit their operations and jointly apply them in the performance evaluation of the company. This will be useful in providing both the relative and incremental performance information needed for various decision-making endeavours. The study also looked at which of these variables could explain the value creation of the industry collectively. However, this study was limited to industrial companies on the JSE. Further studies are recommended that use the data of companies from other sectors. Furthermore, this study focused on South African companies due to country-specific risks associated with companies and different economies. For these reasons, further studies are recommended that consider companies from other countries to see if results will prove similar. It is also recommended that other statistical techniques be applied other than the ones applied in this study.

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Note

- ¹ Adcorp; Afrimat; ARB; Argent; Aveng; Barworld; Bell; Bowcalf; Cafca; Calgro; CSG; Ellies; Enxgroup; Grindrod; Hudaco; Imperial; Invicta; KAP; Labat; Marshall; Mastdrill; Metrofile; Mixtell; Mpact; M&H; Nampak; Net1; Novus; Onelogic; PPC; Primeserv; Raubex; Reunert; Santova; Sephaku; S.ocean; Stefstock; Supgrgp; Bidvest; Trnpaco; Trencor; Wbho; Workforce.

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