“Predictive power of economic-based performance indicators on shareholder value: Evidence from South African listed firms”

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PREDICTIVE POWER OF ECONOMIC-BASED PERFORMANCE INDICATORS ON SHAREHOLDER VALUE: EVIDENCE FROM SOUTH AFRICAN LISTED FIRMS

Abstract

Financial statements are often number intensive, and determining the importance and relevance of these numbers from the perspective of investors and equity holders is paramount. However, empirical studies concerning the correlation between several accounting and economic-based indicators with shareholder returns have yielded contradictory results. Additionally, considering the relatively limited studies on economic-based indicators such as refined economic value-added and economic value-added momentum, this study evaluated the predictive power of refined economic value added, economic value-added momentum, and economic value added (economic-based indicators), along with traditional accounting-based indicators such as return on equity and earnings per share on the shareholders' returns. The study employed fixed-effect instrumental variable regression and panel quantile regression techniques to examine 49 non-financial companies listed on the Johannesburg Stock Exchange from 2007 to 2021. Overall, the results showed that economic value added is a significant negative predictor of shareholder returns, while refined economic value-added is a positive determinant. In addition, the refined economic value-added coefficient remains positive, with the impact increasing across the conditional quantiles. This study concludes that refined economic value-added provides a superior and realistic determinant of shareholder value on the Johannesburg Stock Exchange compared to other measures.

Keywords economic-based indicators, accounting-based indicators, return on equity, earnings per share, predictability, shareholder returns

JEL Classification G11, G14, G30, G34

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INTRODUCTION

In today's competitive world, which is characterized by resource scarcity, maximizing shareholder wealth is the ultimate objective of corporate managers. Shareholder wealth measurement can either be in the form of dividends received or in the form of capital appreciation, or both. Hence investors require a forward-looking construct that accurately assesses a company's performance and is associated with the market price of a share.

Traditional accounting-based indicators (ABI), such as earnings per share (EPS), return on equity (ROE) and return on assets (ROA), are used by shareholders to assess investment performance. However, these constructs have been criticized because they do not consider the total cost of capital, which consists of the cost of debt and equity (Panigrahi et al., 2014). Therefore, to address the ABI's shortcomings, economic-based indicators (EBI) such as economic value added (EVA),

refined economic-valued added (REVA), and economic value-added momentum (EVAM), which incorporate the total cost of capital have been advocated (Stewart,1994; Bacidore et al., 1997; Stewart, 2009).

Several studies concerning the association of ABI and EBI with shareholder returns have been undertaken on the global capital markets; however, these exercises yielded different results. Additionally, to the authors' knowledge, ABI and EVA relationship with shareholder returns has been extensively tested globally; from the Johannesburg Stock Exchange-listed companies' perspective, constructs such as REVA and EVAM are not tested. Therefore, there is an incentive to examine the explanatory power of REVA and EVAM on shareholder return alongside EVA, EPS, and ROE simultaneously for the first time on the largest African stock exchange.

1. LITERATURE REVIEW

The equity market literature in the last five decades is characterized by a search for an indicator used for company performance evaluation that is correlated to stock price, considering that stock price affects shareholders' return. For instance, Ball and Brown (1968) conducted the first test on the value relevance of ABI in the United States, and Stern Stewart Company reintroduced EVA in the 1980s after being advanced by General Motors in 1920. Building upon Ball and Brown's (1968) seminal work, Nichols and Wahlen (2004) studied the correlation between annual stock returns and annual earnings on the New York Stock Exchange (NYSE), American Express Company (AMEX), and National Association of Securities Dealers Automated Quotations (NASDAQ) firms. Based on 31,923 firm-year observations from 1988 to 2001, the descriptive statistical test indicates a significant correlation.

Additionally, studies using several accounting constructs, different methodologies, such as ordinary least square (OLS), pooled least squares (Pols), random effect model (RE), fixed effect model (FE) and a combination of univariable and multivariable regression models, were undertaken.

From an ABI perspective, several studies have yielded a positive association with stock prices. For example, based on a sample of the top 30 firms of the Financial Times Stock Exchange (FTSE)-100 index of the London Stock Exchange from 2005 to 2014 and using a panel regression analysis, Anwaar (2016) found that net profit margin and ROA have a significant positive correlation with stock returns, while EPS negatively impacts stock returns; however, ROE and quick liquidity ratio do not exert any impact on stock returns.

Using a panel regression analysis, Aveh and Vitor (2017) examine the relationship between EPS, ROE, book value market, dividend per share, dividend yield, leverage capitalization and stock price. The results indicate that ABI, namely EPS, ROE, book value and the value-based measures (market capitalisation), are correlated to stock prices. Additionally, based on multiple regression analysis, Menaje (2012) found a strong and positive correlation between EPS and share price, i.e., the model explained 73% of the stock price variation in the Philippine Stock Exchange.

In contrast, a negative and no association has been reported. For example, Badruzaman (2020) found that ROE is negatively and significantly correlated with the stock price, based on 57 companies listed on the Nikkei 225 index, thus meaning an adverse impact of ROE on stock prices. Additionally, Hamidah 2015, based on the F-test and t-test, found that ROE negatively correlates with shareholder wealth, while return on capital employed (ROCE) and EPS are positively associated with shareholder wealth in the context of the Indonesian bank industry. On the other hand, a recent study by Sulistyanie and Sumantri (2020) informs that stock prices are not statistically significantly responsive to the debt-equity ratio and ROE on the Indonesian Stock Exchange based on the FE model data.

Additionally, from the JSE stock market outlook, empirical evidence indicates mixed outcomes; for example, De Villiers et al. (2003), Erasmus (2010), and Robbetze et al. (2017) found that EPS is positively correlated with the stock price of the JSE listed companies, while De Wet and Du Toit (2007) and Vermeulen (2016) state that EPS and ROE are not correlated with shareholders return on the JSE.

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From the EBI perspective, in particular, EVA, where the total cost of capital is at book value, several scholars have tested Stewart's (1994) claim in various stock markets, and the results indicate that ABI outclasses EVA in explaining stock returns. For instance, Sharma and Kumar (2010) studied the Indian manufacturing sector (2000–2007) and found that net operating profit after tax (NOPAT) and operating cash flow (OCF) are better than EVA in describing MVA. Using a sample of 566 US companies from 1986 to 1992, Chen and Dodd (1996) point out that EVA explains only 20% of the inconsistency of stock returns, while ROA can explain 24.5%. However, in a study by Babatunde and Evuebie (2017) based on 60 companies listed on the Nigerian Stock Exchange from 2004 to 2015, the OLS regression model outcome reveals a significant positive correlation between EVA and stock return.

In the JSE context, Magwegwe (2003) found that the EVA metric is not correlated with the share price of JSE-listed companies. Similarly, Sauro and Tafirei (2016), based on multiple regression analysis and the OLS method, found that EVA is relatively weak compared to EPS, dividend per share (DPS), and marginal revenue in commercial banks. In contrast, still from the JSE standing point, Weldon (2013) found that the coefficient correlation R^2 of EVA was positive and statistically correlated with the share price (2000–2010). However, De Wet (2004) tested 89 listed companies from 1995 to 2004 and concluded that ABI has a better positive correlation with MVA than EVA spread.

From the REVA proposition, the total cost of capital is at market value; hence the capital charge does reflect the opportunity cost for investors because if investors sell a firm for its market value and apply the proceeds to assets of identical risk profiles, they could expect to earn a return equal to the weighted average cost of capital (WACC) on the overall market value of the firm, and not only on the book value of the investment of the firm shown in the balance sheet (Richter & Honold, 2000). The critical advantage of REVA relative to EVA, according to its proponents Bacidore et al. (1997), is that incremental shareholder value has been created whenever REVA is positive, that is, the operating income flowing to shareholders at the end of the period as a percentage of their investments' market value at the beginning of the period exceeds their opportunity cost of capital. However, this condition is not always the case for EVA; from the EVA proposition, shareholders could be getting an operating-income-based return below their opportunity cost of capital, even when EVA is positive. Based on this scenario, Pourali and Roze (2013) state that REVA emphasizes the value relevance of information instead of its reliability embodied in book value.

Unlike ABI and EVA, there are relatively few studies on REVA; nevertheless, the dearth of articles yielded mixed results. The first study on the REVA conducted by its proponents, Bacidore et al. (1997), in the United States (1982–1992), reveals that REVA is superior to EVA. Baseri et al. (2013) also showed that REVA, EVA, and OCF significantly and positively correlated with future OP in 56 companies listed on the Tehran Stock Exchange (1996–2008). In the same exchange, Pourali and Roze (2013), based on 67 companies (2006–2010), indicate that ROA and REVA were the most significantly and positively correlated with market value added (MVA) compared to ROE and EPS, EVA. Furthermore, Quintiliani (2018) conducted a similar test with 75 Alternative Investment Market (AIM) companies in Italy (2010–2015) and indicated that REVA correlates more with MVA than EVA. In addition, Nugroho (2018), using 104 manufacturing companies listed on the Indonesian Stock Exchange (2014–2016), reveals that EVA, MVA, and REVA substantially correlate with stock prices and return.

In contrast, other empirical studies failed to attest to REVA supremacy over other constructs. For instance, Arabsalehi and Mahmoodi (2012) report that ABI, namely ROE and ROA, are better predictors of company stock prices than the four value-based metrics (EVA, REVA, MVA, and SVA). Nakhaei et al. (2016) in Bursa Malaysia (2002–2011) refute the REVA supremacy compared to other ABI for explaining stock returns. Similarly, Ashraf (2018) later revealed that EVA outperformed REVA.

Using EVAM constructs, Mahoney (2011) studied lodging and fixed-asset-intensive companies in the United States (2001–2008). No difference

was found between the EVAM for the lodging and restaurant industries. Nakhaei et al. (2012) measured the correlation between EBI and the MVA in Bursa Malaysia (2001–2010), and no evidence supporting that EVA, REVA, and EVAM positively correlated with MVA was reported. Additionally, Fayed and Dubey (2016) focused on 43 listed companies in the United Arab Emirates (2008–2013) and revealed that EVAM, EVA margin, did not provide incremental information content as the price-to-book value multiple and net-book values; similarly, Wirawan (2011) claims that EVAM fails to explain futures prices. Moreover, Aziz (2011) indicates a negative relationship between EVAM and the total real estate ratio over gross tangible assets in Stockholm Stock Exchange-listed companies (2006–2009).

On the other hand, some empirical evidence attested to EVA Dimension's claim. For instance, in a study concerning the association between EVAM and market stock prices, Maeenuddina et al. (2020) found a positive and substantial correlation between EVAM and the working capital management of 69 non-financial companies listed on the Pakistan Stock Exchange (2007–2017). Additionally, Omneya et al. (2021) studied the explanatory power of EVA and EVAM on ROE and ROA in the Egyptian stock exchange (2010–2019), revealing that EVAM explains ROA and ROE; however, EVA did not.

Empirical evidence has also shown different outcomes from the relative information content between ABI, EBI, and stock price behavior. For instance, Arabsalehi and Mahmoodi (2012), using a pooling panel data method, examine the correlation between several ABI (EPS, ROE, ROA, and return on sales), EBI (EVA. REVA, MVA, shareholders value added) and stock returns. The outcome of 115 Iranian listed companies between 2001 and 2008 reveals that ROE and ROA are relatively superior to other constructs. However, in a recent study by Rasool et al. (2021), based on 107 listed companies on the Pakistan Stock Exchange, the panel OLS regression technique reveals that the EBI (EVA, EVAM and EVA spread) are superior to ABI (ROE, EPS, ROA, and ROCE) during 2011–2018. Gupta and Sikarwar (2016) reported similar findings.

In summary, no conclusive evidence supports EVA's explanatory power of shareholder returns relative to ABI. On the other hand, EVA's equity valuation at book value is not aligned with shareholders standing point because the shareholder return is a function of the stock price differential between two periods plus dividends. Therefore, with the equity valuation based on the market price, REVA is more relevant for equity holders; consequently, REVA should impact stock price. Regarding EVAM, despite being based on EVA, EVAM attributes provide valuable insights into a company's economic profit variation between two consecutive periods.

2. AIM AND HYPOTHESIS

Based on the literature review, the theoretical superiority and the value relevance of REVA and EVAM have not been tested on the JSE. Therefore, this study's purpose is to examine the positive explanatory power of EBI (REVA and EVAM EVA) and ABI (EPS and ROE) on shareholder returns on the JSE. The null hypothesis is given as follows:

Hoi: EVA, REVA, EVAM, ROE, and EPS do not have a significant positive explanatory power on shareholder returns on the JSE-listed firms.

3. METHODS

3.1. Sample and data source

The sampling technique in this study was purposive sampling. Following previous related studies (Amyulianthy & Ritonga, 2016; Ejaz et al., 2018) and practice, real estate companies, banks, financial institutions, unit trusts, and companies whose financial statements were unavailable for 2007–2021 were excluded. From an initial sample of 164 companies listed on the JSE ALSI, the final sample amounted to 49 listed companies.

To determine the EBIs (EVA, REVA, and EVAM), it is required to adjust the accounting profit. However, according to Anderson et al. (2004), there is no theory that guides the selection of the most relevant items to be adjusted. Therefore, the adjustment exercise was undertaken in line with Stewart's (1991) recom-

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mended adjustments and consisted of the (i) adjustment to the accounting profit; (ii) computation of the invested capital (IC); (iii) determination of the total WACC (Jakub et al., 2015). Consequently, the EBI input variables, namely, NOPAT, IC, cost of debt, cost of equity, and dependent variable input factors such as share price and dividend per share, were obtained from Integrated Real-Time Equity System (IRESS) (former INET-BFA) data source. The IRESS database was also used by De Wet and Du Toit (2007), Du Toit (2015), and Erasmus (2008, 2010) in studies that required financial information of JSE-listed companies.

3.2. Operational variables and measurements

The study identifies the dependent variable as shareholders' return (ShR); the independent variables are the ABIs (EPS and ROE), EBIs (EVA, REVA, and EVAM), while total assets and revenue are the control variable. According to Ahsan (2012), the ROE links the statement of comprehensive income (NOPAT) and the statement of financial position component (average shareholder equity); therefore, it is highly regarded by investors and can be expressed as a ratio of the two. EPS was calculated as the ratio of net income after preferred stock dividends. EVA and REVA, according to Stewart (1991) and Bacidore et al. (1997), respectively, are defined as the difference between a company's NOPAT and its total cost of capital (cost of debt and cost of equity) and can be expressed as:

$$EVA; REVA = Adjusted\ NOPAT - -(IC \cdot WACC). \quad (1)$$

Adjusted NOPAT measures company profit from its ongoing operations adjusted from GAAP distortions to convert the accounting profit into economic profit. *IC* is the operating capital employed; it is defined as interest-bearing debt and equity at the beginning of the period, and *WACC* is the weighted average cost of capital. The difference between *EVA* and *REVA* arises from the equity valuation approach as the *EVA* uses equity valuation based on historical or book value, *REVA* is based on the market stock price. Therefore, the *REVA* proposition is aligned with the shareholder's value creation. Eva Dimension (2009) quantifies *EVA* growth or deterioration over time and can be expressed as follows (Stewart, 2009).

$$EVAM = (EVA_1 - EVA_0) / Sales_0. \quad (2)$$

EVA_1 is the *EVA* in the current period, EVA_0 is the *EVA* in the prior period (t_n – 1), and $Sales_0$ is the revenue for the preceding period (t_n – 1). This study used natural logarithms of total assets and total revenues as control variables following related studies (Hung et al., 2019; El-Habashy, 2019). Shareholder value creation should be measured in terms of total *ShR*, which consists of capital gains/losses plus the dividends received (Tawiah & Benjamin, 2015), which can be expressed as follows:

$$ShR = (P_1 - P_0 + D) / P_0, \quad (3)$$

where P_1 is the stock price at year-end, P_0 is the share price at the beginning of the year, and D represents the dividend per share paid in the current year – this variable is expressed as a percentage.

3.3. Model specification and estimation techniques

Panel data (longitudinal data) regression analysis is paramount to establish the dimension of the relationship over several periods between the study's independent and dependent variables (Tan et al., 2021). Therefore, this study uses Driscoll and Kraay's (1998) robust standard-error method incorporated into the fixed-effect instrumental variable (FE-IV) regression model. The multivariable regression model below presents shareholder returns as a function of accounting- and economic-based explanatory variables and control variables hence:

$$ShR_{it} = f\begin{pmatrix} Accounting_{it}, \\ Economic_{it}, \\ Control_{it} \end{pmatrix}, \quad (4)$$

$$\begin{aligned} SR_{it} &= \alpha_i + \beta EPS_{i,t} + \beta ROE_{i,t} + \\ &+ \beta(EVA_{i,t} / MVE_{i,t-1}) + \\ &+ \beta(REVA_{i,t} / MVE_{i,t-1}) + \\ &+ \beta(EVAM_{i,t}) + \beta\left(\ln Total\ Assets_{it}\right) + \\ &+ \beta\left(\ln Revenue_{it}\right) + \gamma_t + \varepsilon_{i,t}, \end{aligned} \quad (5)$$

where α_i is the constant, γ_t is the time-invariant company-specific effect, and $\varepsilon_{i,t}$ is the error term, β is the elasticity of the explanatory variables.

This study further used a quantile regression technique to examine the varied and distributional effects at different levels of shareholder returns. Machado and Silva's (2019) conditional quantiles' estimation $Q_y(\tau|X)$ is given as:

$$Y_{i,t} = \alpha_i + X_{i,t}\beta + \left(\delta_i + Z_{it}\gamma\right)U_{i,t}. \quad (6)$$

The parameters to be estimated are the probability: $P\{\delta_i + Z_{it}\} > 0 = 1$. $(\alpha, \beta, \delta, \gamma)$, $(\alpha i, \delta i)$, i takes the value 1 to n, representing the company's i fixed effect.

4. RESULTS

Table 1 presents the coefficients of correlation of EPS, ROE, EVA, REVA, and EVAM used in this study from 2007 to 2017. For instance, the results indicate a positive and strong correlation between EPS, total assets, total revenue, and shareholder returns. However, a strong and negative relationship was observed between ROE, EVA, REVA, EVAM, and shareholder returns. The correlation outcomes indicate no potential multicollinearity as the values are not higher than 0.80.

Table 2 presents the fixed effect and instrumental regression results of the determinants of shareholder return on the JSE-listed companies. Through EVA, shareholders are informed of the value managers have added or destroyed to the company (Alam & Nizamuddin, 2012). The empirical results indicate that an increase of one per cent on EVA leads to a decrease in shareholder returns by 0,76%. This outcome suggests that NOPAT was not large enough to cover the total capital charge. Therefore, shareholder returns may be negatively affected as a company fails to meet the expected return on investment. The coefficient of REVA indicates that it has a positive and statistical impact on shareholder returns such that if REVA increases by one per cent, shareholder return increases by 0.02%. This suggests that REVA is a more appropriate predictor of shareholder value on the JSE. REVA's relevance is aligned with the theoretical stance because it is based on the market stock price and aligned with the shareholder's value creation.

The outcome indicates a positive relationship between EVAM and shareholder returns, which suggests that EVAM effectively captures the value creation trend of a company. A positive EVAM implies that a company is consistently creating value by generating returns above its cost of capital. EVAM does not exert a significant impact on shareholder returns. Therefore, in the JSE context, the findings failed to support Eva Dimensions (2009) and Stewart's (2009) claim of EVAM superiority in explaining stock prices. The empirical results indicate that EPS negatively correlates with shareholder returns. Consequently, EPS explains shareholder returns on the JSE significantly. The coefficient of ROE indicates that it has a positive but insignificant impact on shareholder returns on the JSE.

Table 1. Correlation matrix

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) EPS	1.000							
(2) ROE	0.121	1.000						
	(0.001)							
(3) SR	0.070	−0.007	1.000					
	(0.052)	(0.648)						
(4) EVA	0.035	0.079	−0.139	1.000				
	(0.344)	(0.033)	(0.000)					
(5) REVA	−0.004	0.026	−0.023	0.237	1.000			
	(0.911)	(0.476)	(0.537)	(0.000)				
(6) EVAM	0.082	0.091	−0.026	0.096	0.053	1.000		
	(0.021)	(0.011)	(0.459)	(0.009)	(0.150)			
(7) T. Assets	0.309	−0.060	0.373	−0.343	−0.073	−0.015	1.000	
	(0.000)	(0.094)	(0.000)	(0.000)	(0.049)	(0.678)		
(8) T. Revenue	0.330	0.050	0.217	−0.191	−0.041	0.005	0.801	1.000
	(0.000)	(0.159)	(0.000)	(0.000)	(0.270)	(0.681)	(0.000)	

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

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Table 2. Determinants of shareholder returns

VARIABLES	(3)	(1)	(2)	(4)
	POLS	FE	RE	FE–IV
EPS	0.00163	4.84e+05	0.00122	–0.00965**
	(0.00202)	(0.00232)	(0.00196)	(0.00465)
ROE	–0.000820	–0.000589	–0.000558	0.000498
	(0.00133)	(0.00181)	(0.00152)	(0.00226)
EVA	–0.691***	–0.771***	–0.712***	–0.756***
	(0.0618)	(0.0824)	(0.0619)	(0.122)
REVA	0.0370***	0.0204*	0.0332***	0.0203*
	(0.00789)	(0.0104)	(0.00712)	(0.0187)
EVAM	0.364	0.450	0.379	0.588*
	(0.278)	(0.360)	(0.297)	(0.327)
Total Assets	–0.0369	–0.599***	–0.0845	–0.567***
	(0.0792)	(0.112)	(0.0906)	(0.206)
Total Revenue	–0.000924	0.424**	0.0394	0.462**
	(0.0632)	(0.167)	(0.0787)	(0.227)
Constant	–0.774	1.419	–0.653	0.354
	(0.868)	(2.760)	(1.075)	(2.089)
Hausman Test		54.65(0.005)		
Observations	453	453	453	453
R-squared	0.078	0.075	0.086	0.087
Number of firms	49	49	49	49

The distributional determinants of shareholders' return on the JSE are presented in Table 3 to determine how the impact of EVA, REVA, EVAM, total assets, and revenue differs across the conditional distribution of shareholder returns using the Machado and Silva (2019) approach. Table 3 shows that the EBIs retain their sign and significance; however, the magnitude of impact varies across levels. For example, the magnitude of EVA's negative impact depends on the quantile as the effect at the lower quantile (25th quartile) of shareholder returns (0.72%) reduces to 0.69% in the 50th quartile and 0.66% in the 75th quartile. Conversely, the positive impact of REVA at the lower quantile (25th quartile) of shareholder returns (0.036%) increases to 0.037% in the 50th quartile and 0.039%

Table 3. Distributional drivers of shareholder returns

VARIABLES	(1)	(2)	(3)	(4)	(5)
	Location	Scale	qtile_25	qtile_5	qtile_75
EPS	0.00163	–0.000129	0.00171	0.00161	0.00151
	(0.00375)	(0.00265)	(0.00468)	(0.00359)	(0.00352)
ROE	–0.000820	0.00174*	–0.00191	–0.000533	0.000753
	(0.00126)	(0.000892)	(0.00158)	(0.00121)	(0.00119)
EVA	–0.691***	0.0346	–0.713***	–0.686***	–0.660***
	(0.0946)	(0.0668)	(0.118)	(0.0906)	(0.0888)
REVA	0.0370*	0.00167	0.0359	0.0373**	0.0385**
	(0.0191)	(0.0135)	(0.0238)	(0.0183)	(0.0179)
EVAM	0.364	0.242	0.213	0.404	0.583
	(0.434)	(0.306)	(0.541)	(0.415)	(0.407)
Total Assets	–0.0369	0.155**	–0.134	–0.0114	0.103
	(0.0905)	(0.0639)	(0.113)	(0.0866)	(0.0851)
Total Revenue	–0.000924	–0.114*	0.0700	–0.0196	–0.104
	(0.0905)	(0.0639)	(0.113)	(0.0866)	(0.0850)
Constant	–0.774	0.136	–0.859	–0.751	–0.651
	(0.732)	(0.517)	(0.913)	(0.701)	(0.687)
Observations	453	453	453	453	453

Note: Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

in the 75th quartile. Similarly, the insignificant positive impact of EVAM at the lower quantile (25th quartile) of shareholder returns (0.21%) increases to 0.40% in the 50th quartile and 0.58% in the 75th quartile.

The ABIs' coefficients are not statistically significant. The results indicate that regardless of the distribution of shareholder returns, EPS positively and insignificantly impacts shareholder returns. However, coefficients indicate that the size of impact differs across quantiles as the lower quantile (25th quartile) (0.00171%) impact reduces to 0.00161% in the 50th quartile and 0.00151% in the 75th quartile. ROE's impact across the distribution of shareholder returns aligns with the fixed effect results presented in Table 2, but the impact the lower quantile (25th quartile) (–0.00191%) increases to –0.000533% in the 50th quartile and 0.000753% in the 75th quartile. Lastly, the impact of the control variables varies across quantiles, but they are not statistically significant.

Overall, the study rejects the null hypothesis which states that REVA does not have a significant positive explana-tory power on shareholder returns and accepts the null hypotheses that state that EVA, EVAM, EPS and ROE do not have a significant positive explanatory power for shareholder returns on the JSE.

5. DISCUSSION

Based on the findings, the EVA negative and statistically significant correlation with shareholder returns from the directional standing point contrasts Weldon (2013) and Babatunde and Evuebie (2017), who found a significant and positive correlation between EVA and stock price/return in Nigeria, and Magwegwe (2003) who found that the EVA metric is not correlated with the share price of JSE-listed companies. The findings, from the relative explanation power, are consistent with Gupta and Sikarwar (2016) who found that EVA is superior to ABI (EPS, ROA and ROE), but contradict Sauro and Tafirei (2016), who found that EVA is relatively weak compared to EPS, and DPS, in commercial banks.

This study outcome on REVA is aligned with previous studies such as Pourali and Roze (2013) on Tehran Stock Exchange; Quintiliani's (2018) findings in Italy. It is noteworthy that the positive statistical and significant impact of REVA provides support evidence to REVA proponents Bacidore et al. (1997). From the relative explanatory power, the current study informs that REVA is superior to EPS. Moreover, other empirical evidence attests to REVA supremacy (Bacidore et al., 1997; Pourali & Roze, 2013; Quintiliani, 2018; Nugroho, 2018). Therefore, in the JSE context, the findings failed to support EvaDimensions (2009) and Stewart's (2009) claim of EVAM's superiority in explaining stock prices. This contradicts Mahoney (2011), which indicates that EVAM fails to explain the future value in the United States, and Wirawan (2011) in Indonesia, where EVAM showed insignificant effects on stock returns; and Fayed and Dubey (2016) who reveals that EVAM and EVA did not offer greater relevant incremental information content in the United Arab Emirates than traditional ABI.

The EPS outcome supports the results reported by De Wet and Du Toit (2007), Erasmus (2010), and Robbetze et al. (2017) on the JSE. This study contradicts empirical evidence on other stock markets: Pourali and Roze (2013) and Sharma and Kumar (2011) for the Indian market, and Menaje (2012) for the Philippine Stock Exchange, who found that EPS was strongly correlated with stock prices. The ROE outcome supports previous studies on the JSE, such as De Wet and Du Toit (2007), who found that ROE was not a significant determinant of shareholder value. Similarly, Vermeulen (2016) found that the ROE and EPS did not significantly affect stock returns.

CONCLUSIONS

The purpose of this study is to examine the positive explanatory power of economic-based indicators (economic value added, refined economic-valued added, and economic value-added momentum) and accounting-based indicators (earnings per share and, return on equity), on shareholder returns on the Johannesburg Stock Exchange. The study concludes that economic value-added and refined econom-

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ic-valued added can be used to predict shareholder returns; however, the prediction signal is different. In other words, economic value-added negative correlation with shareholder returns means that an increase in economic value-added leads to a decrease in shareholder returns. In contrast, an increase in refined economic-valued added increases shareholders' returns. A positive economic value-added momentum implies that a company is consistently creating value by generating returns above its cost of capital. However, economic value-added momentum does not significantly impact shareholders' returns, casting doubt on its reliability.

Concerning the accounting-based indicators, it can be concluded that earnings per share cannot be used to predict shareholder returns on the Johannesburg Stock Exchange, despite its relative leverage arising from its compulsory disclosure in the financial report. Consequently, one may assume that the equity market negatively perceives the potential higher debt/equity ratio (De Wet 2013), which leads to higher earnings per share. Moreover, the return on equity "emphasizes" the negative market sentiment towards higher return on equity, which may arise from a company's higher level of debt. This study contributes to the literature by presenting the investors and analysts on the Johannesburg Stock Exchange with a measure of refined economic value added that overcomes the limitations of accounting metrics and economic value added in determining shareholder returns. This study presents the first evidence of refined economic value-added superiority in predicting shareholder returns relative to other metrics on the Johannesburg Stock Exchange.

AUTHOR CONTRIBUTIONS

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REFERENCES

1. Ahsan, A. F. M. (2012). Can ROE be used to predict portfolio performance? *Economics, Management, and Financial Markets, 7*(2), 132-148. Retrieved from https://ideas.repec.org/a/shc/jaresh/v5y2013i1p5-20.html
2. Alam, P., & Nizamuddin, M. (2012). Performance measures of shareholders wealth: An application of economic value added. *International Journal of Applied Financial Management Perspectives, 1*(1), 160-167. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2217307
3. Amyulianthy, R., & Ritonga, E.K. (2016). The effect of economic value added and earnings per share to stock return (panel data approach). *International Journal of Business and Management Invention, 5*(2), 8-15. Retrieved from https://www.ijbmi.org/papers/Vol(5)2/Version%20-3/B0520308015.pdf
4. Anderson, A. M. Bey, R. P., & Weaver, S. C. (2004). Economic value added adjustments: Much to do about nothing'. Paper Presented at *Midwest Finance Association Conference*, 18-20 March 2004. San Antonio, U.S.A.
5. Anwaar, M. (2016). Impact of firms' performance on stock return (Evidence from listed companies of FTSE-100 Index, London, UK). *Global Journal of Management and Business*

Research, 16(1), 1-10. https://globaljournals.org/GJMBR_Volume16/4-Impact-of-Firms-Performance.pdf

6. Arabsalehi, M., & Mahmoodi, I. (2012). The quest for superior performance measures. *International Journal of Economics and Finance, 4*(2), 116-126. https://doi.org/10.5539/ijef.v4n2p116
7. Ashraf, Y. (2018). Is REVA. a better predictor of shareholders' value? A study of Pakistan listed cement companies. *International Journal of Economics, 8*(2), 1-22. Retrieved from http://www.tjprc.org/publishpapers/2-41-1520656161-1.IJECRAPR20181.pdf
8. Aveh, F. K., & Vitor, D. A. (2017). Firm-specific determinants of stock prices in an emerging capital market: Evidence from Ghana Stock Exchange. *Cogent Economics & Finance, 5*(1), 1-12. https://doi.org/10.1080/23322039.2017.1339385
9. Aziz, T. (2011). *A new revolutionary ratio?* KTH, School of Architecture and the Built Environment (ABE), Real Estate and Construction Management, Banking and Finance. Retrieved from https://www.diva-portal.org/smash/record.jsf?pid=diva2%3A503704&dswid=8188
10. Babatunde, A. A., & Evuebie, O. C. (2017). The impact of Economic Value Added on stock return in Nigeria. *Scholars Journal of Economics, Business and Management, 4*(2), 89-93. Retrieved from https://www.sasspublishers.com/article/6645/
11. Bacidore, J. M., Bouquist, J. A., Milbourn, T. T., & Thakor, A. V. (1997). The search for the best financial measure. *Financial Analysts Journal, 53*(3), 11-20. http://dx.doi.org/10.2469/faj.v53.n3.2081
12. Badruzaman, J. (2020). The impact of earnings per share and return on equity on stock prices. *Systematic Review in Pharmacy, 11*(6), 1285-1289. Retrieved from https://www.sysrevpharm.org/articles/the-impact-of-earning-per-share-and-return-on-equity-on-stock-price.pdf
13. Ball, R., & Brown, P. (1968). An empirical evaluation of accounting income number. *Journal of Accounting Research, 6*(2), 159-178. https://doi.org/10.2307/2490232
14. Baseri, M., Atefat, M., & Baseri, S. (2013). 'EVA's and REVA's relative and growing information on benefits predictions in Tehran Stock Exchange accepted companies. *European Online Journal of Natural and Social Science, 2*(3), 401-408. Retrieved from https://european-science.com/eojnss/article/view/408
15. Chen, S. Dodd, J. L. (1996). Economic value added (EVA), I:A an empirical examination of a new corporate performance measure. *Journal of Management Issues, 9*(3), 318-333. Retrieved from https://www.proquest.com/docview/194164544
16. De Villiers, J. U., Hamman, W. D., Joubert, C., & Le Roux, N. J. (2003). Earnings per share and cash flow per share as determinants of share value; Tests of significance using bootstrap with Demestz's method. *Journal of Studies in Economics and Econometrics, 27*(1), 95-125. http://dx.doi.org/10.1080/10800379.2003.12106344
17. De Wet, J. H., & Du Toit, E. (2007). Return on equity: A popular, but a flawed measure of corporate financial performance. *South African Journal of Business Management, 38*(1), 59-69. http://dx.doi.org/10.4102/sajbm.v38i1.578
18. De Wet, J. H., & Hall, J. H. (2006). An analysis of strategic performance measures of companies listed on the JSE South Africa. *South African Journal of Economics and Management studies, 9*(1), 57-71. http://dx.doi.org/10.4102/sajems.v9i1.1157
19. De Wet, J. H. v. H. (2004). *A strategic approach in managing shareholders wealth for companies listed on the JSE Securities Exchange South Africa* (Doctoral thesis).University of Pretoria.
20. Driscoll, J. C, & Kraay, A. C. (1998). Consistent covariance matrix estimation with spatially dependent panel data. *Review of Economics and Statistics, 80*(4), 549-560. https://doi.org/10.1162/003465398557825
21. Du Toit, E. (2015). Revisiting the relationship between different financial risk measures and the market return on ordinary shares in South Africa. *South African Journal of Economic and Management Sciences, 18*(2), 218-231. http://dx.doi.org/10.17159/2222-3436/2015/v18n2a6
22. Ejaz, M., Tashfeen, R., Younas, K., & Naeem, A. (2018). Economic value added or earnings per share? An incremental analysis. *Empirical Economic Review, 1*(2), 63-90. Retrieved from https://ideas.repec.org/a/ris/empecr/0009.html
23. El-Habashy, H. (2019). The impact of accounting conservatism on corporate performance indicators in Egypt. *International Journal of Business and Management, 14*(10), 1-11. http://dx.doi.org/10.5539/ijbm.v14n10p1
24. Erasmus, P. D. (2008). Evaluating the information content of nominal and inflation-adjusted versions of the measure Economic Value Added. *Meditari Accounting Research, 16*(2), 69-87. https://doi.org/10.1108/10222529200800013
25. Fayed, A. M., & Dubey, S. (2016). An empirical study of the impact of EVA Momentum momentum on the shareholders value creation as compared to traditional financial performance measures – with special reference to the UAE. *International Journal of Economics and Finance, 8*(5), 23-38. https://doi.org/10.5539/ijef.v8n5p23
26. Gupta, V. K., & Sikarwar, E. (2016). Value creation of EVA and traditional accounting measures: Indian evidence. *International Journal of Productivity and Performance Management, 65*(4), 436-459. https://doi.org/10.1108/IJPPM-01-2014-0008
27. Hamidah, A. (2015). EVA, ROCE, ROE, and EPS as method of assessment of financial performance and its effect on shareholders' wealth: Evidence from bank listed at Indonesia

http://dx.doi.org/10.21511/imfi.20(3).2023.25

Stock Exchange 2011–2013. *International Journal of Scientific and Research Publication, 5*(2), 1-7. https://www.ijsrp.org/research-paper-0215/ijsrp-p3881.pdf

28. Hung, N. K., Tuan, G. O., Phuong, D. T. M., Thang, Le. D., & Hien, N. A. (2019). Key factors affecting the stock prices of enterprises listed on Ho Chi Min Stock Exchange. *Academy of Accounting and Financial Studies Journal, 23*(6), 1-7. Retrieved from https://www.abacademies.org/articles/Key-Factors-Affecting-the-Stock-Price-of-Enterprises-Listed-On-Ho-Chi-Minh-Stock-Exchange-1528-2635-23-6-494.pdf
29. Jakub, S., Viera, B., & Eva, K. (2015). Economic value added as a measurement tool of financial performance. *Procedia Economics and Finance, 26,* 484-489. https://doi.org/10.1016/S2212-5671(15)00877-1
30. Machado, J., & Silva, J. (2019). Quantiles via moments. *Journal of Econometric, 213*(1), 145-173. https://doi.org/10.1016/j.jeconom.2019.04.009
31. Maeenuddina, R. B., Hussain, A., Hafeez, M., Khan, M., & Wahi, N. (2020). Economic value added momentum & traditional profitability measures (ROA, ROE & ROCE): A comparative study. *Test Engineering and Management, 83,* 13762-13774. Retrieved from http://testmagzine.biz/index.php/testmagzine/article/view/6125
32. Magwegwe, N. N. (2003). *An empirical study into economic value added (EVA) as an indicator of share price in the South African context* (Master's Thesis). University of Natal.
33. Mahoney, R. (2011). *EVA momentum as a performance measure in the United States lodging industry* (Unpublished PhD Thesis). Iowa State University.
34. Menaje, P. (2012). Impact of the selected financial variable on the share price of publicly listed firms in the Philippines. *American International Journal of Contemporary Research, 2*(9), 98-104. Retrieved from http://aijcrnet.com/journals/Vol_2_No_9_September_2012/12.pdf
35. Nakhaei, H. N. (2016). Market value added and traditional criteria, which measure is a best predictor of stock return in Malaysian companies. *Iranian Journal of Management Studies, 9*(2), 433-455. https://doi.org/10.22059/ijms.2016.56413
36. Nakhaei, H. N., Hamid, NIN, Anuar, M. A., & Nakhaei, H. (2012). Performance evaluation using accounting variables (Net profit and Operating profit) and economic measures. *International Journal of e-Education, e-Business, e-Management and e-learning, 2*(161), 443-448. https://doi.org/10.7763/IJEEEE.2012.V12.161
37. Nichols, D., & Wahlen, J. (2004). How do earnings numbers relate to stock returns? A review of classic accounting research with updated evidence. *Accounting Horizons, 18*(4), 263-286. http://dx.doi.org/10.2308/acch.2004.18.4.263
38. Nugroho, M. (2018). The effect of economic value added (EVA), market value added (MVA), refined economic value added (REVA) on stock prices and return stock at manufacturing industries who listed on Indonesia Stock Exchange (BEI). *Archives of Business Research, 6*(12), 173-188. https://doi.org/10.14738/abr.612.5843
39. Omneya, A. K., Ashraf, S., & Eldin, B. B. (2021). Financial performance appraisal using economic value added in emerging markets: Evidence from Egyptian listed companies. *Open Journal of Social Science, 9*(3), 415-434. http://dx.doi.org/10.4236/jss.2021.93027
40. Panigrahi, S. K., Zainuddin, Y., & Azizan, A. (2014). Comparing traditional and economic performance measures for creating shareholder's value: Perspective from Malaysia. *International Journal of Academic Research in Accounting, Finance and Management Sciences, 4*(4), 280-289. Retrieved from https://ideas.repec.org/a/hur/ijaraf/v4y2014i4p280-289.html
41. Pourali, M. R., & Roze, Z. (2013). The relationship between market value added with refined economic value added and performance accounting criteria in the firms listed in the Tehran Stock Exchange. *International Research Journal of Applied and Basic Sciences, 4*(6), 1636-1645. Retrieved from https://scholar.google.com/scholar?hl=fa&as_sdt=0,5&cluster=6639994211261848689
42. Quintiliani, A. (2018). The relationship between market value added (MVA) of SMEs listed on AIM Italia and internal measure of value creation, the role of corporate strategy planning. *International Journal of Financial Research, 9*(1), 121-131. http://dx.doi.org/10.5430/ijfr.v9n1p121
43. Rasool, N., Ullah, S., Hussain, M. M., & Usman, M. (2021). The role of value added and conventional accounting measure in stimulating stock market returns: A study of non-financial sector listed at Pakistan Stock Exchange. *Journal of Accounting and Finance in Emerging Economies, 7*(1), 217-232. http://dx.doi.org/10.26710/jafeeV7i1.1599
44. Richter, F., & Honold, D. (2000). Das Schöne, das Unattractive und das Hässliche an EVA & Co [The beautiful, the unattractive and the ugly about EVA & Co]. *Finanz Betrieb – Zeitschrift für Unternehmensfinanzierung und Finanzmanagement, 2*(2), 265-274. (In German). Retrieved from https://www.econbiz.de/Record/das-sch%C3%B6ne-das-unattraktive-und-das-h%C3%A4ssliche-an-eva-co-richter-frank/10001486113
45. Robbetze, N., De Villiers, R., & Harmse, L. (2017). The effect of earnings per share categories on share price behaviour: Some South African evidence. *The Journal of Applied Business Research, 33*(1), 141-152. https://doi.org/10.19030/jabr.v33i1.9886
46. Sauro, M., & Tafirei, M. (2016) EVA and stock return: are they correlated? *Financial Assets and Investing, 7*(2), 34-51. https://doi.org/10.5817/FAI2016-2-3

47. Sharma, A. K., & Kumar, S. (2010). Economic value added (EVA) – Literature review and relevant issues. *International Journal of Economics and Finance, 2*(5), 3-5. https://doi.org/10.5539/ijef.v2n2p200

48. Stewart, G. B. (1991). *The quest for value. A guide for senior managers.* New York: Harper Business.

49. Stewart, G. B. (1994). EVA: Fact and fantasy. *Journal of Applied Corporate Finance, 7*(2), 71-84.

50. Stewart. B. (2009). EVA momentum: The one ratio that tells the whole story. *Journal of Applied Corporate Finance, 2*(2), 74-86. http://dx.doi.org/10.1111/j.1745-6622.2009.00228.x

51. Sulistyanie, A., & Sumantri, M. B. (2020). The effect of return on equity (ROE), debt equity ratio (DER) and earnings per share (EPS) the share price of LQ45 indexed companies on the Indonesia Stock Exchange for the period 2015–2018. *Technium, 2*(7), 209-221. Retrieved from https://techniumscience.com/index.php/technium/article/view/2029

52. Tan, B. T., Fam, P. S., Radin Firdaus, R. B., Tan, M. L., & Gunaratne, M. S. (2021). Impact of climate change on rice yield in Malaysia: A panel data analysis. *Agriculture, 11*(6). https://doi.org/10.3390/agriculture11060569

53. Tawiah, V. K., & Benjamin, M. (2015). The impact of board structure on shareholders return. *International Journal of Science and Research, 4*(3), 2310-2315. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2592916

54. Vermeulen, M. (2016). Fundamental factors influencing returns of shares on the Johannesburg Stock Exchange in South Africa. *Journal of Economic and Financial Sciences, 9*(2), 426-435. https://doi.org/10.4102/jef.v9i2.50

55. Weldon, S. G. (2013). The relationship between Economic value added and future accounting earnings: A study of South African listed companies. Paper Presented at the *Southern Africa Accounting Association Biennial Conference*, 26-28 June 2013. Somerset West, South Africa.

56. Wirawan, D. I. (2011). *Effects of EVA, EVA spread, EVA momentum and return on assets on stock return. Empirical study study in Indonesian Stock Market* (Unpublished doctoral thesis). Faculty of Economics and Business University Gadjah Mada, Indonesia.

http://dx.doi.org/10.21511/imfi.20(3).2023.25