“Economic value added: The best indicator for measuring value creation or just an illusion?”

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ECONOMIC VALUE ADDED: THE BEST INDICATOR FOR MEASURING VALUE CREATION OR JUST AN ILLUSION?

Abstract

Value creation has become a very important concept in finance. To this end, value creation metrics, like market value added and economic value added have raised the question of their superiority and ability to reflect the true value of organizations, as opposed to the classic accounting indicators like ROE, ROA and EPS. Nevertheless, EVA can only be calculated for listed companies, which makes it difficult to use this indicator to measure value creation for non-listed companies. In this way, some alternatives have been used such as the accounting beta to calculate the return on equity and subsequently the determination of the EVA. Within this framework, the central point of this research is to empirically verify the idea that the normal EVA and EVA calculated using accounting beta are the better measure than traditional indicators to explain MVA. A panel of 32 companies traded on the Casablanca Stock Exchange over the period 2015–2019 was selected for this study. The regression method on panel data was used. The results show that normal EVA is a superior metric than the classical indicators to explain MVA. In addition, the EVA calculated from the accounting beta could be used as a measure adapted to the case of unlisted companies to measure value creation.

Keywords accounting measures, EVA, accounting beta, market value added, cost of equity

JEL Classification C23, G32

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INTRODUCTION

The goal of every company is to maximize the wealth of its shareholders and other stakeholders to ensure its sustainability and sustainable growth. In today's fiercely competitive environment, the particular and growing demands of shareholder power drive companies to improve their performance while creating value. In this respect, value creation affects not only shareholders, but also stakeholders who need accurate and reliable financial information in order to collaborate with the organization. To this end, it is crucial to periodically measure the value created by a company in order to reasonably guarantee the profitability of the investments made in the company. In this context, there are many accounting and market measures to measure the creation of value for organizations, such as Tobin's Q, return on equity, return on assets, etc. (Al-Matari et al., 2014).

Nevertheless, with the traditional tools, "ROE, ROA, ROI ..." they have the disadvantage of ignoring the cost of equity used to earn their investment (Sharma & Kumar, 2012). This limitation has been addressed by devising new criteria for measuring value creation such as Economic Value Added and Market Value Added (Jakub et al., 2015). Regarding EVA, it is a trademark registered in 1989 by the American expert Stern Stewart, who supported the idea that EVA is the best al-

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ternative to measure value creation and internal performance of companies (Sharma & Kumar, 2012; Mamun & Mansor, 2012). Indeed, the exclusivity of EVA lies in its close link with market value (Lehn & Makhija, 1996), it allows one to give explanations of advantage on stock returns, to reduce the intensity of agency conflicts, since it aligns the objectives of owners with those of managers (Sharma & Kumar, 2012). Among other things, EVA can only be calculated for publicly traded companies, which hinders the use of this indicator to measure the value creation of non-publicly traded companies. To overcome this situation, alternatives have been used such as the use of accounting beta to identify the cost of capital and then the determination of EVA (Roque & Caicedo Carrero, 2021).

However, the empirical literature debates that measure between EVA and traditional indicators better explain market value creation "MVA". At this stage, previous research presents mixed results, depending on the research context and the methodologies used. Lehn and Makhija (1996), Milunovich and Tsuei (1996), Tan et al. (2011), Sharma and Kumar (2012), Nakhaei and Hamid (2013) found a positive and significant relationship of EVA with market value measured by MVA. While De Wet (2005), Altaf (2016), Shah (2020), Choong and Saravanan Muthaiyah (2021) found that there is a weak relationship between EVA and MVA.

In the presence of studies that present conflicting results, this research problem is as follows: To what extent can EVA be understood as the most comprehensive measure to reflect the market value creation of organizations?

1. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Although the concept of value creation is frequently used by both researchers and experts, there is no universal and agreed definition of the concept. This weakness has placed value creation in the field of thought of many researchers. However, the concept of value creation is not new, it existed long before financial experts popularized it in the 1990s. As a result, Frederick W. Taylor, the creator of the scientific organization of work, showed in the early 20th century that owners and workers must share the value created in an equitable manner (Des Horts, 2015). Indeed, Cappelletti and Khouatra (2004) defined the creation of the value of an organization as the performance of the quality of the mode of management carried out by the firm. These authors suggest that the creation of value is not an end in itself; it is a means of boosting the growth of the organization and of reinforcing its perenniality while seeking to have competitive advantages compared to other companies. Thus, Cherif and Dubreuille (2005) showed that the creation of value has a direct objective, which is the satisfaction of the expectations of various stakeholders. Al-Matari et al. (2014) confirmed that the primary objective of value creation exceeds the creation of wealth for shareholders but rather it is a means of communication to have important information for detecting strengths and weaknesses of an organization. On the other hand, Des Horts (2015) stated that the creation of value is the difference between the costs incurred to achieve an activity or a product.

Therefore, a central question arises, how to measure the creation of value? This question is crucial for every investor and manager. Through information on value creation, strategic decisions are implemented, as well as corrective actions to ensure the achievement of an organization's objectives. To this end, the indicators for measuring value creation have undergone an important transition in the history of finance to indicators that indicate much more the value created by firms. To this end, according to Jakub et al. (2015), after World War II, companies began to be interested in assessing the value of companies on the basis of Discounted Cash Flows (DCF). However, the DCF is the primary tool of analysis for evaluating projects, not for evaluating value creation and performance. This shortcoming has led to the implementation of new measures to enable investors to calculate the value creation of organizations, using ROA (Return on Assets), ROE (Return on Equity), ROS (Return on Sales), EPS (Earnings per Share), and others. The

purpose of these profitability measures is to provide a means of judging the degree of managerial accountability and a source of information that will ensure that managers are within budget and following guidelines. Nevertheless, given the change in modern economies marked by the fierce competition and opening of markets, many shortcomings and criticisms have been directed at these evaluation methods called traditional methods (Mamun & Mansor, 2012).

Indeed, the traditional tools for measuring value creation and performance have the privilege of being easy to calculate, but on the other hand, they are easy to be manipulated because they are influenced by some accounting rules and do not take into account the cost of capital (Sharma & Kumar, 2012; Anouar & Aasri, 2022). In addition, accounting measures of profitability neglect the notion of potential risks that may be incurred by a company, and the fact that managers have the ability to extract profits for their own benefit (Mamun & Mansor, 2012). Indeed, a firm with a high ROA cannot automatically claim that it creates value, as the returns do not cover the risk of investing in such an organization. A fund holder may invest the same amount of money in a firm that provides the same profitability but has a lower degree of risk compared to others.

To overcome the weaknesses of traditional indicators, new indicators of value creation have emerged, such as the EVA – Economic Value Added, and the MVA – Market Value Added (Jakub et al., 2015; Farabi & Bouazza, 2022). For EVA, it is an indicator created in 1989 by a consultant Stern Stewart, who advocates the idea that EVA can be an indicator par excellence of value creation and internal performance of companies because it incorporates the concept of risk in its design (Sharma & Kumar, 2012; El Badri & Aasri, 2022). As for MVA, it indicates whether a firm has added value to the capital it has obtained from investors while relying on market data. This is because EVA reflects the benefits generated and the costs associated with a given degree of risk. It is therefore easier for an organization to calculate its performance through one tool rather than several.

Indeed, the concept of EVA is different from the concept of value added. EVA is the surplus that a firm was able to generate after remunerating the suppliers of capital, while value added is the wealth created by the combined efforts of investors and other stakeholders without taking into account the remuneration of capital. Moreover, EVA is based on the assumption that the ability of firms to generate returns above shareholder expectations while taking into account the cost of capital invested, while value added remains focused on the performance of the entity without taking into account the cost of the entire capital structure. Nevertheless, EVA helps organizations identify underperformance, but does not highlight the root causes of inefficiencies at the operational level.

In its relationship with agency theory, EVA is proposed as an important mechanism for reducing agency costs by aligning the interests of managers with those of shareholders. This is done by integrating a variable part in the remuneration of managers based on the evolution of the EVA. In fact, EVA and MVA make it possible to measure the creation of value by managers in relation to an objective and also serve as a reference for compensation systems in order to reduce agency costs (Cherif & Dubreuille, 2005). Through this usage, managers are forced to think and act like owners, their own wealth becomes linked to that of shareholders. Another important benefit of using EVA for compensation is that it reduces the incentive for managers to manipulate accounting earnings (Young, 1997).

Indeed, EVA can be considered a management tool par excellence when used reasonably, it forces managers to consider the real cost of the capital they employ. Thus, EVA encourages managers to act like owners. According to Milunovich and Tsuei (1996) and Mamun and Mansor (2012), organizations can increase their EVA in three ways. First, firms can increase returns on current assets, efficient utilization will amplify operating profit without investing more in capital. Second, through the purposeful use of capital, EVA encourages firms to fully exploit capital without resorting to new sources of financing unless needed, since the return on capital will reduce the value of EVA. Finally, investment in projects with high profitability.

To calculate EVA efficiently, Stewart and Stern proposed adjustments so that the EVA model would be close to the real economic value of the organ-

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ization. Moreover, it has been attested that these adjustments would tend to ratify EVA as a tool for measuring value creation, as the real economic value allows investors and managers to monitor and control the exploitation of the organization's resources (Biddle et al., 1997).

From this perspective, the relationship between the measurement of a firm's internal value creation measured by EVA directly affects the market value creation calculated using MVA, since an increase in the firm's internal value will stimulate an increase in the organization's value in the market. Several authors have demonstrated results regarding the relationship between EVA and MVA, and this relationship indicates that EVA explains a significant portion of MVA. Indeed, Milunovich and Tsuei (1996) state that MVA uses financial places to gain insight into a firm's performance and credibility that it is exploiting its resources thoughtfully. In assigning a price to a stock, the market acts as a massively parallel catalyst that appreciates a firm's track record, its potential for new investment, and its future prospects. In order to achieve a high MVA, it is mandatory to produce a consistently positive and progressive EVA. EVA is closely related to MVA, as MVA can be defined as the present value of future EVA.

For this reason, several authors have attempted to explain that EVA is the most representative indicator of market value, and represents an absolute superiority over traditional indicators. Nevertheless, the idea of the supremacy of EVA as a measure of performance to explain MVA has been rigorously debated by researchers, the results of the studies present mixed results.

Indeed, Lehn and Makhija (1996) attempted to find a relationship between stock returns and the value creation indicators, EVA, MVA, ROA, and ROE, of 241 companies. The results showed that the relationship of EVA with stock returns is more significant than other traditional measures, giving EVA a slight advantage as a performance measure. In addition, Tan et al. (2011) were able to confirm the idea that EVA is the best measure of value creation and the most associated with MVA. Based on a study of 100 Chinese listed firms, the empirical results demonstrated the superiority of EVA over traditional accounting measures in its association with market value added, implying that EVA can more effectively reflect the change in firm value. In a context of Indian companies, Sharma and Kumar (2012) studied the association between MVA and EVA and other traditional measures like EPS, ROA, net income. The results show that EVA is significantly associated with MVA of Indian firms. Nakhaei and Hamid (2013) used the data of 87 non-financial companies listed on Tehran Stock Exchange over the period of 2004–2008 to examine the relationship between EVA, ROA, and ROE with the market value (MVA). The results indicate that there is a significant correlation between EVA and ROE with MVA, but there is no significant association between ROA and MVA.

In contrast to these results, other researchers have been able to demonstrate empirically that EVA does not reflect market value creation as measured by MVA. Indeed, Biddle et al. (1997) studied the explanatory power of EVA, net income and cash flow on market returns. The results revealed that net income has a more significant impact than the other performance measures, including EVA. Similarly, Chen and Dodd (2001) also compared the power of EVA on stock returns, compared to residual income and operating income, and concluded that operating income explains stock returns more significantly than EVA. Among others, De Wet (2005) studied the relationship between MVA and EVA, as well as cash flow, ROA, ROE and EPS over a ten-year period from 1995 to 2004, using data from 89 companies listed on the South African Stock Exchange. The results state that EVA did not show the strongest correlation with MVA. However, among the indicators chosen for the study, changes in cash flow explained the largest percentage of changes in MVA, ROA came second (15%) and EVA (8%) came third. Kim (2006) studied the relationship between EVA and other profitability measures on market capitalization; the results showed that cash flow had a more significant impact than EVA on market capitalization in the hotel business sector. Altaf (2016) empirically tested the claim that economic value added is a better measure than traditional measures for explaining market value. Using data from 325 Indian firms, the researcher concluded that operating income is strongly related to market value added, while, economic value added has a weaker but positive relationship with

MVA. In the same framework, Shah (2020) studied the superior impact of economic value added and traditional accounting measures for maximizing market value. The study included 190 companies listed on the London Stock Exchange over a five-year period from 2014 to 2018. Based on the results, the study finds no evidence that EVA is superior to MVA over traditional accounting measures. Therefore, this study reveals that traditional accounting measures are stronger indicators than EVA to explain the variation of MVA. More recently, Choong and Saravanan Muthaiyah (2021) sought to investigate the relationship between EVA and MVA in shareholder value creation. Based on 476 listed companies in Malaysia, they used EVA as an independent variable to explain its superiority in measuring market value creation. The results show that there is a weak relationship between EVA and MVA in the Malaysian context; furthermore, the results show that negative EVA leads to positive MVA; to this effect, therefore, there is a negative and significant relationship between EVA and MVA.

On the other hand, EVA is a modern tool used as a measure of companies' value creation. Its calculation allows you to establish the consistency between the size of a company's assets and the profitability it generates. But its application is always focused on companies that are listed on the financial markets, because it includes the cost of capital in its calculation and requires the calculation of a beta coefficient that measures the sensitivity of a given security and that of the market. However, for unlisted companies, it is absolutely difficult to measure EVA. For this reason, alternatives have been exploited to calculate the beta of unlisted companies and then calculate the EVA to measure the value creation of non-listed companies. (Anouar & Aasri, 2022). Three approaches can be distinguished to calculating accounting beta, analog, qualitative, and analytical (Britzelmaier, 2019). In the analogical approach, a panel of publicly traded firms is used as reference to exploit the related data and calculate the accounting beta. For qualitative approaches, they are used to calculate beta based on a subjective assessment of the systematic risk level of a company. This includes scoring models like the Boston Consulting Group's Model. As for the analytical approach, it includes the accounting beta, which may be viewed as an indispensable solution to estimate the MADAF beta and subsequently calculate the cost of equity for unlisted firms (Rutkowska-Ziarko, 2022).

Roque and Caicedo Carrero (2021) proposed a methodology for calculating EVA incorporating accounting beta for calculating the cost of capital. The researchers concluded that the EVA method based on accounting beta has a satisfactory degree of reliability to effectively measure performance for unlisted companies. The use of this method recognizes the strength of financial information reported by companies, making it an essential element in encouraging investment in unlisted companies.

From these findings, the main objective of this study is to verify whether there is a stronger relationship between the MVA and the normal EVA, as well as the EVA calculated on the basis of the accounting beta and the traditional indicators of value creation, ROE, ROA, and EPS, in the Moroccan market. The use of accounting beta to determinate market value is an alternative for researchers and practitioners interested in measuring value creation for companies that are not listed on the stock market in an emerging country like Morocco, characterized by a small pool of publicly traded companies, this differentiates the present study from previous studies that have addressed the same issue

Based on this logic, the hypotheses of this study are formulated as follows:

H_1: *There is a significant and positive association between MVA and normal EVA.*

H_2: *There is a significant and positive association between MVA and EVA calculated on the basis of the accounting beta of ROA.*

H_3: *There is a significant and positive association between MVA and ROA.*

H_4: *There is a significant and positive association between MVA and ROE.*

H_5: *There is a significant and positive association between MVA and EPS.*

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2. METHODOLOGY

2.1. Sample selection

This study focuses on companies traded on the Moroccan Stock Exchange in 2015–2019. Companies in the banking and insurance sectors were excluded. Also excluded were firms with incomplete information, newly listed firms from the Casablanca Stock Exchange.

The study sample consists of 32 firms. The time period selected for this study was deliberately excluding the shock years of the COVID-19 pandemic, which can disrupt the capital market, in Morocco (2020–2021–2022). The data consist of December closing prices for calculating the market beta. The profitability ratios, ROA and ROE, are determined on a yearly basis. To calculate the accounting beta of our sample, it is estimated over a period of 8 years before our period. Data have been collected on the official website of CSE.

2.1.1. Measurement variables

The objective of this study is to demonstrate the superiority or otherwise of EVA as an indicator of value creation. After reviewing the literature, the study selected MVA as a dependent variable. The independent variables selected are ROA, ROE, EPS, and EVA calculated on the basis of market beta, and finally EVA calculated on the basis of accounting beta of ROA.

2.1.2. Research model

In this study, the econometric approach of panel data was used to test the research hypotheses empirically. The findings are calculated using STATA 15. Econometric models are presented as follows:

$$MVA_{(i,t)} = \alpha + B_1 EVA_{(i,t)} + B_2 ROA_{(i,t)} + \\ + B_3 ROE_{(i,t)} + B_4 EPS_{(i,t)} + e_{(i,t)}, \quad (1)$$

$$MVA_{(i,t)} = \alpha + B_1 EVA\ ROA_{(i,t)} + \ldots \\ + B_3 EPS_{(i,t)} B_2 ROE_{(i,t)} + e_{(i,t)}. \quad (2)$$

Table 1. Variables

No.	Variables	Method	Authors
1	*MVA*	$MVA = \frac{\text{Market capitalization}}{\text{Economic capital}}$	Cherif and Dubreuille (2005), Tan et al. (2011), Shah (2020), Choong and Saravanan Muthaiyah (2021)
2	*EVA* – based on the market Beta-	$EVA = NOPAT - (CE \cdot WACC)$, Where ***NOPAT*** – Net profit after tax; ***CE*** – Capital Employed; WACC – Weightage Average Cost of Capital. The WACC calculated by weighting the cost of debt in the financing structure plus the cost of equity in the financing structure. Whereas cost of equity is calculated by using the capital asset pricing model	Lehn and Makhija (1996), Cherif and Dubreuille (2005), Shah (2020), Choong and Saravanan Muthaiyah (2021)
3	*EVA* – Economic Value Added. Based on the accounting Beta "ROA"	$EVA = NOPAT - (CE \cdot WACC)$, (based on the accounting Beta). The cost of equity is calculated by using the Accounting Beta: $Beta\ Coefficient = \frac{COV(RE, RIMm)}{VAR(RIMm)}$	Roque and Caicedo Carrero (2021), Anouar and Aasri (2022)
4	Return on Equity	$ROE = \frac{Net\ profit}{Total\ equit}$	Lehn and Makhija (1996), Cherif and Dubreuille (2005), Tan et al. (2011)
5	Return on Assets	$ROA = \frac{Profit\ After\ Tax}{Average\ Total\ Assets}$	Lehn and Makhija (1996), Cherif and Dubreuille (2005), Shah (2020)
6	Earnings per Share	$EPS = \frac{Net\ profit}{Total\ shares}$	Tan et al. (2011), Shah (2020)

3. RESULT AND DISCUSSION

3.1. Descriptive statistics

Table 2 shows the descriptive statistics results for the different items used in this study.

Table 2 shows that each of the variables has 160 observations thanks to the selection of the data to be used, eliminating organizations that do not have complete information to determine selection variables. In addition, all the variables are more volatile in terms of standard deviation, except for the ROA and ROE variables, which have a lower standard deviation. Moreover, the range of the majority of all variables within the research was high, confirming presence of aberrant values in the data observations.

3.2. Correlation between MVA and independent variables

The objective in using the correlation is to judge the relationship degree between variables (Bourbonnais, 2021). For this study, the results of the correlation between variable completeness are presented in Table 3.

Results of correlation show a positive correlation between the variable of interest (MVA) and all the explanatory variables. Among other things, the analysis of the correlation in terms of degree, shows the existence of a high correlation between the MVA and the EVA calculated through the market risk and the EVA calculated with the accounting beta based on the ROA, this is demonstrated by respective coefficients of 0.7159 and 0.7169.

3.3. Multicollinearity test

From the results of the multicollinearity testing for model 1 and 2, it is found out that the values of tolerance are .439 to .846 having VIF values from 1.18 to 2.28. All tolerance values are higher than 0.1 and VIF values are lower than 5. Therefore, the tolerance values and VIF values of the variables were similar to the Hair et al. (2018) recommended range. To this end, it can be concluded that there is no risk of multicollinearity between this study variables in the two models.

3.4. Specification test

In order to carry out this study, and in order to use econometrics on panel data, it is crucial to verify

Table 2. Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
MVA	160	21.63789	23.54562	–23.858	67.90682
ROE	160	.1036115	.1413374	–.4734518	.4841097
ROA	160	.0549637	.0449613	–.029156	.1603379
EPS	160	49.4038	27.66461	0	100.9879
EVA Bêta Market	160	3.5307	6.0307	–1.3208	1.9307
EVA Bêta ROA	160	3.6407	6.1404	–1.3108	1.1708

Table 3. Correlation study

	MVA	ROE	ROA	EPS	EVA Bêta Market	EVA Bêta ROA
MVA	1.0000					
ROE	0.4025	1.0000				
ROA	0.3633	0.7206	1.0000			
EPS	0.3761	0.3664	0.3036	1.0000		
EVA Bêta Market	0.7159	0.2917	0.1678	0.3477	1.0000	
EVA Bêta ROA	0.7169	0.2902	0.1656	0.3505	0.9992	1.0000

Table 4. Multicollinearity test

Model 1			Model 2		
Variables	V I F	Tolerance Value	Variable	V I F	Tolerance Value
ROE	2.28	0.439550	ROE	1.25	0.800655
ROA	2.10	0.475544	EPS	1.20	0.835887
EPS	1.25	0.797001	EVA Bêta ROA	1.18	0.846907
EVA Bêta Market	1.19	0.841977			
Mean VIF		1.71	Mean VIF		1.21

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the heterogeneous or homogeneous data (Hurlin, 2004). In this context, there are various tests to differentiate the model to be chosen. Among them are the Hsiao test and the Fisher test. In this regard, the Fisher test was used because of its speed and reliable application. The Fisher test results for the two models are shown in Table 5.

Table 5. Specification test

Model 1	Model 2
F (31, 124) = 7.20 Prob>F = 0.0000	F (31, 125) = 7.61 Prob>F = 0.0000

According to the Fisher test results, the associated probabilities are less than 5% for both models. Therefore, we agree with the model of individual effects, and it is adequate to estimate the panel models (Imen, Turki-Abdelhedi et al., 2014).

3.5. Hausman test

Before proceeding with estimating the results through a regression, it is important to choose the model criterion random effects versus a fixed effects model. In contrast, to determine the appropriate model to use, the Hausman test was employed. The results are shown in Table 6.

Table 6. Hausman test

Model 1	Model 2
Chi2 (1) = 12.94 Prob >chi2 = 0.0048	Chi2 (1) = 18.83 Prob >chi2 = 0.0001

These results show that the probability associated with both tests is 0.0048 for model 1 and 0.0001 for model 2, which are well below the 5% threshold (Shah, 2020). The results indicate that the preferred models are fixed effects for both models.

3.6. Regression result

For the first model, Table 7 explains the relationship between the MVA variable and the other independent variables, namely the EVA calculated on the basis of market beta and the other measures of value creation and financial performance (ROA, ROE, EPS). The first regression model displays R-squared value, which is 0.4528, meaning 45.28% of the MVA variation is justified due to ROA, ROE, EPS and market EVA, while 54.72% is due to the error. Regarding global significance of our model, F-value is 9.94 with probability of 0.0000, lower of 5%, meaning that Model 1 is overall significantly. The regression results show a positive and statistically significant relation between the MVA and the EVA calculated with market beta at the 1% threshold. In addition, the results for the ROE variable demonstrate a negative and statistically significant relation at the 1% threshold. On the other hand, it has been found that the independent variables ROA and EPS are insignificant with MVA.

For the second model, Table 7 shows the relationship between the MVA variable and the other independent variables, namely the EVA cal-

Table 7. Regression analysis

	MVA	Coef .	Std.Err.	t.	P>I t I	[95% Conf.	Interval.]
Model 1	ROE	–34.60905***	12.5593	–2.79	0.007	–59.46688	–9.751221
	ROA	50.87834	52.60071	0.97	0.335	53.2332	154.9899
	EPS	.0749463	.0526602	1.42	0.157	–.029283	.1791755
	EVA Bêta Market	1.9507***	3.5208	5.53	0.000	1.2507	2.6507
	Constant	11.83677	3.28929	3.60	0.000	5.326342	18.34719
	R^2	0.4528					
	F (4,124)	9.94					
	Prob>F	0.0000					
	MVA	**Coef.**	**Std. Err.**	**t**	**P> I t I**	**[95% Conf.**	**Interval]**
Model 2	ROE	–30.87445**	12.04785	–2.56	0.012	–54.71864	–7.030254
	EPS	.08459	.0523076	1.62	0.108	–.0189331	.1881132
	EVA Bêta ROA	1.9807***	3.4008	5.83	0.000	1.3107	2.6607
	Constante	13.4392	2.696246	4.98	0.000	8.102997	18.77541
	R^2	0.3994					
	F (3,125)	12.69					
	Prob>F	0.0000					

Note: *** Significant at 1%, ** significant at 5%.

culated based on the accounting beta of the ROA and the other variables, namely the ROE and the EPS. Regression of this model demonstrates an R-squared, which equals 0.3994, meaning that 39.94% of the variation in MVA is explained by the independent variables (EVA accounting beta of ROA, ROE, EPS), while 60.06% are caused by the error. The F-value of the second model is 12.69 and the probabilities of the model are 0.0000, indicating that the model is globally significant. Our regression findings demonstrate a statistically significant and positive relationship between MVA and EVA calculated with the accounting beta of ROA at the 1% threshold. In addition, the findings for the ROE variable show a negative relationship that is statistically significantly different at the 5% level. On the other hand, it was found that the independent variable EPS is not significant with the MVA.

3.7. Model validity

To consolidate the findings of the study, it is important to validate the models selected. In this context, three different tests have been carried out, namely, the normality test in the residual, the residual autocorrelation test and the heteroscedasticity test in the residual.

3.8. Normality test of the residuals

To verify if residuals produced after estimation of the fixed effects model are normal, the skewness and kurtosis test was applied. This test determines whether or not residuals from a multiple regression have a Normal or Anomalous distribution. The test findings are shown in Table 8.

Table 8. Skewness and kurtosis test result

	Model 1				Model 2		
Residue	Obs	Chi-2	ProB	Residue	Obs	Chi-2	ProB
	160	3.93	0.1404		160	4.42	0.1095

Based on the results of the tests, the associated probabilities are greater than 5% for both models, which allows us to state that the residuals of models 1 and 2 are normally distributed.

3.9. Autocorrelation test of residuals

According to Bourbonnaise (2021), the autocorrelation of the residuals captures the correlation of the error terms with respect to their time lagged values. In doing so, the study used the "Wooldridge test" to examine whether the residuals of the model are autocorrelated.

Table 9. Wooldridge test result

	Model 1			Model 2	
Residue	F (1,31)	Prob > F	Residue	F (1,31)	Prob > F
	15.405	0.0004		0.009	0.9254

For the autocorrelation of errors test, probability of the Fisher for the test is higher to 5% in model 2. In the framework, therefore, it can be concluded that there is no autocorrelation of the residuals. For model 1, the probability of Fisher's probability for this test is less to 5%, so that it can be concluded that there is an autocorrelation of the residuals.

3.10. Heteroscedasticity of residuals

However, to strengthen the results of the research, the test of heteroscedasticity has been performed. Indeed, according to Bourbonnaise (2021), in the situation in which the error variance is not a constant, the OLS estimation approach is inappropriate. To carry out the heteroskedasticity testing, Wald's test was used.

Table 10. Wald test result

	Model 1			Model 2	
Residue	Chi-2	Prob	Residue	Chi-2	Prob
	42110.11	0.0000		64887.65	0.0000

Referring to the results of the test for heteroscedasticity, we see that the respective test probabilities for both models are lower of 5%. Consequently, errors of both models are heteroscedastic. In order to rectify this problem, we use the command "robust" of the STATA for the model 2 to correct the heteroscedasticity, and the xtgls, panel (heteroskedastic) corr (independent) command for model 1 to correct both the heteroscedasticity and the autocorrelation of the errors.

For this purpose, the new estimation of the two models is as shown in Table 11.

For the first model, Table 11 shows the regression corrected for heteroscedasticity and error autocorrelation. The regression results reveal a statistically significant and positive relationship be-

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Table 11. Corrected regression for heteroscedasticity and autocorrelation

	MVA	Coef .	Std.Err.	z	P > I z I	[95% Conf .	Interval]
Model 1	ROE	.6594656	6.894395	0.10	0.924	–12.8533	14.17223
	ROA	1.7643***	27.92924	3.89	0.000	54.02405	163.5046
	EPS	.0057676	.0322937	0.18	0.858	–.0575269	.0690622
	EVA Bêta Market	2.9807***	1.8608	16.04	0.000	2.6207	3.3507
	Constant	3.734287	1.428175	2.61	0.009	.9351156	6.533459
Model 2	MVA	Coef.	Robust|Std. Err.	z	P> I z I	[95% Conf.	Interval]
	ROE	–7.742037	15.0187	–0.52	0.606	–37.17814	21.69407
	EPS	.0865992	0.060554	1.43	0.153	–.0320845	.2052829
	EVA Bêta ROA	2.2007***	5.7508	3.83	0.000	1.0807	3.3307
	Constant	10.15127	2.309726	4.40	0.000	5.624286	14.67824

Note: *** Significant at 1%, ** significant at 5%.

tween MVA and EVA calculated with market beta at the 1% threshold. In addition, the findings for the ROA variable show a statistically significantly positive relationship at the 1% level. On the other hand, it was found that the independent variables ROE and EPS are insignificant with MVA. These results confirm hypotheses H_1 and H_3, which respectively state that there is a positive and significant relationship between MVA and normal EVA and ROA. Furthermore, these results allow us to reject hypotheses H_4 and H_5, which stipulate that there is a positive and significant relationship between MVA, ROE, and PES.

These results are in line with the study by Tan et al. (2011) who showed that EVA is superior to traditional accounting measures in its association with MVA, implying that EVA can more effectively reflect the change in market value of companies. Similarly, the findings of this study corroborate with Sharma and Kumar (2012) who found that EVA has a positive and significant association with MVA in the context of Indian companies. Moreover, this result confirms the results of Nakhaei and Hamid (2013) who analyzed EVA while asserting its superiority in predicting market value. However, the findings of the present study are in contradiction with the findings of Altaf (2016) who claimed that MVA is strongly related to operating income than EVA. Furthermore, Shah (2020) demonstrated through regression analysis that traditional accounting measures are more strongly associated indicators with MVA than EVA. In addition, Choong and Saravanan Muthaiyah (2021) found that there is a weak relationship between EVA and MVA in the Malaysian context.

For the second model, Table 11 shows the regression corrected for error heteroscedasticity. The explanation of the findings of this new regression reveals a statistically significant and positive relationship between MVA and EVA calculated based on the accounting beta of ROA at the 1% threshold. Furthermore, we find that the independent variables ROE and EPS are insignificant with MVA. These results confirm the H_2 hypothesis which states that there is a positive and significant relationship between MVA and EVA calculated on the basis of the accounting beta of ROA. This finding reinforces the idea of Roque and Caicedo Carrero (2021) who calculated EVA by incorporating accounting beta to estimate the value creation non-listed firms.

In the end, the results of this study allow us to assert, firstly, the superiority of EVA over traditional measures as an indicator of value creation and financial performance. Second, the ability to use EVA calculated on the basis of accounting beta as a proxy for normal EVA and MVA, to calculate value creation for unlisted companies. Third, these results offer an opportunity for practitioners and academicians to measure value creation for non-listed firms in economies characterized by the dominance of SMEs and the low integration of firms into financial markets.

CONCLUSIONS

The choice of the indicator to measure the financial performance and the value created by an organization is always a problematic issue. Indeed, the measurement of the realized performance allows guaranteeing the profitability of the investments made in favor of a company in a sustainable way. In this context, there are several accounting and market measurement indicators that can be used to calculate the value creation and financial performance of organizations. On the other hand, the literature shows that traditional tools for measuring value creation such as ROE, ROA, EPS are insufficient because they ignore the cost of capital. This limitation has been resolved by the development of new measures of value creation such as EVA and MVA. On the other hand, EVA can only be calculated for listed companies, which makes it difficult to use it to measure the value creation of non-listed companies. To this end, alternatives have been used such as using accounting beta to calculate the cost of capital and then determining EVA. To this end, the article attempts to explain the explanatory power of the market value in relation to the classical approaches and in relation to the normal EVA and the EVA calculated through the accounting beta, in order to determine the superiority of the EVA over the classical indicators.

For this work, data from 32 companies listed on the Casablanca Stock Exchange during the period from 2015 to 2019 were used. The study used panel data modeling regression to experimentally test the research hypotheses.

The analysis conducted showed a statistically significant and positive association between MVA and EVA calculated with market beta, EVA calculated based on accounting beta based on ROA and ROA indicator. These results support the first three hypotheses that there is a positive relationship between MVA and normal EVA, EVA calculated based on the accounting beta of ROA, and the ROA indicator. On the other hand, ROE and ESP are statistically insignificant with MVA.

Therefore, the results support the superiority of EVA as a measure of value creation and financial performance, even when used for unlisted companies using EVA calculated based on accounting beta as an alternative to MVA and normal EVA. These results provide an alternative for experts when developing value creation strategies and for researchers attempting to measure value creation for unlisted companies. These results offer a practical use of EVA for decision makers who want to link executive compensation to EVA to ensure durable value creation, and a means of valuation for unlisted firms in countries characterized by a dominance of unlisted firms.

But, of course, there are some limitations to using accounting beta to calculate risk and then EVA. Indeed, the frequency and accessibility of accounting disclosure and the quality of financial data for unlisted firms are problematic, as a large proportion of unlisted firms do not have access to a certified auditor to confirm the quality and confidence in the reported information. Furthermore, the research results focus on a single emerging market, future comparative research on other capital markets using other indicators such as Tobin's Q and others may reinforce the idea of the superiority of EVA.

AUTHOR CONTRIBUTIONS

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Formal analysis: Anouar Faiteh, Mohammed Rachid Aasri.
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