Executive compensation and the EVA and MVA performance of South African listed companies

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A B S T R A C T

The media regularly report a growing incidence of non-alignment of executive pay and performance, and in some cases, no link between the two whatsoever. The advent of new measures of shareholder wealth such as economic value added (EVA) and market value added (MVA) have allowed some companies to link executive remuneration to shareholder wealth creation. The purpose of this study is to test the relationship between executive remuneration of South African listed companies and EVA and MVA, as well as traditional performance measures such as return on assets (ROA) and return on equity (ROE). The findings indicate that there is indeed a significant relationship between executive remuneration and EVA and MVA, but that the correlation is better between executive remuneration and ROA and ROE. It is concluded that South African companies need to shift the emphasis away from traditional performance measures to value-creation measures when designing and implementing executive compensation plans.

Key words: executive compensation, economic value added (EVA), market value added (MVA), return on assets (ROA), return on equity (ROE), weighted average cost of capital (WACC)

Introduction

This study investigates the existence and strength, if any, of the relationship between executive compensation and different measures of financial performance. Both

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traditional accounting measures such as ROA and ROE and the newer shareholder value-creation measures such as EVA and MVA are used as independent variables that impact on executive compensation. Based on a sample of South African listed companies and data for the five years from 2006 to 2010, it was found that there is a significant relationship between executive remuneration and EVA and MVA, but that there is a stronger relationship between executive remuneration and ROA and ROE.

In recent years, few issues have sparked more ongoing controversy than executive compensation. The topic of executive pay has been highly publicised in the media for some time, and a large volume of research related to it has seen the light, with the bulk of contributions coming from the USA, Canada, the UK and Europe. In the wake of the economic recession that took hold in 2008, some analysts such as Mueller (2006: 625) cited excessive directors' remuneration as a key contributing factor. The remuneration of management comes in many different guises, which include basic salaries, bonuses, share purchase plans and share option plans, as well as other perks that are sometimes hard to quantify. Mueller (2006: 625) remarked that the Enron, WorldCom and Parmalat scandals involved, among other things, large loans to managers at negligible interest rates.

Colvin (2008: 12) referred to "CEOs getting staggering pay despite big problems at their companies" and the need for compensation to line up with performance. In an article entitled 'The wages of sin' by Xiaoning (2009: 12), it was reported that Chinese investors were outraged by reports of senior executives of loss-making companies who rewarded themselves with huge compensation packages. The same outcry against excessive directors' remuneration has been heard from across the globe, and South Africa has been no exception. Trump (2005) quoted South African executive pay analyst, Mark Bussin, asking, "Where has the link gone between performance and pay?" Rose (2009: 20) reported on directors of top South African companies receiving bonuses even when profits dropped by substantial margins.

Structure of the paper

The paper is organised according to the following structure:

- Literature study;
- EVA and MVA as performance measures of choice;
- Research questions and hypotheses;
- Research method and data;
- Results and interpretation; and
- Conclusions.

Literature study

Agency theory, viewing the shareholders as the principals and the management as the agents, is the golden thread that runs through past research on executive compensation and performance. Jensen and Meckling (1976) found that even under the assumption that a manager owns all the shares of a company, he/she is unlikely to maximise the value of the firm. Agency costs, such as incentive schemes, are therefore incurred by companies to motivate management to act in the interests of the owners and maximise shareholder wealth on a sustainable basis. McKnight, Milonas, Travlos and Weir (2009: 22) stated that one way to reduce agency costs is to have effective corporate governance mechanisms. They also commented that the publication of Best Practices by the Cadbury Committee in the UK in 1992 resulted in a worldwide wave of reforms in the corporate governance systems. Fama (1980: 288), elaborating on agency problems, explained that the separation of ownership and control can be an efficient form of economic organisation. According to Fama (1980: 289), competition from other firms will cause a specific firm to spontaneously develop mechanisms that will efficiently govern the performance of the combined team of employees, as well as that of the individual members. Basu, Hwang, Mitsudome and Weintrop (2007: 75) reached the conclusion that overall, executive pay decreases as corporate governance structures become stronger.

Although agency theory has been the dominant force behind efforts to link executive pay and performance, there have been some researchers questioning the validity of this view. Bruce, Buck and Main (2005: 1504) argued that theoretical developments in institutional theory indicate that the agency theory view of pay and performance may be an overly narrow focus. They advocate the use of three theories as different 'lenses' to look at executive remuneration, namely the principal-agent, executive power and stewardship/stakeholder theories. According to McConvill (2006: 425), the stewardship theory postulates that managers focus on intrinsic rewards that are not easily quantified and concludes that the pay-for-performance principle is flawed because it fails to recognise the broader motivations of human nature. Dittman and Maug (2007: 303) concluded that the standard principal-agent model cannot explain observed executive compensation contracts.

Past research investigating the link between executive remuneration and performance reflects a lack of consensus (Bruce et al. 2005: 1493). In the ensuing sections, some of the research sources supporting the link between executive pay and performance are briefly overviewed. Murphy (1985: 40) found a strong link between executive compensation and corporate performance in terms of shareholder returns and growth in firm sales. Gomez-Mejia, Tosi and Hinkin (1987: 65) used chief executives officers' (CEO) pay as a proxy for executive compensation, and their study

concluded that CEO pay is more responsive to performance in owner-controlled firms with dominant shareholders. Main (1991: 227) found evidence of executive remuneration policy having an impact on the alignment between the interests of executives and those of shareholders. In a study by Conyon, Peck and Sadler (2000: 15) based on companies listed in the UK for the period 1985 to 1995, the findings indicated that directors' pay is positively related to shareholder returns, but not to earnings per share (EPS).

Fatemi, Desai and Katz (2003: 177) found executive remuneration to have a strong positive relationship with MVA and a weaker positive relationship with EVA. The links between executive remuneration and both MVA and EVA were found to be better than for traditional performance measures such as ROA. In a study by Merhebi, Pattenden, Swan and Zhou (2006: 495) on the remuneration of Australian CEOs, a positive and statistically significant pay–performance relationship was found. These results were reported to be consistent with international findings for firms in the USA, UK and Canada. Zhu (2007: 218) used a database of 986 listed Chinese enterprises and found a positive correlation between top management remuneration and ROE, total assets and the numbers in top management. Kato, Kim and Lee (2007: 52) documented a significant relationship between the cash compensation of Korean executives and stock market performance. Buck, Liu, and Skovoroda (2008: 15) reported that the pay–performance elasticity for Chinese companies was almost identical to that of similar findings in the USA. Cunat and Guadalupe (2009: 504) found that in the banking and financial sectors, deregulation and the increase in competition led to more reliance on performance-related pay. Frydman and Saks (2010: 2131) disclosed in their study of a long-term perspective of executive compensation from 1936 to 2005 that the relationship between pay and firm size was weak between the 1940s and the 1970s, but that the relationship has been much stronger since then as managerial incentives increased.

Some researchers did not find significant positive links between remuneration and performance. For instance, Jensen and Murphy (1990: 261), after analysing the remuneration of 2 000 CEOs, concluded that the relation between CEO wealth and shareholder wealth "was small and had fallen by an order of magnitude in the last 50 years". O'Neill and Iob (1999: 74) analysed Australian listed companies and found that there was little evidence to suggest a consistent trend linking executive pay to company performance. Alshimmiri (2004: 117) investigated the real estate investment trust (REIT) sector in the Arabic Emirates and found that there is a negative relationship between cash managerial remuneration and firm performance in terms of ROA and ROE. Abdullah (2006: 172) reported that directors' remuneration in

Malaysian companies is not associated with profitability as measured by ROA, but is related to growth and size.

Mueller (2006: 625) commented that managerial incomes in the USA increased by far more than could be accounted for by increases in managerial productivity in the 1990s. He also concluded that company size and not profitability is the best predictor of managerial compensation. Haynes, Thompson and Wright (2007: 793) also found that firm size has a significant impact on executive remuneration and that the responsiveness of executive pay to firm performance is much smaller than to firm size. In a study conducted in the Netherlands, Duffhues and Kabir (2008: 58) found no evidence of a positive pay–performance relationship and concluded that many directors receive pay for reasons unrelated to performance. Fernandes (2008: 40) performed a study on Portuguese companies and reported that there is no significant link between executive pay and shareholders' performance for companies with one or more non-executive board members. He did, however, find a positive pay–performance relationship for the subset of companies without non-executive board members. Gabaix and Landier (2008: 93) reported that CEO pay between 1980 and 2003 can be linked strongly to the sixfold increase in the market capitalisation of large companies during the period.

Other international research of note on executive remuneration is now discussed briefly. Pass (2003: 27), as well as Buck, Bruce, Main and Udueni (2003: 1723), researched the impact of long-term incentive plans (LTIPs) on performance in the UK. Pass (2003: 27) found that the majority of LTIP schemes were undemanding and rewarded average rather than exceptional performance. Buck et al. (2003: 1723) concluded that LTIPs were associated with reductions in the sensitivity of executives' total rewards to shareholder returns and therefore questioned their effectiveness. Simms (2004: 45) quoted Colin Melvin, corporate governance director at a UK pension management company, as saying, "… the entire system of executive remuneration in the UK is flawed and threatens the health of the economy" and, "The structure needs overhauling, and the unholy alliance of ambitious remuneration consultants, spineless remuneration committees, supine institutional investors and greedy executives needs recalibrating." Peng and Röell (2008: 175) found that option-based executive compensation causes executives to focus too much on the short-term share price. Walker (2010: 472) also found that executive compensation in the United States is inadequately linked to long-term company performance.

Jensen and Murphy (2004: 98) undertook a comprehensive study of executive remuneration in the USA and suggested that there is "substantial evidence that we can do better in future" and that "the changes required to put the balance back in the remuneration system will not be easy to implement". Hovy (2005: 38) inferred that

global performance-based equity plans would, in the foreseeable future, be the most viable mechanism to align executive performance to shareholder wealth creation. Brick, Palmon and Wald (2006: 421) provided evidence of excessive executive compensation associated with firm under-performance. Wilkinson (2009: 41) expressed the opinion that it must be ensured that executives get the right rewards, in the right circumstances, for the right reasons. Sun, Zhao and Yang (2010: 780) commented that the pay–performance relationship appears to be the most studied topic in Asian research on executive compensation and highlighted numerous sources linking compensation to performance. Jensen and Murphy (2010) found that the structuring of compensation packages to provide big rewards for outstanding performance and meaningful penalties for poor performance has proved to be an elusive goal.

A brief discussion of local South African research on the topic is now given. Bussin (2003: 20) addressed agency theory and pointed out the need for appropriate corporate governance and transparency. Blair, Bussin and De Beer (2006a: 65) commented from a consultant's perspective that most South African executive remuneration schemes at the time did not include performance requirements that are properly aligned with shareholder measures. Blair, Bussin and De Beer (2006b: 27) advised that the best and most tax-efficient solution for a long-term mechanism is one where fully paid-up shares are financed through long-term cash bonuses. King (2009: 48) specified that companies should adopt remuneration policies and practices that create value for the company in the long term. Furthermore, these policies and practices should be aligned with the company's strategy, be reviewed regularly and be linked to the executive's contribution to company performance. The international accounting standard IFRS 2 (2009) became mandatory in South Africa on 1 January 2009; it specifies that an entity must reflect in its profit and loss and financial position the effects of share-based payment transactions, including expenses associated with transactions in which share options are granted to employees. Adherence to IFRS 2 not only ensures that companies disclose the full impact of the cost of share-based remuneration, but also adds to the transparency required for good corporate governance.

Authers (2010), quoting from a new book entitled *Value* by a group of McKinsey consultants, concluded that it is 'crazy' to judge executives by earnings per share, or by their company's share price. Blaine (2010) quoted executive remuneration consultant Mark Bussin as saying that local South African banker remuneration is still conservative compared to international companies. Van Zyl Smit and Nel (2010) advised that remuneration policies should embrace the three basic principles of appropriateness, fairness and effectiveness and should be tightly aligned with the

long-term value and soundness of the firm. Audit and consulting group PWC (2011) stressed in their annual report on directors' remuneration that organisations must be able to indicate a clear link between the incentive awarded and the performance of the organisation.

In summary, it is clear that past research about executive remuneration and performance has yielded mixed, inconclusive results and that much creative thinking would be required in future to establish sound, innovative remuneration policies that are synchronised with the long-term strategies of firms. One is also left with the impression that performance will remain a key requirement in order to justify executive remuneration. In the next section, the ways in which performance can be measured more appropriately are discussed.

EVA and MVA as performance measures of choice

The literature study reveals that past research on executive remuneration and performance, by and large, used traditional accounting performance measures such as EPS, ROA and ROE to measure corporate financial performance. The main flaws of these measures are that they do not reflect the risk involved to a company as embodied in the cost of own capital (equity) and that they are prone to manipulation. Ground-breaking work by Stewart (1991) and Stern (1993), working together in the Stern Stewart Consulting firm, introduced the concepts of EVA and MVA as better measures of corporate performance. EVA is an internal risk-adjusted measure of performance that takes into account the full weighted average cost of a company's capital; it yields a positive result if the company earns after-tax operating returns that exceed the cost of capital. MVA is determined by subtracting the adjusted book values of the fixed assets and net working capital from the market value of the shares and long-term borrowings. Theoretically, MVA is also the present value of all future EVAs (Stern 1993: 36). It must be borne in mind that MVA is affected not only by what the company does (EVA), but also by external factors that influence its share price and that the company has no control over. However, it is believed that companies that manage to earn positive and growing EVAs consistently will maximise their MVA in the long run.

Since the introduction of EVA and MVA, numerous research sources have concluded that EVA has a stronger correlation with MVA (or shareholder returns) than the other accounting measures tested. Those in support of EVA include O'Byrne (1996: 119), Uyemura, Kantor and Pettit (1996: 98) and Grant (1996: 44; 1997: 39). Ross (1998: 122), Ehrbar and Stewart (1999: 19), Krafft and Ravix (2005: 132) and Sharma and Kumar (2010: 205) provide anecdotal evidence of the widespread

implementation of EVA and MVA by top companies in the USA as well as Europe, Latin America, Asia, and even New Zealand and South Africa. However, following the initial strong support for EVA, some research results appeared, indicating that EVA does not in fact have superior explanatory power in relation to MVA, compared to the other traditional accounting measures. This category of researchers includes Biddle, Bowen and Wallace (1999: 69), and Kyriazis and Anastassis (2007: 94).

Fatemi et al. (2003: 171) produced some innovative work by classifying companies into four groups, depending on their level of EVA and MVA. Companies are first sorted into three groups of equal number in terms of both EVA and MVA. Then four categories are discerned, namely high EVA and high MVA (winners), low EVA and high MVA (holders of real options), high EVA and low MVA (problem children) and low EVA and low MVA (losers), as depicted in Figure 1.

	High	'Problem children'	'Winners'
EVA		'Losers'	'Holders of real options'
	Low	**Low**	**High**
		MVA	

Source: Adapted from Fatemi et al. (2003: 171)

Figure 1: EVA and MVA grid

The categorisation of companies according to the grid in Figure 1 will be used to determine whether there is a difference in the remuneration/performance relationships for the various groups of companies. In concluding the discussion of EVA and MVA, the author shares the view of Shiely (1996) and Fatemi et al. (2003: 161), who consider EVA and MVA to be reasonable proxies for the measurement of owner wealth maximisation while taking into account the relative risk-based costs of doing so. The research questions and hypotheses arising from the literature study are addressed in the next section.

Research questions and hypotheses

The first research question is whether there is a positive relationship between executive remuneration and EVA and MVA. This hypothesis is therefore:

H_1 = *There is a statistically significant positive relationship between executive remuneration and EVA and MVA.*

A second related research question is whether the relationship between executive remuneration and EVA and MVA is stronger than for executive remuneration and the traditional measures of ROA and ROE. Therefore the second hypothesis is:

H_2 = *The relationship between executive remuneration and EVA and MVA is stronger than that of executive remuneration and ROA and ROE.*

The third research question is whether the relative levels of EVA and MVA, according to the EVA and MVA grid, have an impact on the strength of the remuneration and performance relationships. The third hypothesis is therefore:

H_3 = *There is a significantly different relationship between executive remuneration and EVA and MVA for the four categories of companies.*

In the next section, the research method and data are discussed.

Research method and data

The research method entails using data obtained from the financial data provider McGregor BFA and applying regression analysis to test the hypotheses as stated. Certain additional statistical tests are performed to test the robustness of the data. The companies selected for the study are all listed on the Johannesburg Securities Exchange (JSE) South Africa, and the period covered is the five-year period from 2006 to 2010.

The dependent variable, total directors' remuneration (TDR), includes basic salary and bonus, as well as other remuneration such as share-based payments and options. The five independent variables believed to influence directors' remuneration are ROA (after-tax percentage), ROE (after-tax percentage), standardised EVA (SEVA), standardised MVA (SMVA) and weighted average cost of capital (WACC). Both EVA, which is calculated as an annual amount in its raw form, and MVA, which is calculated as a cumulative amount in its raw form, were standardised in order to control for firm-size effects. The invested capital (IC_{beg}) at the beginning of the year was used in the standardisation process as follows:

SEVA = EVA / ICbeg

SMVA = $(MVA_t - MVA_{t-1}) / IC_{beg}$

Hence, for EVA, the standardised version, SEVA, is calculated by dividing the annual EVA amount by the invested capital at the beginning of the year. For MVA, the standardised version, SMVA, is determined by dividing the difference between the MVA at the end of the year and the MVA at the beginning of the year by the invested capital at the beginning of the year. WACC is included as a proxy for risk in order to control for company risk differences, and it is expected that the higher levels of overall company risk as expressed by WACC would lead to directors requiring higher levels of remuneration (Fama 1980).

The descriptive statistics are presented in Table 1, and the correlations between the different variables are specified in Table 2.

Table 1: Descriptive statistics

	TDR	SEVA	SMVA	ROE	ROA	WACC
Mean	17215.13	–0.061575	–7.416888	11.27938	12.91806	11.34353
Median	10456.00	0.014200	0.021020	17.56830	14.07680	10.99010
Maximum	657949.0	4.352571	1012.509	469.5515	118.2517	28.91060
Minimum	0.000000	–13.38705	–7267.529	–1728.504	–600.0000	2.423700
Std. Dev.	28096.67	0.745818	252.9926	93.98454	32.98887	3.760509

It is noted that both the means for SEVA and SMVA were negative for the five-year period 2006 to 2010, indicating that on average, South African companies destroyed wealth on an annual basis in terms of an internal measure, EVA, and in terms of an external measure, MVA.

Table 2: Correlations

	TDR	SEVA	SMVA	ROE	ROA	WACC
TDR	1.0000	0.0772	0.0193	0.0743	0.0692	–0.0224
SEVA	0.0772	1.0000	0.1036	0.0780	0.3076	–0.1067
SMVA	0.0193	0.1036	1.0000	0.0143	0.2724	–0.0047
ROE	0.0743	0.0780	0.0143	1.0000	0.3103	–0.0199
ROA	0.0692	0.3076	0.2724	0.3103	1.0000	0.0078
WACC	–0.0224	–0.1067	–0.0047	–0.0199	0.0078	1.0000

A perusal of the one-on-one correlations of the variables included in the regression analysis in Table 2 reveals no serious co-linearity, as none of the correlation coefficients are significantly high.

Results and interpretation

In order to examine the relationship between directors' remunerations and relevant performance indicators, a panel data approach was used. Although panel data have limitations such as design and data collection problems, its advantages include:

- controlling for heterogeneity amongst companies;
- allowing for more degrees of freedom;
- better ability to study dynamics of adjustment;
- ability to construct and test more complicated behavioural models than purely cross-section or time series;
- more informative data; more variability; less co-linearity among the variables; and
- more efficiency of the estimators.

All the models were run with total director remuneration as the dependent variable, and Table 3 shows that Model 1 used SEVA and WACC as the independent variables.

Table 3: Model 1 SEVA

Dependent variable: TDR				
Variable	Coefficient	Std. error	t-Statistic	Prob.
SEVA	2130.302	536.6753	3.969443	0.0001
WACC	–121.2447	53.51580	–2.265588	0.0237
C	16094.49	877.8626	18.33372	0.0000
Weighted statistics				
R-squared	0.043928	Mean dependent var		41741.80
Adjusted R-squared	0.041876	S.D. dependent var		42618.83
S.E. of regression	26276.86	Sum squared resid		6.44E+11
F-statistic	21.41087	Durbin-Watson stat		0.615291
Prob(F-statistic)	0.000000			
Unweighted statistics				
R-squared	–0.002954	Mean dependent var		17215.13
Sum squared resid	7.39E+11	Durbin-Watson stat		0.652357

Although the adjusted R-squared of approximately 4.2% of this model represents weak correlation, the t-value of SEVA of 3.97 (rounded) indicates that the coefficient of this independent variable is significant at the 1% level. The coefficient WACC

was significaňt at the 10% level. Contrary to expectations, the negative coefficient of WACC indicates an inverse relationship between company risk and director remuneration. The coefficient of WACC was negative for all the models tested (Models 1, 2, 3, 4, 5, 6 and 7).

Table 4 reveals that Model 2 specified SMVA and WACC as the independent variables.

Table 4: Model 2 SMVA

Dependent variable: TDR				
Variable	Coefficient	Std. error	t-Statistic	Prob.
SMVA	1.715275	0.900020	1.905820	0.0570
WACC	–211.6808	19.15809	–11.04916	0.0000
C	16969.78	602.3166	28.17419	0.0000
Weighted statistics				
R-squared	0.010515	Mean dependent var		41920.26
Adjusted R-squared	0.008392	S.D. dependent var		42111.72
S.E. of regression	26367.30	Sum squared resid		6.48E+11
F-statistic	4.952115	Durbin-Watson stat		0.599698
Prob(F-statistic)	0.007256			
Unweighted statistics				
R-squared	–0.008150	Mean dependent var		17215.13
Sum squared resid	7.43E+11	Durbin-Watson stat		0.647131

The result of this model was that the strength of correlation was even weaker than for Model 1 with an adjusted R-squared of 0.8% (rounded). However, the coefficient of SMVA was found to be significant at the 10% level, and the coefficient of WACC proved to be significant at the 1% level.

Table 5 presents Model 3, which took ROE and WACC as the independent variables.

The adjusted R-squared of 4.3% again represents a low level of correlation, but the coefficients of both the independent variables, namely ROE and WACC, proved to be significant at the 1% level.

Table 6 shows that Model 4 had ROA and WACC as independent variables.

The coefficients of both independent variables, ROA and WACC, were found to be significant at the 1% level. The level correlation was weak with an adjusted R-squared of 3.5%.

Table 5: Model 3 ROE

Dependent variable: TDR				
Variable	**Coefficient**	**Std. error**	**t-Statistic**	**Prob.**
ROE	23.54926	6.311432	3.731207	0.0002
WACC	–211.4139	21.73779	–9.725641	0.0000
C	16614.27	743.6893	22.34034	0.0000
Weighted statistics				
R-squared	0.045277	Mean dependent var		42136.57
Adjusted R-squared	0.043228	S.D. dependent var		43099.38
S.E. of regression	26194.60	Sum squared resid		6.39E+11
F-statistic	22.09974	Durbin-Watson stat		0.633147
Prob(F-statistic)	0.000000			
Unweighted statistics				
R-squared	–0.003596	Mean dependent var		17215.13
Sum squared resid	7.40E+11	Durbin-Watson stat		0.656222

Table 6: Table 6: Model 4 ROA

Dependent variable: TDR				
Variable	**Coefficient**	**Std. error**	**t-Statistic**	**Prob.**
ROA	57.60806	11.14204	5.170335	0.0000
WACC	–201.4130	28.16186	–7.151978	0.0000
C	16031.54	723.5053	22.15815	0.0000
Weighted statistics				
R-squared	0.036689	Mean dependent var		41936.23
Adjusted R-squared	0.034622	S.D. dependent var		42240.71
S.E. of regression	26227.75	Sum squared resid		6.41E+11
F-statistic	17.74834	Durbin-Watson stat		0.615251
Prob(F-statistic)	0.000000			
Unweighted statistics				
R-squared	–0.004122	Mean dependent var		17215.13
Sum squared resid	7.40E+11	Durbin-Watson stat		0.649970

For Model 5, SEVA, SMVA and WACC were taken together as independent variables. The results are shown in Table 7.

Table 7: Model 5 SEVA + SMVA

Dependent variable: TDR				
Variable	Coefficient	Std. error	t-Statistic	Prob.
SEVA	2094.514	532.5731	3.932821	0.0001
SMVA	1.339336	0.472734	2.833167	0.0047
WACC	–117.5032	54.88787	–2.140786	0.0326
C	16057.77	872.4130	18.40616	0.0000
Weighted statistics				
R-squared	0.048582	Mean dependent var		41737.64
Adjusted R-squared	0.045516	S.D. dependent var		42619.41
S.E. of regression	26289.46	Sum squared resid		6.43E+11
F-statistic	15.84652	Durbin-Watson stat		0.618093
Prob(F-statistic)	0.000000			
Unweighted statistics				
R-squared	-0.002826	Mean dependent var		17215.13
Sum squared resid	7.39E+11	Durbin-Watson stat		0.652596

The results indicate relatively weak correlation with the adjusted R-squared of 4.6% (rounded). In this instance, both SEVA and SMVA had coefficients significant at the 1% level. The coefficient of WACC was significant at the 10% level.

ROA, ROE and WACC were the independent variables in Model 6, as indicated in Table 8.

The results of this model indicate a slightly higher level of correlation compared to the previous models with an adjusted R-squared of 5.4% (rounded). The coefficients of all three independent variables, namely ROE, ROA and WACC, were all significant at the 1% level.

Model 7 used SEVA, SMVA, ROA, ROE and WACC together as the independent variables and is presented in Table 9.

As expected, this model that combined the independent variables proved to have a much stronger level of correlation with an adjusted R-squared of 19.2%. The coefficients of SEVA, ROE and EVA were significant at the 1% level, while the coefficient of WACC was significant at the 5% level. The coefficient of SMVA was not significant at any of the levels specified.

Table 8: Model 6 ROE+ ROA

Dependent variable: TDR				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
ROE	16.76019	5.645954	2.968532	0.0031
ROA	38.88419	9.829294	3.955949	0.0001
WACC	–198.9058	26.05519	–7.634018	0.0000
C	16013.48	719.5185	22.25583	0.0000
Weighted statistics				
R-squared	0.057274	Mean dependent var		41915.40
Adjusted R-squared	0.054236	S.D. dependent var		42330.62
S.E. of regression	26126.81	Sum squared resid		6.36E+11
F-statistic	18.85383	Durbin-Watson stat		0.637354
Prob(F-statistic)	0.000000			
Unweighted statistics				
R-squared	–0.001432	Mean dependent var		17215.13
Sum squared resid	7.38E+11	Durbin-Watson stat		0.655452

Table 9: Model 7 ROA + ROE + EVA + MVA

Dependent variable: TDR				
Variable	Coefficient	Std. error	t-Statistic	Prob.
SEVA	1364.493	293.4727	4.649473	0.0000
SMVA	0.586469	0.652367	0.898986	0.3689
ROE	18.11460	5.687430	3.185024	0.0015
ROA	23.84458	7.717692	3.089600	0.0021
WACC	–122.1917	61.26452	–1.994494	0.0464
C	15487.42	859.4844	18.01943	0.0000
Weighted statistics				
R-squared	0.192425	Mean dependent var		42141.03
Adjusted R-squared	0.188079	S.D. dependent var		44734.69
S.E. of regression	26110.69	Sum squared resid		6.33E+11
F-statistic	44.27157	Durbin-Watson stat		0.646246
Prob(F-statistic)	0.000000			

The results of each individual model are summarised and presented in Table 10.

Table 10: Summary of results

Dependent variable: TDR							
MODELS	1	2	3	4	5	6	7
SEVA	2130.302*** (3.97)				2094.514*** (3.933)		1364.493*** (4.649)
SMVA		1.716* (1.906)			1.34*** (2.833)		0.586 (0.899)
ROE			23.549*** (3.731)			16.760*** (2.969)	18.115*** (3.185)
ROA				57.608*** (5.170)		38.884*** (3.956)	23.845*** (3.09)
WACC	–121.245* (–2.266)	–211.681*** (–11.049)	–211.414*** (–9.726)	–201.413*** (–7.152)	–117.503* (–2.141)	–198.906*** (–7.634)	–122.192** (–1.994)
C	16094.49*** (18.334)	16969.78*** (28.174)	16614.27*** (22.340)	16031.54*** (22.158)	16057.77*** (18.406)	16013.48*** (22.256)	15487.42*** (18.019)
F-statistic (p-value)	21.411*** (0.000)	4.952*** (0.007)	22.10*** (0.000)	17.748*** (0.000)	15.847*** (0.000)	18.854*** (0.000)	44.272*** (0.000)
R²	0.044	0.01	0.045	0.037	0.049	0.057	0.192
Adjusted R²	0.042	0.008	0.043	0.035	0.046	0.054	0.188

Note: Coefficients reported with t-statistics in parenthesis. Heteroskedasticity corrected for.

***, **, *   indicate significance at the 1%, 5% and 10% levels respectively.

Given the two hypotheses to be tested:

- H1: Model 5 indicates that there is a statistically significant positive relationship between executive remuneration and EVA and MVA. Both indicators of performance are positively related to total directors' remuneration at a 1% level of significance. Hypothesis 1 is therefore accepted.
- H2: There appears to be a stronger relationship between executive remuneration and ROA and ROE than between executive remuneration and EVA and MVA. The adjusted R² is higher for Model 6, which estimates both ROA and ROE together, than for Model 5, which estimates EVA and MVA together. Hypothesis 2 is therefore rejected. This finding is contrary to that of Fatemi et al. (2003), who found, based on a sample of American companies, a stronger relationship between executive remuneration and EVA and MVA, compared to the relationship between executive remuneration and ROA and ROE. From this result one may infer that South African companies still place a greater emphasis on performance as reflected by the traditional measures of ROA and ROE in determining executive

compensation, rather than the value-based measures of EVA and MVA. It may also be an indication that South African companies need to change their perception of what constitutes good performance in determining directors' remuneration so that value-creation rather than accounting profit is incentivised.

Robustness tests

A battery of tests was run on the different models to check the validity of the results:

1. *Endogeneity* (or misspecification) of each pooled model: Endogeneity refers to a correlation between the error term and one or more of the independent variables. In other words, there are individual or time effects that are correlated with the independent variables. For this the Hausman (1978) test is used. Under the Hausman test, the H_0 is $E(u_{it}|X_{it}) = 0$ $E(u_{it}|X_{it}) = 0$ (i.e. the error term and independent variables are uncorrelated). In terms of data analysis and modelling, the presence of endogeneity is of great concern. If endogeneity is found to be present in any of the models, this would call for the use of an instrumental variable (IV) approach. Fortunately all models estimated in this paper passed the endogeneity test (i.e. they are correctly specified).

2. *Serial correlation*: Serial correlation (SC) refers to a situation where a variable is correlated with its own lags or the lags of other dependent variables in the model. The Durbin-Watson test is used to test for serial correlation in panel data. Unfortunately, due to the outliers in the WACC data that had to be removed, the test for serial correlation could not be done, as there were now insufficient observations in the panel.

3. *Heteroskedasticity*: This refers to non-constant variances related to the error term in the model. This is a problem since it means that there is great variability in the model (i.e. parameter estimates do not converge to their actual values). This problem is corrected by using White's cross-section coefficient variance method. The White cross-section method assumes that the errors are contemporaneously (cross-sectionally) correlated and this weighting system corrects for heteroskedasticity. The method treats the pool regression as a multivariate regression (with an equation for each cross section) and computes robust standard errors for the system of equations. Cross-section weights were also incorporated in the estimations. In the EViews programme, this will estimate a feasible GLS specification assuming the presence of cross-section heteroskedasticity as well. The test itself could not be conducted on the models because of the outliers in the WACC data that had to be removed. However, the models were still corrected for potential heteroskedasticity as this hardly alters the structure and features of the data (Gujarati 1995).

4. *Stationarity*: A non-stationary process has a variable variance and a mean that does not return to a long-run mean over time, whereas a stationary process reverts around a constant long-term mean and has a constant variance independent of time. Using non-stationary time series data in financial models produces unreliable results and may indicate a relationship between two variables where one does not exist. The solution is to transform the data so as to become stationary, and this done by done by differencing. The disadvantage of differencing is that the process loses one observation each time the difference is taken. The panel approach also helps, though the panel unit root tests have been criticised because they assume cross-sectional independence. All tests used in this analysis have H_0 of non-stationarity (Baltagi 2008: 137–168). Unit root tests on variables were done at 'Level with individual intercept and trend'. The Levin, Lin and Chu (LLC) test and the Breitung t-statistic assume a common unit process for all cross-sections, whereas the Im, Pesaran and Shin (IPS), ADF Fisher and PP Fisher assume individual unit root process for cross-sections. Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality. All the variables used in this paper were stationary.

The results of the robustness tests are summarised in Table 11.

Table 11: Summary of robustness tests

	1	2	3	4	5	6	7
Endogeneity							
Hausman test	Correctly specified	Correctly specified	Correctly specified	Correctly specified	Correctly specified	Correctly specified	Correctly specified
Serial correlation (SC)							
Durbin-Watson	–	–	–	–	–	–	–
Heteroskedasticity							
Test for heteroskedasticity	–	–	–	–	–	–	–
Stationarity	TDR	EVA	MVA	ROE	ROA	WACC	
Levin, Lin and Chu (LLC) test	Stationary	Stationary	Stationary	Stationary	Stationary	Stationary	
Breitung t-stat test	Stationary	Stationary	Stationary	Stationary	Stationary	Stationary	
Im, Pesaran and Shin (IPS) test	Stationary	Stationary	Stationary	Stationary	Stationary	Stationary	
ADF Fisher test	Stationary	Stationary	Stationary	Stationary	Stationary	Stationary	
PP Fisher test	Stationary	Stationary	Stationary	Stationary	Stationary	Stationary	

In an effort to discern whether different groupings of companies in terms of their EVA and MVA performance would lead to differing results, the data were categorised accordingly and the following models were regressed:

Model 1: High SEVA and low SMVA
Model 2: High SEVA and high SMVA
Model 3: Low SEVA and low SMVA
Model 4: Low SEVA and high SMVA.

The regression results are given in Table 12.

Table 12: Regression results

MODEL	1	2	3	4
SEVA	−5710.153 (−1.000354)	2139.830 (0.750853)	2791.966 * (1.782681)	1121.723 (1.227778)
SMVA	−25.65081 ** (−2.273272)	224.9340 *** (2.698345)	−6.511366 (−0.830799)	0.813971 (1.163898)
WACC	480.5623 * (1.769037)	318.1951 (1.337632)	12.13308 (0.057515)	−78.05479 (−0.449670)
C	11219.99 *** (3.276024)	12722.86 *** (4.378172)	8359.168 *** (3.341368)	8130.784 *** (3.742129)
F-statistic (p-value)	0.014004 **	0.009312 ***	0.118556	0.202121
R²	0.099300	0.124490	0.062053	0.049205
Adjusted R²	0.072547	0.093949	0.031131	0.017861

Note: Coefficients reported with t-statistics in parenthesis. Heteroskedasticity has been corrected for.
***, **, * indicate significance at the 1%, 5% and 10% levels respectively.

Table 13: Robustness tests

	Heteroskedasticity	Serial correlation
Group 1	*	No SC
Group 2	*	+ SC
Group 3	*	+ SC
Group 4	*	Inconclusive

* Insufficient observations

From the results in Table 13, it appears that there is a significant link between executive compensation and the MVA of companies with high EVA. The significance of the link between executive remuneration and MVA was stronger for companies with high EVA and high MVA (group 2) than for companies with high EVA and low MVA (group 1). Interestingly, there is no significant link for these companies between executive remuneration and EVA. For the companies with low EVA, no significant links were found between executive remuneration and either EVA or MVA. Although the results were not very conclusive, one could argue that they support Hypothesis 3 by indicating a significant difference in the strength of the relationships as stated for the different categories of companies. It therefore appears as if companies that are successful in generating high EVA take a more forward-looking approach by placing more emphasis on MVA when determining executive compensation.

Conclusions

The results of the study provide evidence that there is a significant relationship between the executive compensation of South African listed companies and measures of financial performance. However, in contrast to the findings of a similar study by Fatemi et al. (2003) based on American companies, this South African study finds that there is a stronger relationship between executive remuneration and the traditional performance measures of ROA and ROE, compared to the relationship between executive remuneration and EVA and MVA.

Furthermore, this study found a stronger relationship between executive compensation and EVA than between executive compensation and MVA. This is also contrary to the findings of Fatemi et al. (2003), who reported that the link between MVA and executive remuneration was stronger than that of EVA. This may be an indication that South African companies are starting to acknowledge EVA in their compensation plans, but have not yet progressed to the long-term view of shareholder wealth creation as represented by MVA. MVA can theoretically be proved to be the present value of all future EVAs that a company is expected to generate.

Another analysis that was done after categorising companies into four groups in terms of EVA and MVA reveals that companies with high EVA have significant relationships between executive remuneration and MVA. For companies with low EVA, no significant links could be found between executive remuneration and either EVA or MVA.

The difference in the findings of the two studies may be attributed to the fact that South African companies place a greater emphasis on traditional measures such as ROA and ROE when compensating executives, while their American counterparts

tend to rely more on EVA and MVA. South African companies also seem to take a short-term view by relying more on EVA than on MVA as benchmarks for executive compensation. From a strategic perspective, there is no question that a forward-looking focus based on shareholder value creation and incorporating risk, as embodied by EVA and MVA, is essential for a sound executive remuneration policy. South African companies are therefore challenged to embrace the concept of shareholder wealth creation in their quest to measure the performance of executives fairly and to remunerate them more appropriately.

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