

**EXPLORING THE CORRELATION BETWEEN SELECTED PERFORMANCE
MEASUREMENT TOOLS FOR INDIVIDUAL INVESTORS IN SOUTH AFRICA**

by

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DECLARATION

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I declare that “***EXPLORING THE CORRELATION BETWEEN SELECTED PERFORMANCE MEASUREMENT TOOLS FOR INDIVIDUAL INVESTORS IN SOUTH AFRICA***” is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

SIGNATURE

Mr Jacques Totowa

DATE : 2015-02-23

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This work is committed to my LORD and Saviour Jesus Christ. As it is written: “Commit thy works unto the LORD, and thy thoughts shall be established!” (Proverbs 16:3).

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ABSTRACT

It is generally acknowledged that the share price of listed companies is not usually a true reflection of the value imbedded in the said companies. The main purpose of this study is to explore the correlation between selected performance measurement tools, namely Return on Equity (ROE) and Economic Value Added (EVA[®]), and the share price of companies listed on the Johannesburg Stock Exchange.

The study is a quantitative one as it uses data extracted from McGregor BFA database to investigate the relationship between the variables studied. Correlation and linear regression analyses were used in determining such relationships.

This study found that there is a synergy in using ROE and EVA[®] as performance measurement tools and that their interaction explains 8.06% of the movement in the share price of listed companies, all things being equal. Hence it is recommended to identify and study possible synergies between other performance measurement tools.

Keywords

Performance measurement tools, individual investors, value creation (destruction), share price, shareholders value, investing, Johannesburg Stock Exchange, Integrated reporting, correlation, Return on Equity, Economic Value Added.

TABLE OF CONTENTS

DECLARATION.....	i
ACKNOWLEDGEMENTS.....	ii
ABSTRACT.....	iii
LIST OF FIGURES.....	ix
LIST OF TABLES.....	x
ABBREVIATIONS AND ACRONYMS USED.....	xi
<u>CHAPTER 1 : INTRODUCTION</u>	<u>1</u>
1.1 BACKGROUND.....	1
1.2 RATIONALE.....	4
1.3 PROBLEM STATEMENT	7
1.4 RESEARCH OBJECTIVES	8
1.5 THESIS STATEMENT	8
1.6 DELINEATIONS AND LIMITATIONS OF THE STUDY	8
1.7 DEFINITION OF TERMS.....	9
1.8 RESEARCH METHODOLOGY.....	10
1.8.1 RESEARCH DESIGN	10
1.8.2 RESEARCH METHOD.....	10
1.8.2.1 <i>THE LITERATURE REVIEW</i>	10
1.8.2.2 <i>EMPIRICAL WORK</i>	11
1.9 ETHICAL CONSIDERATIONS	12
1.10 SIGNIFICANCE OF THE STUDY	12
1.11 CHAPTER OVERVIEW.....	12
<u>CHAPTER 2 : THE STOCK EXCHANGE AND INFORMATION SOURCES OF INVESTORS</u>	<u>14</u>
2.1 INTRODUCTION.....	14
2.2 FACTORS TO BE CONSIDERED BY INDIVIDUAL INVESTORS DURING THEIR DECISION-MAKING PROCESS	14
2.2.1 INVESTING AND INVESTORS EDUCATION	15
2.2.2 POSSIBLE CATALYST OF THE INVESTING DECISION	16
2.3 THE STOCK EXCHANGE: AN OVERVIEW.....	18
2.3.1 BACKGROUND	18

2.3.2	ADVANTAGES OF INVESTING IN A LISTED COMPANY	20
2.3.3	DISADVANTAGES ASSOCIATED WITH INVESTING IN A LISTED COMPANY	20
2.3.4	THE JOHANNESBURG STOCK EXCHANGE	21
2.4	INFORMATION SOURCES FOR INDIVIDUAL INVESTORS	23
2.4.1	TRADITIONAL FINANCIAL STATEMENTS	23
2.4.2	INTEGRATED REPORTING	26
2.4.2.1	<i>Organisation overview and business model</i>	27
2.4.2.2	<i>Operating context including risks and opportunities</i>	28
2.4.2.3	<i>Strategic objectives and strategies to achieve those objectives</i>	28
2.4.2.4	<i>Governance and remuneration</i>	28
2.4.2.5	<i>Performance</i>	29
2.4.2.6	<i>Future Outlook</i>	29
2.4.2.7	<i>Perspectives for individual investors</i>	29
2.4.3	OTHER SOURCES OF POSSIBLE INFORMATION FOR INDIVIDUAL INVESTORS.....	30
2.5	SUMMARY	31

CHAPTER 3 : RETURN ON EQUITY AND ECONOMIC VALUE ADDED® AS

PERFORMANCE MEASUREMENT TOOLS FOR INDIVIDUAL INVESTORS 34

3.1	INTRODUCTION	34
3.2	BACKGROUND.....	34
3.2.1	ACCOUNTING-BASED PERFORMANCE MEASUREMENT TOOLS	34
3.2.2	VALUE-BASED PERFORMANCE MEASUREMENT TOOLS.....	36
3.2.3	ACCOUNTING- VERSUS VALUE-BASED PROFIT.....	39
3.3	RETURN ON EQUITY (ROE).....	40
3.3.1	COMPONENTS OF THE ROE FORMULA.....	44
3.3.1.1	<i>Net profit margin</i>	44
3.3.1.2	<i>Total asset turnover ratio</i>	45
3.3.1.3	<i>Financial leverage multiplier</i>	45
3.3.1.4	<i>Interaction of the three components of ROE</i>	46
3.3.2	ADVANTAGES OF ROE AS A PERFORMANCE MEASUREMENT TOOL.....	46
3.3.3	DISADVANTAGES ASSOCIATED WITH ROE AS A PERFORMANCE MEASUREMENT TOOL....	47
3.3.4	SUSTAINABLE GROWTH RATE (SGR)	48
3.4	EVA® AS A PERFORMANCE MEASUREMENT TOOL FOR INDIVIDUAL INVESTORS	49
3.4.1	WHY EVA®	50
3.4.2	ORIGIN OF EVA®	52

3.4.3 THEORY OF EVA®	53
3.4.4 ADVANTAGES AND DISADVANTAGES OF EVA®	57
3.4.4.1 Advantages	57
3.4.4.2 <i>Disadvantages of EVA® as a performance measurement tool</i>	58
3.5 SUMMARY	59
<u>CHAPTER 4 : METHODOLOGY</u>	<u>62</u>
4.1 INTRODUCTION	62
4.2 RESEARCH DESIGN	63
4.3 THE RESEARCH METHOD	64
4.3.1 SOURCES OF DATA	65
4.3.1.1 <i>Validity</i>	66
4.3.1.2 <i>Reliability</i>	66
4.3.2 DATA	67
4.3.2.1 <i>Research population</i>	67
4.3.2.2 <i>Sampling procedure</i>	68
4.3.3 DATA ANALYSIS AND INTERPRETATION	68
4.4 LIMITATIONS	70
4.5 ETHICAL CONSIDERATIONS	70
4.6 SUMMARY	71
<u>CHAPTER 5 : RESEARCH FINDINGS</u>	<u>72</u>
5.1 INTRODUCTION	72
5.2 DATA ANALYSIS	72
5.2.1 DESCRIPTION OF THE POPULATION	73
5.2.1.1 <i>Adjusted average share price</i>	74
5.2.1.2 <i>Log of the adjusted average share price</i>	76
5.2.1.3 <i>Average ROE</i>	77
5.2.1.4 <i>Log average ROE</i>	78
5.2.1.5 <i>Average EVA®</i>	80
5.2.1.6 <i>Log average EVA®</i>	81
5.2.2 INVESTIGATE THE RELATIONSHIP BETWEEN THE AVERAGE ROE AND THE ADJUSTED AVERAGE SHARE PRICE	82
5.2.3 INVESTIGATE THE RELATIONSHIP BETWEEN AVERAGE EVA® AND ADJUSTED AVERAGE SHARE PRICE	88

5.2.4 INVESTIGATE THE EFFECT OF AVERAGE ROE AND AVERAGE EVA [®] AND THE INTERACTION OF THE TWO ON ADJUSTED AVERAGE SHARE PRICE	92
5.3 SUMMARY	95
<u>CHAPTER 6 : CONCLUSIONS AND RECOMMENDATIONS.....</u>	98
6.1 INTRODUCTION	98
6.2 OVERVIEW OF THE BACKGROUND TO AND FOCUS OF THE STUDY.....	98
6.3 CONCLUSIONS	99
6.4 FINAL COMMENTS.....	104
6.5 LIMITATIONS OF THE STUDY.....	105
6.6 RECOMMENDATIONS.....	105
6.7 SUGGESTIONS FOR FURTHER STUDIES.....	105
<u>REFERENCES</u>	107
APPENDIXES.....	124
Appendix 1: JSE data. ROE & EVA [®] calculations (CD)	
Appendix 2: Inflation rates.	125
Appendix 3: Average share price calculations (CD)	
Appendix 4: Top100- 2010 to 2012.....	126
Appendix 5: WACC steps on McGregor BFA.....	129
Appendix 6: Research ethics approval.....	130

LIST OF FIGURES

Figure 3.1 Diagrammatic illustration of the DuPont system.....	42
Figure 5.1: Histogram and descriptive statistics of the adjusted average share price	75
Figure 5.2: Histogram and descriptive statistics of the Log of the adjusted average Share price.....	76
Figure 5.3: Histogram and descriptive statistics of average ROE	77
Figure 5.4: Histogram and descriptive statistics of Log average ROE	79
Figure 5.5: Histogram and descriptive statistics of average EVA [®]	80
Figure 5.6: Histogram and descriptive statistics of the Log average EVA [®]	81
Figure 5.7: Fit Group. Bivariate Fit of LOG adjusted average share price By LOG average ROE (with outliers)	83
Figure 5.8: Fit Group. Bivariate Fit of LOG adjusted average share price By LOG average ROE (without outlier)	84
Figure 5.9: Fit Group. Bivariate Fit of LOG adjusted average share price By LOG average ROE	85
Figure 5.10: Bivariate Fit of LOG adjusted average Share price By Log average EVA [®] (with outlier).....	88
Figure 5.11: Bivariate Fit of LOG share price adjusted By LOG EVA [®]	89
Figure 5.12: Bivariate Fit of LOG adjusted average share price By LOG average EVA [®]	90
Figure 5.13: Residual by Predicted Plot	95

LIST OF TABLES

Table 5.1: Summary of fit average ROE.....	86
Table 5.2: Analysis of variance average ROE.....	86
Table 5.3: Parameter Estimates Log ROE	87
Table 5.4: Summary of Fit EVA [®]	91
Table 5.5: Analysis of Variance EVA [®]	91
Table 5.6: Parameter Estimates LOG EVA [®]	92
Table 5.7: Summary of Fit ROE and EVA [®]	93
Table 5.8: Analysis of Variance ROE and EVA [®]	93
Table 5.9: Parameter Estimates Log ROE + Log EVA [®]	94

ABBREVIATIONS AND ACRONYMS USED

CFROI	Cash Flow Return on Investment
CVA	Cash Value Added
EBIT	Earnings before Interest and Tax
EVA [®]	Economic Value Added, Registered trade mark
EPS	Earnings per Share
GAAP	Generally Accepted Accounting Principles
GRI	Global Reporting Initiative
IFRS	International Financial Reporting Standards
IIRC	International Integrated Reporting Council
IODSA	Institute of Directors in Southern Africa
JSE	Johannesburg stock Exchange
Log	Natural Logarithm
NOPAT	Net Operating Profit after Tax
R ²	RSquare
ROA	Return on Asset
ROI	Return on Investments
ROE	Return on Equity
SENS	Security Exchange News Services
SGR	Sustainable Growth Rate
SVA	Shareholders Value Added
VBM	Value Based Management
WACC	Weighted Average Cost of Capital

CHAPTER 1 : INTRODUCTION

1.1 BACKGROUND

A financial crisis is described by Gatti (2008) as a built-in defect of the capitalist system. According to Das (2012), as well as Duasa and Ahmad (2010) the financial crisis that began in 2007 in the United States has become the worst of the preceding seven decades. What was initially a local problem in the United States' housing market quickly spread to other parts of the world. One of the reasons for the rapid expansion of this crisis according to Courtois (2012) is the globalisation and technological advances that have turned financial markets into a virtual single market. This interconnectedness has however given investors and the public at large a means to track the performance of worldwide investments on a real-time basis.

Nelson (2000) established that investors are likely to research companies they want to invest in, or in which they are already invested, with the aim of measuring their performance. Measuring the performance of a company is important to investors as it could be used as a guide in their decision-making process (Halir, 2011). Furthermore, according to Kaydos (2014), performance measurement helps answer questions that various stakeholders have about a specific company. Kaydos (2014) contends that measuring performance has been the basis of mankind's evolution, as it has always required a determination of causal relationships between phenomena. Riahi-Belkaoui (2004) states that over history various civilisations have put systems for recording commercial transactions in place, amongst others: the Chaldean-Babylonian, Assyrian and Sumerian civilisations.

Accounting is a language, a communication process and a conveyor of information (Salvary, 2005). Drury (2011) defines accounting as a communication medium for people with an interest in a business organisation. The accounting information is communicated to the public in the form of financial statements. According to Doukakis (2010), one of the main purposes of financial statements is to assist users in improving their estimate of value of a company. Accounting standards therefore

play a central role in the preparation of such statements as they contribute to giving investors information that is relevant and reliable (Chalmers, Navissi & Qu, 2010).

According to the International Financial Reporting Standard Foundation (IFRS Foundation, 2012), understandability, relevance, materiality, substance over form, neutrality, prudence, faithful representation, completeness and reliability are qualitative characteristics that information in financial statements should possess. The IFRS Foundation (2012) also emphasises that comparability, verifiability, and timeliness represent characteristics that could further enhance the value of information in financial statements.

In terms of the Companies Act 71 of 2008, South African companies are required to file a set of audited financial statements on a periodic basis with regulatory authorities (South Africa, 2008). The information in these financial statements, combined with management's regular communication with its shareholders (Institute of Directors in Southern Africa (IODSA), 2009), could be used by investors as the basis for their evaluation of the performance of a company.

Furthermore as a direct consequence of the 2007 economic crisis (Deloitte & Touche, 2012), companies and regulatory authorities are being put under pressure, from various quarters, to increase the quantity and quality of information provided to the public (Jianu, 2012). Integrated reporting appears to be a possible solution for the provision of more information to the public (Eccles, Serafeim & Armbrester 2012). This is because it goes beyond the conventional financial statements by providing a greater context for a company's performance (Eccles et al, 2012).

The need for more information is further compounded by the fact that in a modern economy, most shareholders do not manage the companies in which they invest in. Firer, Ross, Westerfield and Jordan (2008) are of the view that the shareholders are the ultimate owners of the company. The task of running a company is however the responsibility of a management team, whose duty it is to maximise the wealth of the shareholders (Gitman & Zutter, 2012). The agency theory provides a mechanism for

shareholders to ensure that management run companies for the benefit of all concerned (Bender & Ward, 2009). Correia, Flynn, Uliana and Wormald (2011) are of the view that in an agency relationship, the manager is the representative of the investor and is therefore supposed to perform his or her duties in a way that will maximise the value of the investment made and ultimately enhance the wealth of the investor.

The management of companies are supposed to be better placed to know what is going on in their companies (Chalmers et al, 2010). A potential conflict could however arise between investors and management, which may be because the interests of the two groups are, not always aligned (Nyberg, Fulmer, Gerhart & Carpenter, 2010).

Kaplan and Norton (2001) however expressed the view that it is important for management to establish how their performance is viewed by investors. For Kennerley and Neely (2003) performance measurement should be adapted to specific circumstances of a company for it to be relevant to the user. Measuring a company's performance should not be the end in itself (Behn, 2003). Based on the discussion above, it could be said that performance measurement ultimately enhances the wealth of the investors while at the same time caters for information needs of other stakeholders of a company which include investors.

The assumption in capital market theory about the Efficient Market Hypothesis is that the share price immediately reflects all available information (Bukh & Nielsen, 2011). It is however also noted that there seems to be evidence suggesting that the role of accounting information in explaining the movement in share price has been declining (Brown, Lo & Lys, 1999). Concerns have also been raised about the apparent differences between the share price and possible company value (Fontevicchia, 2012). The gap between share price and the book value of companies seems to be increasing (Abuzayed, Molyneux & Al-Fayoumi, 2009). In a study investigating the relationship between share price and the success of a company, Reiman (1987) found that gains on the market of goods and services seemed not to translate automatically into gains on the stock exchange. It appears, therefore, that there is a

disconnect between the accounting value and the share price of companies (Abuzayed et al, 2009), Abuzayed et al (2009) further suggest that share price could not reasonably purport to represent internal value of a company.

A study by Rappaport (1983) showed that company executives argue that the share price is not a true reflection of the value of their companies. Because the nature of investors is to be risk averse (Hussainey, Mgbame & Chijoke-Mgbame, 2011), it could be asserted that misreading of the performance of a company could lead to an investor prematurely divesting or staying invested in a company that is facing difficulties. There is an increase in the number of individuals who self-manage their wealth, so they do research and make their own investment decisions (Sutherland, 2007). Sutherland (2007) argues that this has heightened the need for tools that could help them screen companies on their financial performance and corporate governance.

From the above discussions, it is evident that accounting performance information provided in financial statements is a valuable source of information to investors in general as well as to individual investors. This information is however no longer sufficient as the only source to base investment decisions on. This is because a gap appears to exist between the book value of companies and the share price. It would therefore appear that when evaluating a company's performance, individual investors would need to consider using additional information to assist them in their decision-making process.

1.2 RATIONALE

The South African Government through the Financial Sector Code for Black Economic Empowerment (2012) has been encouraging greater participation of all sectors of the population in financial markets. This, combined with a growing middle class (Kharas, 2010) that may have enough savings to invest in JSE listed companies, could increase the pool of individuals willing to invest their savings on the JSE. It is therefore argued that individual investors may need to have a better

understanding of the sources of available information and the workings of a stock exchange and how to evaluate the performance of companies listed on it.

According to Barr (2014), the question has always been about what was the most effective performance measurement tool. The concern of Barr is topical, especially in the accounting field where there seems to be a multitude of competing tools that are deemed by their sponsors to be a panacea for those who want to know the performance of a company. In this regard, various studies have made a distinction between what they term “traditional performance measurement tools” and value-based performance measurement tools.

Examples of traditional performance measurement tools, also referred to as accounting-based performance measurements, are amongst others Net Operating Profit after Tax (NOPAT), Earnings per Share (EPS), Return on Assets (ROA), Return on Investment (ROI) or Return On Equity (ROE) (Rappaport 1983; De Wet 2005). However studies on value-based performance measurement tools are mainly on Economic Value Added (EVA[®]) (Sharma & Kumar 2010; Kumar & Sharma 2011). The distinction is made on the basis that traditional performance measurement tools are earning-based (Reiman, 1987) whereas value-based performance measurement tools are based on the concept of shareholders value creation (Athanasakos, 2007). In both cases the intention is to ultimately give investors a measure of the value of their investment in a company. A new approach to the debate surrounding the superiority of EVA[®] versus accounting-based performance measurement tools is evident in the study by Van der Poll, et al (2011). They suggested that a better understanding of EVA[®] combined with other metrics could improve its use in the case of South Africa This study therefore identifies an accounting-based and a value-based performance measurement tool that could be useful to individual investors in their decision-making process.

While analysing operating performance measurement tools, Reilly and Brown (2012) emphasised the importance of ROE to investors. According to them, ROE indicates

the return generated by a company with funds provided by investors. It is the amount of net income returned as a percentage of shareholders equity (Ahsan, 2012). Simply put, ROE is the return that a company generates from the investors' money (Maditinos, Sevic & Theriou, 2009). For De Wet and Du Toit (2006) ROE can be considered one of the performance measurement tools used the most by investors. Reilly and Brown (2012) argued that the continuous use of ROE is justified because it reflects a company's overall risk and it also reflects an investor's financial risk. Further, ROE is the most appropriate accounting measure to give investors the return on the risk they have taken by investing (Ward & Price, 2006). Based on the discussion above, ROE could be considered a tool directly aimed at investors since the concept of equity refers to the right investors have in a company. This justifies the choice made to use ROE as the accounting-based performance measurement tool for this study.

EVA[®] represents the intrinsic value of a company, defined by Buffett (1998) as the discounted value of the cash that can be taken out of a company for the rest of its life. While studying the relationship between the market value of a company and internal performance measures, Hall and Brummer (1999) listed up to 28 internal variables that correlate individually at various degrees with the share price of a company. Hall and Brummer (1999) found that EVA[®] correlated better to the share price than any of the other 27 variables, amongst them ROE, ROA and EPS. Sharma and Kumar (2010) had a similar conclusion in their review of the literature on EVA[®], when they confirmed the superiority of EVA[®] compared to other performance measurement tools. There are also studies by authors such as Al-Mamun and Mansor (2012) that recommended the use of EVA[®] to Malaysian companies as it was considered to be a superior performance measurement tool. Leong, Pagani and Zaima (2009) while investigating whether a portfolio created using EVA[®] gave better returns, came more or less to the same conclusions.

Other authors have however criticised EVA[®] for not being any different to other performance measures. Studies done on EVA[®] by, Dodd and Chen (1996) as well as Biddle, Bowen and Wallace (1999) found that although EVA[®] encourages shareholder value creation practices in a company, it was not any different to known

performance measurement tools. Kramer and Pushners (1997), on testing the strength of the relationship between EVA[®] and the market value added, have not found EVA[®] to be superior to traditional performance measurement tools such as ROE. All the studies mentioned above seem to be comparative in nature as they seek to determine one performance measure that demonstrates a better correlation to the share price of listed companies than the other.

In support of the decision to select ROE and EVA[®] for this study, Hall and Brummer (1999), argue that even though there is overwhelming evidence in the international academic community of the superiority of EVA[®] compared to traditional performance measurement tools, this has not discouraged investors and managers in South Africa from continuing to use accounting-based performance measurements tool in determining the value created, or destroyed, by a company listed on the Johannesburg Stock Exchange (JSE).

1.3 PROBLEM STATEMENT

In Section 1.1 the usefulness of measuring a company's performance was discussed. A discussion on the relevance of ROE and EVA[®] was further conducted in Section 1.2, justifying their use as accounting-based and value-based performance measurement tools for this study. In the same discussions it was established that a disconnect existed between the share price of listed companies and their book value. That is a problem as the said disconnect could lead investors to misread the performance of a listed company. This is the gap in the literature that this study therefore proposes to contribute towards.

1.4 RESEARCH OBJECTIVES

The aim of this study is to explore if the interaction of ROE and EVA[®] could provide additional benefits to individual investors when evaluating an investee or a potential investee.

The objectives of the study are to:

- Identify individual investors' sources of information, when assessing JSE listed companies.
- Investigate the concepts of ROE and EVA[®] as performance measurement tools for individual investors when making JSE investee decisions.
- Explore with the help of a statistical construct, whether knowledge of the interaction of a company's ROE and EVA[®] could form a better basis for individual investors in making decisions on investments on JSE listed companies, than either of the two metrics standing alone.

1.5 THESIS STATEMENT

Companies communicate with the public through periodic reporting, updates and press releases. It is argued in this study that knowledge of the interaction of a company's ROE and EVA[®] could assist individual investors in having a better understanding of a company's performance and inform better decision-making on their side.

1.6 DELINEATIONS AND LIMITATIONS OF THE STUDY

Companies share price could be influenced by a variety of factors such as: investors' sentiment, macro-economic policies, energy provision in a country or even the approval rating of a head of state amongst others. In the meantime company performance measurement literature identifies various metrics that could be used by investors and other stakeholders as an aid in their decision-making process. This

study while acknowledging that there are many factors that investors should consider when evaluating an investee, is only limited to the benefits the interaction of ROE and EVA[®] could bring to individual investors. This is because all factors that could influence or correlate to the share price of a company cannot reasonably be investigated in a study of this nature. Furthermore:

- This study is limited to companies listed on the JSE (JSE, 2012), as it is believed that the stringent listing regulations make their financial reporting more rigorous than companies that do not have the same reporting obligations.
- The focus of this study is on individual investors.
- No confidential information will be used, as access to non-public information could expose investors to insider-trading litigations.
- This study is limited to long-term investors and excludes speculators.
- For the purpose of this study only the companies listed on the Top100 board of the JSE will be studied.
- One of the limitations of this study is that it is based on companies from different industries; it is therefore possible that industry-specific elements that could have had an influence on results of this study have been ignored.

1.7 DEFINITION OF TERMS

Shareholder value: is defined by Makelainen (1998) as a new thinking pattern that prioritises the interests of company's shareholders. It is what an investor could get back from a company as a consequence of his or her investment; it could be in a form of: capital gain, dividend payments, proceeds from share buyback schemes or other payments that could be received from a company. The above definition implies that the managerial ability of a company management have a bearing on a shareholders value.

Value creation (destruction): this is the increase (decrease) of discounted future cash flows (Bender & Ward, 2009).

Share price: this refers to the cost of the purchase of equity shares in a company. Financial theory postulates that the share price is the present value of future dividends and the present value of future prices (Wuite, 2009).

1.8 RESEARCH METHODOLOGY

1.8.1 Research design

The research design for this study is quantitative in nature. A correlation analysis will be conducted on the data in order to assess whether a relationship exists between the variables to be studied (Hofstee, 2006). No further discussion on the research design will be conducted at this stage as a comprehensive discussion will be done in Section 4.2.

1.8.2 Research method

For the purpose of this study a literature review and an empirical study will be undertaken:

1.8.2.1 The literature review

Below is an overview of the literature review that will be conducted:

- The focus of the literature review will be on the usefulness of the stock exchange for investors, the information sources of investors and ROE and EVA[®] as performance measurement tools which could have an influence on an investors' decision-making process.
- The literature review will also seek to determine what other authors' opinions are in relation to possible assistance individual investors could get from available sources of information and of selected accounting performance measurement tools and how these tools could contribute to more informed decisions. Scholarly articles, text books, thesis, transcripts from conference proceedings amongst other will be reviewed for this purpose. The Unisa

library will be the main supplier of books, journals and other resources needed for this study. The internet and websites such as Google Scholar will also widely be consulted.

1.8.2.2 *Empirical work*

Below is an overview of the empirical work that will be executed, a comprehensive discussion on this topic will be conducted in chapter 4.

- As stated above, the empirical study will be quantitative in nature, using the historical financial information available from the McGregor Bureau of Financial Analysis (BFA) database accessed from the Unisa library. The study will first try to determine average ROE and average EVA[®] for the sampled companies for the chosen periods, 2010 to 2012, compare the results with the yearly inflation adjusted average share price of those companies and then determine whether investors could benefit from the effect of the interaction between the two tools. A statistical model using the SAS JMP version 11 software will be constructed to perform all the tasks.
- The Top100 companies on the JSE are chosen because the JSE has a set of rules that companies listed on its board are to abide by. The Top100 ranking is based on market capitalisation, size and potential to attract more investors. It could be assumed that their accounting teams are more likely to have the staffing capacity to produce accounting reports that could be useful for this study.
- The data used will be from the public submissions to the JSE and all publicly available information, as it is believed that all the needed tools could be derived from publicly available information.
- Microsoft Excel will be used to analyse the data collected.

1.9 ETHICAL CONSIDERATIONS

Ethical principles in the Belmont report as summarised by Visagie (2012) will be applied where necessary. No company will be targeted because it may be perceived to be vulnerable, and companies that could benefit from research participation will not systematically be excluded. It is not anticipated that participations in the research will negatively affect participating companies; however the result of the study could benefit society. Further all policies of Unisa pertaining to a study of this nature will be adhered to. Therefore ethical approval, referenced, Ref#: 2014_CAS_0013, has been sought and obtained from Unisa.

1.10 SIGNIFICANCE OF THE STUDY

This study is specific in the sense that it juxtaposes an accounting-based performance measurement tool in the form of ROE and a value-based performance measurement tool in the form of EVA[®], thereby giving two perspectives with which an individual investor could evaluate a company.

1.11 CHAPTER OVERVIEW

Chapter 1 has provided the background to the study, as well as the rational, problem statement and research objectives. The research statement has been introduced and the delineations and limitations of the study were presented. In addition, the methodology that will be used in this study was discussed and the significance of the study has been highlighted.

Chapter 2 will present the literature review, which focuses on presenting the role that stock exchanges play within the investment community and discusses the information sources of investors.

Chapter 3 will investigate the concepts of Return on Equity (ROE) and Economic Value Added (EVA[®]) as performance measurement tools for individual investors in their decision-making process on JSE listed companies.

Chapter 4 will discuss the research design and the research methodology thereafter the limitation of this study and ethical considerations will be acknowledged.

Chapter 5 will present the research findings.

Chapter 6 will provide the conclusions of this study, an overview of the focus of th study will be presented followed by the final comments and the limitations of the study. Recommendations and the identification of possible areas for future research will close this chapter.

CHAPTER 2 : THE STOCK EXCHANGE AND INFORMATION SOURCES OF INVESTORS

2.1 INTRODUCTION

The focus of this study is to determine whether the interaction between ROE and EVA[®] could assist individual investors come to better decisions compared to decisions made based on the two metrics individually. It is recognised in this study that company performance measurement literature contains a multitude of performance measurement tools that are invariably presented as a panacea for investors wanting to know the performance of a company.

However, it is also recognised that for individual investors to use any tool, they need to have a certain understanding of the workings of the stock exchange and at the same time have access to quality data for their evaluation. The sources of information on companies and the credibility of those sources therefore become important for individual investors. Hence identifying individual investor's sources of information when assessing JSE listed companies will be the focus of this chapter. This chapter will present firstly the factors that individuals might consider when trying to invest in a listed company, thereafter the origin and the purpose of the stock exchange to the investing community will be explored and lastly a discussion will be conducted on the possible information sources for investors.

2.2 FACTORS TO BE CONSIDERED BY INDIVIDUAL INVESTORS DURING THEIR DECISION-MAKING PROCESS

It is common to hear commentators or even politicians advise the public to save some of their money in anticipation of days of hardships. Investing in shares listed on a stock exchange has always been touted as one of the possible ways that individuals could use to grow their savings. In the following subsection a discussion on investing and investors education will be conducted followed by a discussion on the possible catalysts of the investing decision.

2.2.1 Investing and investors education

Investing is the allocation of resources, monetary or otherwise, towards a venture for a specific time period, with the hope that it could generate revenue or profit therefore compensating the investor in terms of the time the resources are committed, the inflation during the period of investment and the risk taken (Reilly & Brown, 2012). According to Makelainen (1998), financial theory backs-up the wealth enhancement objective of a company. This is because as explained by Brigham and Ehrhardt (2011), investors buy shares in companies with the hope of earning a good return with little or no risk.

Stewart (1991) contends that the recompense to an individual for investing is the total return generated from such investment; possibly cash, other cash equivalent or investment appreciation. On the other hand there are risks in investing that Stewart (1991) terms “the variability on expected return”. Investors should therefore consider potential risks when deciding to invest in a company. Risk is defined by the BusinessDictionary website as the possibility that an investor will not achieve the expected return on his investment (Luthra, 2014). The above dictionary lists a number of categories that risks could fall under: basic risk, capital risk, country risk, default risk, delivery risk, economic risk, exchange rate risk, interest rate risk, liquidity risk, operations risk, payment system risk, political risk, refinancing risk, reinvestment risk, settlement risk, sovereign risk and underwriting risk. Although academic research has documented the fact that risks and rewards always go concurrently (Stewart, 1991), this study will not further probe the subject as it is focused on benefits individual investors could gain from using ROE and EVA[®] as performance measurement tools.

Bistrova and Lace (2012) argue that companies are built to provide maximum return to investors, however investors are faced with a challenge as they will have to make a decision whether to receive benefits from their investment in the short term, in the form of dividend, or wait to have a potential higher benefit in the future in the form of

capital appreciation. For Giorgi (2011) investors could only determine if their investment strategy has worked at the end of the time period they have fixed for themselves. This is because returns on investments done in listed companies are time-dependant (Maharaj, Galagedera & Dark, 2011).

In a study by Tsai (2013) on the role information plays in investor's choice on a Taiwanese stock exchange, it was found that investors with additional information gain more financially than those with minimal information. Aduda, Oduor and Onwonga (2012) concur with Tsai when they stated that availability of good public information could encourage investors to invest in a particular company. Hassan et al (2011) expressed the view that the less information is disclosed by a company the riskier that company will be. It therefore seems imperative to provide more and reliable information to individual investors as this could contribute to their education as investors, which will in turn lead to households not becoming victims of pyramid scams or other Ponzi schemes (Pellinen et al, 2011).

The usefulness of education in investing is confirmed in a study by Heshmat (2012) who found that the more educated an individual is, the more likely they will invest in a listed company. Wu, Lan and Lee (2013), in a study investigating the ranking of public companies as published by various institutions, found that the ranking sometimes influences investors when making investment decisions. The emphasis on education in the preceding discussion could mean that investing in shares listed on a stock exchange is for the elite, as they are more likely to combine the education and resources necessary for that end.

2.2.2 Possible catalyst of the investing decision

Investors are faced with the problem of identifying where to invest, in the face of competing investment options (Mittal & Aggarwal, 2012). Mittal and Aggarwal (2012) identified in the case of India such things as: saving for retirement, education, paying off loans amongst reasons why an individual could have decided to invest his

savings. They further suggest that the investment decision is not taken in isolation of social pressures such as: age of the investor, their occupation, market conditions amongst other. For Bennet, Selvam and Ebenezer (2011), the investing decision could be influenced by an individual's behaviour but also other motives such as the prospect of receiving dividends, the expectation of getting rich quick or the influence of people who have been successful with the same investment in the past. Ullah, Kabir and Ahmmed (2012) cite the need for self-dependency, upgrading of one's social status, the possibility of earning higher returns compared to another investment avenue and the ease of participation as other reasons that could also encourage individuals to get involved with listed companies.

A study by Aspara and Tikkanen (2010) found that sometimes individuals do not invest in companies based on the risk and return equation, but rather on emotional attachment to a specific company or brand. Further, issues relating to sustainability, environment, employee and customer satisfaction are also being mentioned as possible motivating factors for people to invest (Bistrova & Lance, 2012). However investors are assumed to conduct research when choosing a company in which to invest (Yu, Fuller & Didia, 2012). The premise of this study is that individual investors will, amongst other things, try to inform themselves about a company's management assessment of its value, as reflected by the ROE, and the intrinsic value of a company as represented by EVA[®] when making decisions on a specific company.

Ullah et al (2012) recommend that individual investors should take the following points into consideration when deciding to invest in a listed company:

- An investee or a potential investee should be studied so as to assess the underlying strength of the company.
- The decision to invest should be a culmination of a careful research process
- Investors should refrain from investing on the basis of rumour but should have a long term view of their investment.
- Investors should seek to continually educate themselves on matters of economy and finance.

- Investors should be prepared to make losses and exercise patience regarding their investment.

Therefore more information may be preferable to less as this would reduce uncertainty for investors. The discussion above has highlighted motives of investors but also the importance of time considerations in the investing decision. It could be asserted that amongst others, the stock exchange could provide information about listed companies that may be useful to individual investors. In the next subsection a discussion on the stock exchange will be conducted.

2.3 THE STOCK EXCHANGE: AN OVERVIEW

2.3.1 Background

Countries around the world seem to have a stock exchange as part of the structure of their economies. A Stock Exchange is a crucial part of the capitalist system as it serves as a middleman between people with surplus capital and those in need of it (Ullah et al, 2012). Abbad (2012) traces the origin of the Stock Exchange concept to the 5th century BC with the Romans. The London Stock Exchange is believed to be the oldest in modern history as it dates back 1698; it was created as an answer to the economic needs of the time (Smith: 1929 and Banner: 1998).

According to Goodison (1983), a Stock Exchange is a market in savings, and its main purpose is to facilitate the exchange of security between buyers and sellers. Maree (2001) agrees with Goodison and adds that the prices of the traded securities are influenced not only by basic economic principles such as supply and demand, but also by other factors such as investors' sentiments. However investors' view of a share could also be influenced by, amongst others, a company's product line, a company's market share, the competitive environment of the company or the overall economic environment (Maree, 2001).

A Stock Exchange is a corporate entity specialised in the trading of securities listed on its board according to rules agreed to by its members (Akrani, 2010). It operates

as a clearing house for each transaction where shares are collected and delivered, and payment is collected on behalf of the seller (Akrani, 2010). Booth, Cleary and Drake (2014) state that referring to stock exchanges as auctions is common because the process in a stock exchange involves a bidding process by market participants at a certain location. With increasing technological advancement, a stock market is becoming more and more a virtual market as sellers and buyers could be located anywhere in the world (Almujamed, Fifield & Power, 2013).

Musonera (2008) is of the view that one of the reasons for the existence of the stock exchange as an institution is to provide a trading platform for companies' securities to market participants. Akrani (2010) lists below the main purposes of a stock exchange, it:

- Acts as a market for securities.
- Serves as a regulating authority for the trade in securities.
- Makes sure that only listed securities are traded.
- Makes sure that transactions could only be effected through members.
- Enforces the operating rules of the stock market.

Booth et al (2014) are of the view that the stock exchange helps to direct resources from investors to those in need of them. They further contend that in a case of an efficient market, those resources will automatically be directed to the people with the most productive need for them. Van Wyk, Botha and Goodspeed (2012) distinguished two types of stock exchanges, namely order driven and quote driven. Order driven exchanges are characterised by the fact that buyers and sellers of securities are not able to trade among themselves but under the intermediation of dealers. This is in contrast with quote driven exchanges where investors determine the price of securities (Charitou & Panayides, 2009).

Stock exchange participants could be, amongst others, issuers, investment-banks, venture capitalists, individual investors, and institutional investors such as pension funds, banks, insurance companies, hedge funds, and other companies (Van Wyk et al, 2012). As stated in Section 1.3, this study is aimed at helping individual investors

as they go about trying to measure the performance of an investee or a potential investee listed on the JSE.

2.3.2 Advantages of investing in a listed company

The main advantage for an individual to invest in a listed company is that the stock exchange creates investment opportunities for individual investors as it does not require a big outlay of resources (Musonera, 2008). Anybody could therefore invest according to his capacity. It could also provide an additional source of income for people with small savings (Musonera, 2008). For Amadeo (2013), individual investors have the opportunity of earning dividends while they see their capital appreciate. Further, because stock exchange returns have historically been above inflation, it is better for individual investors when compared to interest on bank deposits that are, most of the time, below the inflation rate.

As discussed in Section 2.3.1, above, it could further be asserted that investing on a regulated platform such as a stock exchange, gives individual investors the peace of mind of knowing that they are placing their hard earned saving with reputable institutions and that the exchange rules could protect them in case of dispute.

2.3.3 Disadvantages associated with investing in a listed company

According to Buffett (1998), investors should not consider themselves as mere owners of a share certificate but as partners in a company in which they are invested in. The main risk of investing in a stock exchange is that one may lose a part or all the money invested (JSE, 2013). It is therefore advised that individuals should only invest money they do not need immediately or that they can afford to lose.

The other possible challenge with investing in a stock exchange is to receive gains that are below one's expectations (JSE, 2013). Konde (2006) concurs with the views

above when he states that the risk of a company collapsing and the investors losing all their investment is real when investing in a listed company. For Konde, the mitigating factor is the higher return that could be earned.

2.3.4 The Johannesburg Stock Exchange

In South Africa the Johannesburg stock exchange is licensed to operate a stock exchange in the country (JSE, 2013). The JSE was established in 1887 as a means to help the then burgeoning mining industry to raise capital (Yartey, 2008). However the first legislation applicable to the JSE, the Stock Exchange Control Act, was only enacted in 1947 (JSE, 2013). Since then, the JSE has gone through a number of transformations with the view to modernising it and improving its efficiency. This culminated in amendments to the act that demutualised the JSE in 2005 after 118 years of existence as a mutual (Yartey, 2008). The transformation of the JSE is also illustrated by the adaptation of technology to put it on par with its counterparts around the world (JSE, 2013). Loubser (2010) added that technology enhanced the JSE capabilities in performing some of its duties such as, real-time monitoring of market participants activities, record keeping of market activities and provision of a platform for market surveillance. Rono (2013) agrees with Loubser above when she states that the introduction of modern technology on the JSE has improved market integrity. All of these changes were done with the aim of increasing the JSE competitiveness and its attractiveness to investors (JSE, 2013).

As part of its objective to attract more investors, the JSE has undertaken to provide basic training for individuals that intend to participate in the market. It has also gone on a drive to interest younger people on the benefit of saving through trading on the stock exchange by hosting trading competitions directed to schools and university students (JSE, 2013). Further, it has for example uploaded investing for beginners courses for free on its website, with the aim of demystifying the stock exchange investment for the novice (JSE, 2013).

The operating mandate of the JSE is to be run in the public interest (Loubser, 2010). The JSE, as a regulator of its members, therefore has a comprehensive listing requirement for companies aiming to list or already listed on its boards. These listing requirements add to the credibility of the exchange as they aim to guarantee the integrity of the trading process (Yartey, 2008). Below is the list of objectives that the JSE listing requirements aim to achieve (JSE, 2013):

- The existence of a capital market for the raising of primary capital; an efficient mechanism for the trading of securities in the secondary market; and the protection of investors.
- To ensure that listed securities comply with the JSE listing requirements.
- To ensure that all price sensitive information is made available to the market participants and the public at large in real time.
- To ensure that holders of securities are fully informed on changes in the issuing companies that could affect their holdings and that the information is timely enough to afford them the time to make informed decisions.
- To ensure that information dissemination to the market or public is done responsibly.
- To ensure that there is no discrimination amongst holders of the same class of security.
- To ensure that through its listing requirements, the JSE promotes investor confidence.

It could therefore be asserted that the JSE provides to investors a sound and secure platform for them to trade in securities that are listed on its boards. This provides investors with the assurance that the JSE is a credible institution that compares well with similar institutions around the world and that their savings will be protected. Further, the JSE act gives it the powers to enforce its rules on its members, adding to the credibility of the JSE as an institution (JSE, 2013). The discussion in this section has presented the stock exchange and the benefits it could provide to individual investors. In Section 2.4 below, a discussion on possible information sources for individual investors will be undertaken.

2.4 INFORMATION SOURCES FOR INDIVIDUAL INVESTORS

To evaluate the performance of a company, investors need credible sources of information on which the evaluation could be based (Tsai, 2013). The following subsections will discuss possible sources of information for individual investors starting with traditional financial statements, followed by integrated reporting and ending with other possible sources of information for individual investors.

2.4.1 Traditional financial statements

Traditionally, financial statements were considered the primary source of information concerning a company. According to the International Financial Reporting Standard (IFRS Foundation, 2012), financial statements are an illustration of the financial position and performance of a company. The purpose is therefore the provision of information that could assist a wide range of stakeholders in making economic decisions based on those statements (IFRS Foundation, 2012). Investors and other stakeholders make use of information in financial statements to assess the current and future performance of a company (West & Worthington, 2001).

Listed companies are compelled by the Companies Act 71 of 2008 and the JSE listing requirements to submit audited financial statements to the JSE and any other relevant authorities at regular intervals (South Africa, 2008). The production of these financial statements is required to comply with the International Financial Reporting Standards (JSE, 2013). According to the IFRS Foundation (2012), financial statements should include:

- **Statement of financial position:** represents a view of a company at a point in time, showing a company's assets, its liabilities and the difference of the two representing what belongs to equity holders (Firer et al, 2008). The IFRS foundation (2012) prescribes the minimum content of the statement of financial position. According to Huang and Zhang (2012) the statement of

financial position is a crucial part of the overall financial report as it gives investors an indication of the origin and the uses of a company's resources. It also provides information that could be useful in the valuation of a company.

- **Statement of comprehensive income:** measures a company's performance over a period, by expressing the profit value as the difference between revenue and expenses for a period (Firer et al, 2008). Ross, Westerfield and Jaffe (2010) compare the statement of comprehensive income to a video recording that presents what has happened over a period. Its purpose is to list all elements that increase or diminish the wealth of a company (Vernimmen et al, 2011). The IFRS foundation (2012) prescribes the content and the possible formats that this statement should take.
- **Statement of cash flow:** is the difference between what amounts of cash effectively left the company compared to what came in (Firer et al, 2008). For Drury (2011), all investment decisions should be done on the basis that cash will flow to investors as a consequence. Paquin (1987) argues that a distinction between cash inflow and cash outflow is necessary, and that investors should strive to earn more on cash paid and pay less on cash received as a prudent banker would do. According to the IFRS foundation (2012), the cash flow provides users of financial statements with an assessment of a company's ability to generate cash and cash equivalents and shows how a company uses the cash flows at its disposal. Because judgement is an essential element in the compiling of financial statements, the statement of cash flow eliminates the judgment variable by tracking the movement of actual cash in a company during a period (Booth et al, 2014). The IFRS foundation (2012) prescribes that the cash flow statement reports cash flow in terms of operation, investment and financing for a period.
- **Statement of changes in equity:** is a reconciliation of equity at the start of a period with equity at the end of the period (Koppeschaar et al, 2012). This may be useful to individual investors as it shows the capital structure of a company.
- **Explanatory notes:** provide additional information that might help in the better understanding of financial statements. This information should be

cross-referenced to the other financial statements (Koppeschaar et al 2012:58).

In a study by Al-Ajmi (2009) on an investor's use of financial statements in Bahrain, it was found that individual investors consider financial statements to be the most important source of information on companies. Hussainey (2009) suggests that financial statements are useful because they provide information, to investors that could be useful in assessing the past performance of a company and could be an indicator of future profitability of a company.

However the collapse of companies such as ENRON in the US and the financial crisis that started in 2007 has made readers change their expectations of financial statements (Booth et al, 2014). It is also claimed that changes in the global economy and the increased sophistication of investors has rendered information in ordinary financial statements inadequate in satisfying investors (Madinios et al, 2009). This is because financial statements seem not to be adapted to the new competitive environment of a company (Kennerley & Neely, 2003). Consequently, pressure is being exerted on the accounting profession to improve the quality of information that is released to the public (Jianu, 2012). Further, there is an increased demand from authorities for innovative mechanisms that will improve the quality of company reports (Onumah, Kuipo & Obeng, 2012).

Further criticism of current financial reporting is the perception that it is low in quality and irrelevant (Biddle, Bowen & Wallace, 1997). Integrated reporting has been identified as a possible answer to the need for the supply of more information by companies (Institute of Directors in Southern Africa (IODSA), 2009; Eccles et al, 2012). The subsection below will discuss integrated reporting as a possible source of information for individual investors.

2.4.2 Integrated reporting

According to the United Nations Brundtland commission (The Brundtland Report 1987), sustainability can be defined as a way of doing business that helps current generations meet their needs while not compromising the ability of future generations to meet theirs. Concerns over questions of business sustainability could be traced back to 1920 when Wallace B. Donham stressed the need for socially responsible business people (Dumitru et al, 2013). For Figge and Hahn (2004), a sustainable company can only be assessed on its economic, environmental and social results. Wingard and Vorster (2001) are of the view that there is a positive correlation between environmental responsibility and financial success of a company. A report explaining how a company fares in terms of its sustainability could therefore be useful in assessing that fact.

According to Druckman (2013), reporting on a company's sustainability could be considered one of the major innovations in terms of company reporting. However combining conventional financial information with key sustainability indicators could be more useful to investors (Rossouw, 2013). Integrated reporting therefore seems to be the instrument a company could use to answer the demand of the new business context (Kosovic & Patel, 2013).

The changes in the business environment in the past few decades have warranted companies to change the way they communicate with the public. The International Integrated Reporting Council (IIRC) is a global body comprising stakeholders with an interest in the information content of companies' reports (Ioana & Adriana 2013). The IIRC is of the view that a company's reporting needs to move from its current state, to a more comprehensive communication about how strategy, governance, performance and outlook in the context of a company's external environment leads to value creation over the short, medium, and long term (IIRC, 2013).

For the Global Reporting Initiative (GRI, 2012) integrated reporting should include:

- Strategy and profile; meaning information that contextualises the operating environment of a company such as its strategy, profile and governance.

- Management approach; that is information to help in understanding management's approach to challenges that it faces, so as to help investors and other stakeholders to contextualise the company's results.
- Performance indicators; that is information relating to performance and how it compares with standard sets, and also with peers and societal expectations.

According to the King III reports, companies should, over and above their financial performance disclosure requirements, present an integrated report that could explain how a company has performed (IODSA, 2009). Eccles et al (2012) concurred with the above and suggested that this could be done by publishing information in an integrated report, that could put financial performance of a company in context by describing the operational environment of a company and strategies put in place to mitigate any related risk. The IODSA (2009) is of the view that these additional disclosures of financial and non-financial information could enhance the usefulness of company reports and by extension, the confidence investors have in them.

Integrated reports should discuss not only strategies, targets and competencies, but also key performance indicators and key risk indicators (Eccles et al, 2012). According to Mertins, Kohl and Orth (2012), the following elements should form part of an integrated report: organisation overview and business model; operating context including risks and opportunities; strategic objectives and strategies to achieve those objectives; governance and remuneration; performance; and future outlook. Below is a brief discussion of each element.

2.4.2.1 Organisation overview and business model

IIRC (2013) proposes that a company should give an overview of its internal social dynamics. For this to be done, it is proposed that a company should disclose its mission and vision, but also its culture, ethics and value, ownership structure, principal activity and competitive landscape. Elements of the external environment such as legal, commercial, and socio-political aspects that could influence the value

creation ability of a company also need to be part of the integrated report. Disclosure of elements that could help a reader to better understand the business model of a company is also required (IIRC, 2013).

2.4.2.2 Operating context including risks and opportunities

In this regard, a strength and weakness analysis is recommended to be disclosed by a company so that investors and other stakeholders have an indication of specific opportunities and risks that a company could be exposed to (IIRC, 2013).

2.4.2.3 Strategic objectives and strategies to achieve those objectives

Kaplan and Norton (1996) are of the view that a company should find a way of communicating strategic information to its investors without publishing competitive sensitive details. An integrated report should, according to the IIRC (2013), disclose a company's short, medium and long term goals, the strategy put in place to achieve those goals, the resource allocation and how the end result will be measured.

2.4.2.4 Governance and remuneration

Issues of governance in South Africa are comprehensively dealt with by the King III report (IODSA, 2009). A company listed on the JSE is required to comply with the recommendations of the King III report, or in case of noncompliance, explain to the reader why (IODSA, 2009; JSE, 2013). A company's integrated report should give an indication of how governance supports value creation (IIRC, 2013).

The collapse of big corporate entities that began in the US in 2007 and the subsequent economic crisis has also brought the issue of executive remuneration into sharp focus (Smit & Nel, 2010). The proposed framework deals with this issue

by recommending the inclusion of the executive compensation policy in the integrated report of companies (IIRC, 2013).

2.4.2.5 Performance

IIRC suggests that companies disclose information describing if strategic goals were met or not. It is suggested that qualitative and quantitative information be provided to substantiate the outcome (IIRC, 2013).

2.4.2.6 Future Outlook

For the IIRC (2013), integrated reporting should be able to provide to readers with information relating to the future prospect of a company. To do this, the company should describe possible future challenges and/or opportunities that could have an impact on their strategy and also to quantify this impact.

2.4.2.7 Perspectives for individual investors

Sections 2.4.2.1 to 2.4.2.6 have provided the inclusion criteria of information in a proposed integrated report. According to Steele and Trombley (2012), market participants use publicly available information as a basis for their expectations from a company. However although there is no definitive best practice in terms of integrated reporting at the moment (Deloitte & Touche, 2011; van Zyl, 2013), overall integrated reporting could revolutionise the way companies communicate with their stakeholders.

According to Eccles et al (2012) and Hindley and Buys (2012), South Africa was the first country to mandate integrated reporting for all companies listed on the JSE. The fact that South Africa is a champion in promoting the publication of integrated report

could be considered an advantage for individual investors as their need for more information on listed companies could be answered by these reports.

2.4.3 Other Sources of Possible Information for Individual Investors

In a world driven by information, individual investors are spoiled for choice in terms of their information sources. Over and above information presented in traditional financial statements and integrated reports, a list of other possible sources of information that could be available to individual investors is provided below:

- **The Security Exchange News Services (SENS):** It is a real-time news service that was established by the JSE in 1997 with the objective of improving market transparency and boosting investors' confidence (Yartey, 2008). Listed companies are required to use the SENS as a primary outlet for any news or price sensitive information, before this information is published through any other medium (Yartey, 2008). For West (2011), the purpose of setting up the SENS was to facilitate the quick, uniform and wide distribution of a company's information and to improve communication between a company and the market.
- **Financial media:** These are specialised news outlets that provide information on companies. Research suggests that significant share price movement happens after the publication of price sensitive information in the media (Davis, 2006). For Davis (2006) the multiplicity of media houses which is compounded with the arrival of new media, have the effect of turning investors into news addicts as they stay on the lookout for information that could have a bearing on their investment decision.

Extrapolating the above research by Davies in the South African context, it could be observed that the South African media environment is characterised by a number of established newspapers and an array of specialised online publications that focus on financial information of companies. These media could be of critical importance to individual investors with limited research capability in acquiring information on companies.

- **Company websites:** According to the Oxford dictionary (Branford, 2000), a website is a location connected to the internet that maintains one or more pages on the World Wide Web. Individual investors will benefit from these websites as they have become a place of choice of communicating information on a company.
- **Social media:** Lietsala and Sirkkunen (2008) describe social media as an umbrella term that relates to cultural practices that is linked to online content and people who are involved with that content. It is characterised by interaction between participants and the sharing of content. Social media has revolutionised the way people communicate and more and more company information is shared through social media platforms such as Twitter and Facebook. Individual investors' presence in social networks will place them on the highway of information. However individual investors will have to be circumspect when using information from these sources as they are the opinion of the individual posting them.

Pellinen et al (2011) list other possible sources of information for investors: school, work, magazines, the internet, friends, television programmes, investment clubs, contact people at the bank and members of a financial union. According to Bukh and Nielsen (2011), companies provide information to the public by means of: annual reports, web pages, investors meetings, conference calls, private meetings, amongst others.

2.5 SUMMARY

This chapter started by discussing what is meant by investing, and later what would trigger an individual to decide to invest his hard-earned savings in a listed company. Investing was defined as the action of allocating one's resources in a venture with the hope of realising positive returns over a period of time. It was established that there is always risks in investing as the outcome of investing could either be a profit or a loss. A choice was made to ignore the risk aspect of investing in a stock exchange as it is not the focus of this study. However an emphasis was placed on the need of education for individual investors as knowledge could save them from

making costly mistakes in their process of investing in a JSE listed company. Furthermore a number of circumstances that could serve as a trigger for the investing decision were identified, for example, saving for education or simply the expectation of a quick gain. It was established that no matter what the catalyst may have been, the aim of individual investors is always a betterment of their personal situation.

A discussion on the concept of the stock exchange was undertaken. How it came to be and why it was needed. In the case of South Africa the need to support the mining industry in its early days led to the establishment of the JSE. Over the years the JSE was found to be a credible platform for trading in shares of companies that are listed on its board. The credibility of the JSE is attributed to its listing requirement that is comparable to the best practice around the world but also because of its use of new technologies in the trading process. Overall the risk of losing all or most of one's investment was found to be the main disadvantage of investing in a listed company, however the stock exchange also give the opportunity to sometimes earn returns that are above inflation.

The above discussion was followed by an analysis on the quest for identifying information sources that could be of use to individual investors. The traditional financial statements were identified as the first point of call for people wanting to have information on a listed company. This is so because JSE listed companies have to comply with a series of rules in their listing requirements that make their financial statements more reliable. However, because the economy is evolving and because of various economic crises that have hit the market especially from the US, there is now pressure from the public for companies to provide more information to its stakeholders. It was established that the need for more information could be answered by the production of integrated reports. The inclusion criterion in these integrated reports were discussed and it was concluded that they would be of great assistance to individual investors wanting to invest in JSE listed companies as it provides them with a wide range of information on the workings and the strategic direction of a company. Information relating to: organisation overview and business model; operating context including risks and opportunities; strategic objectives and

strategies to achieve those objectives; governance and remuneration; performance and future outlook were therefore discussed.

Furthermore it was established that individual investors could procure information regarding a company from various platforms: with SENS, financial media and company websites being examples. However with the new communication technologies, it was also found that social networking platforms such as Twitter or Facebook are now used to spread information on companies. However a word of caution was sounded as far as social media is concerned, its reliability as a source of information on a company is still to be tested.

An overview of the stock exchange as a regulatory environment for listed shares and the information environment of individual investors has been provided in this chapter. The next chapter will discuss ROE and EVA[®] as performance measurement tools for individual investors.

CHAPTER 3 : RETURN ON EQUITY AND ECONOMIC VALUE ADDED[®] AS PERFORMANCE MEASUREMENT TOOLS FOR INDIVIDUAL INVESTORS

3.1 INTRODUCTION

Measuring performance of a company could only be possible if individual investors have at their disposal trustworthy information that will help them in their endeavours. Chapter 2 contributed in providing individual investors with various possible sources of information for performance measurement. The purpose of this chapter is to investigate the concepts of ROE and EVA[®] as performance measurement tools for individual investors when making JSE investee decisions.

This chapter presents a literature review on Return on Equity (ROE) and Economic Value Added (EVA[®]). The first section will give background information on accounting-based performance measurements and value-based performance measurements. Thereafter a discussion on ROE will be undertaken, the discussion will be around the components of ROE, the advantages and disadvantages of ROE as a performance measurement tool and then finally with a discussion of the concept of sustainable growth. Later EVA[®] as performance measurement tool for individual investors will be discussed. The discussion will centre on: why EVA[®] should be used, its origin, the theory behind it and conclude with the advantages and disadvantages associated with the use of EVA[®] as a performance measurement tool for individual investors.

3.2 BACKGROUND

3.2.1 Accounting-based performance measurement tools

Accounting-based performance measurement tools rely squarely on the statement of comprehensive income and the statement of financial position to derive evaluation tools for measuring a company's performance (Hall & Brummer, 1999). They focus on internal operating efficiencies of companies by measuring elements such as Return on Investment (ROI), Return on Assets (ROA) or Return on Equity (ROE)

(Rockmore & Jones, 1996). For Hall and Brummer (1999), and Hall (1999) one of the principles of accounting-based performance measurement models is that the share price is set when the market capitalises a company's earnings per share. Hall (1999) contends that accounting-based performance measures are appealing to investors because of their apparent simplicity and deemed precision. Accounting profit is used extensively in companies' valuations because of its' perceived ability to serve as a good predictor of future company performance (Doukakis, 2010).

However accounting-based performance measurement tools have come under some criticism. Shil (2009) is of the view that the historical outlook of accounting information and their possible distortions may give results that are misleading. This is because they reflect past activities of a company but do not explain how the measured performance is achieved or what should be done to improve on them (Kennerley & Neely, 2003). For instance Rappaport (1983), questioned if measurements such as earning per share (EPS) or return on investment (ROI) could provide a sound link to the main objective of a company that is creating value for its investors.

Accounting-based performance measurement tools are of little value when it comes to measuring if a company is creating or destroying value for its investors (McCroy & Gerstberger, 1992). Arnold (2013) argues that the reasons why accounting-based performance measurement tools are misleading are because accounting is prone to manipulations, companies inadequately representing their investments, the time value of money is ignored in the calculation and there is no consideration for risk. Further the non-inclusion of the cost of capital in their calculations justifies the criticisms levelled against accounting-based performance measurements, making them unreliable predictors of shareholders value creation (Kumar & Sharma, 2011).

Shareholders value is created by cash flow and not by accounting conventions (Rappaport, 1983). This is because accounting standards are not able to report accurately on the true value of a company (Buffet, 1998). Hall (1999) agrees with Buffet when he states that investors are not fooled by accounting cosmetics when evaluating a company. The inadequacy of accounting-based performance

measurement tools lies in the fact that they do not appropriately answer the question whether a company is adding to or subtracting from investors' capital (Hall, 1999). For Al-Mamun and Mansor (2012), criticism of traditional performance measurements could further be justified since they are one-dimensional in outlook, when compared to value-based measurements such as EVA[®].

However, accounting-based performance measurement tools are still fairly popular (Palliam, 2006). This is because of their simplicity, familiarity and availability and owing to the fact that current accounting systems are geared to generate them on a continuous basis (Reimann, 1987). The above discussion on accounting-based performance measurement tools suggest that the investing community has stuck to them because they have been tried and tested over time and their benefits seems to overshadow the short comings. Further the critics of accounting-based performance measurement tools seem to be concentrated on technical and conceptual issues that are not sometimes perceivable by a common individual investor. The next section will continue the discussion on performance measurement by exploring the perspective of value-based performance measurement tools.

3.2.2 Value-based performance measurement tools

To deal with the challenges associated with accounting-based performance measurement tools, value-based performance measurement tools were developed (Madininos et al, 2009). For them this new approach is based on the concept of free cash flow and the cost of capital. For Hall (1999), as important as measuring a company's operating performance may be, it is very important to gauge operating performance against capital that was used to produce it. Therefore all company energy and resources should be geared towards creating value for investors (Ray, 2012).

Value-based performance measurements are new performance measures that are rooted in the shareholders' value approach; companies are evaluated in terms of

investors value created or destroyed (Makelainen, 1998). There seems to be a consensus amongst financial managers that value creation and cash flow are the two most important performance measurements of a company (De Wet & Hall, 2006).

Denton (2006) is of the view that there is a plethora of possible performance measurement tools that are available to investors. Value-based performance measurement systems however give a better framework for evaluating a company's strategy and management abilities, and as they are based strictly on cash flow, they avoid the possible manipulation that could be associated with accounting policy bias (Rappaport, 1983).

Maditinos et al (2009) lists below the most common value-based performance measurement tools and their promoters:

- Shareholders Value Added (SVA) by Rappaport and the LEK/Alcar consulting group
- Cash Flow Return on Investment (CFROI) by the Boston Consulting Group (BCG) and HOLT Value Associates.
- Cash Value Added (CVA) by BCG and the Swedes, Ottoson and Weissenrieder.
- Economic Value Added (EVA™) by Stern Stewart & Co.

The focus on value creation has been driven by the increased competitiveness and shareholders activism that has led investors to expect higher performance from their investments (Athanasakos 2007). Shareholders activism has been fuelled by the effect of globalisation on the financial market and increased shareholders protection (Kumar & Sharma, 2011). These have in turn increased companies disclosure obligations, and have put further pressure on them to improve investor's value. As was presented in Section 2.4.2, integrated reporting could be the answer from the accounting profession to the needs for more information by the public.

Young and O'Byrne (2000) are however of the view that the emergence of value-creation thinking was encouraged by the following developments:

- Globalisation and deregulation of financial markets.
- Weakening of exchange controls around the world.
- Increased liquidity of stock exchanges.
- Better stock exchange regulation.
- Changes in savings and investment patterns.

The views of Athanassakos (2007) above and those of Young and O'Byrne (2000) speak to the same issue but from different perspectives. While Athnassakos emphasises the role of shareholder activists in pressurising companies for more information, Young and O'Byrne emphasise the institutional pressure exerted by the business environment itself. The fact is a performance measurement tool needs to be able to respond to the needs of the users. For most analysts, creating value for a company is synonymous with having profit that is higher than the cost of capital (Abdoli, Shurvarzi & Farokhad, 2012). What is important to investors is whether value is being created by a company (Abdoli et al, 2012). Individual investors therefore need to be equipped with tools that will incorporate the cost of capital when evaluating a company.

Arnold (2013) raises the concern that the value-based approach could be misused in target setting as the increase in the percentage of the value drivers could be unrealistic. Further, there could be a problem with the availability of information because companies are not usually set-up to provide the necessary data for value creation analysis (Arnold, 2013). Ultimately value-based performance measurement tools emphasise on the fact that investor's capital is not free, therefore its cost needs to be taken into account when measuring the performance of a company (Kumar & Sharma, 2011).

Value-based performance measurement such as EVA[®] improve on accounting-based performance measurement tools by calculating economic profit, which is the difference between operating profit after tax and the cost of capital used to generate

such profit (Lehn & Makhija, 1996). Grant (1996) concurred with Lehn and Makhija as his analysis of relative EVA[®] and relative capital invested found that a company's profitability is best measured against the capital used to generate it. What Grant above means is that over and above any accounting cosmetic, investors should, at any point in time, be able to compare the amount of resources invested in a venture against the return earned. The said comparison should be done with the cost of capital as the main focus. The next section will attempt in weighing accounting versus value-based profit.

3.2.3 Accounting- versus value-based profit

According to Merchant and Sandino (2009), there are elements that will affect accounting profit but not economic value:

- Accounting-based profit is backward focused as it fails to anticipate future revenue and costs, whereas value is future orientated.
- Accounting measures focus on individual transactions therefore many changes in value are not reflected in profit figures.
- Accounting measures depend on accounting policy election and the results could vary depending on the choices made.
- Accounting measures reflect losses quicker than revenue. This is because the preparers of financial statements will recognise a loss as soon as they suspect that it may happen whereas revenue is only recognised when it is received or receivable.
- Accounting simply fails to value transactions that cannot be measured accurately or objectively, such as the investment needed to create intangible assets.
- Accounting measures ignore the fact that the cost of equity capital is usually higher than the cost of other debt.

- Variation in risk is not reflected in accounting profit measures. Certainty in cash flow makes a company more valuable, but this is not reflected in accounting profit.

Based on the discussion above it could be observed that both accounting-based and value-based profit attempt to explain the performance of a company, however from a different starting point. Further, the literature does not seem to attempt to explore possible areas where the two concepts complement each other, but simply pits one against the other in an attempt to determine which one was better. In the next section a discussion on Return on Equity will be conducted, as it has been identified in Section 1.2 to be a flagship accounting-based performance measurement that could be useful to individual investors.

3.3 RETURN ON EQUITY (ROE)

Companies' evaluations could only be useful if done in relation to others. Therefore comparison should be done with other economies, an industry and a competitor or against a company's past performance (Reilly & Brown, 2012). Researchers evaluating companies could get assistance from the use of financial metrics as they are an indication of relationships between elements of financial statements (Palepu, Healy & Peek, 2010). Reilly and Brown (2012) divide the metrics into five categories namely: common size statements; internal liquidity or solvency; operating performance; risk analysis; and growth analysis. For Ward and Price (2006), conceptually, ROE takes not only operating performance, but also the way a company is financed and how much tax it pays, into consideration. Based on the discussion in Section 3.2.1 and in Section 1.2 of this study, it was decided that ROE was a better choice as an accounting-based performance measurement tool for individual investors as it could be argued that it sums up the interest investors have in a company.

Performance measures such as ROE have been under discussion by academics and researchers as various groups try to assess its usefulness compared to newer performance measurement tools such as EVA[®] (De Wet, 2005). Investors should

determine their investment horizon if they want to derive some benefit using ROE, as it could show some level of volatility in the short term, however the longer the investment the lower the volatility (Maharaj et al, 2011). A study by Ahsan (2012) showed that a higher ROE is not a guarantee for a higher share price, and alternatively a lower ROE could actually result in a higher share price.

Ross, Westerfield and Jaffe (2010) compute ROE as follows:

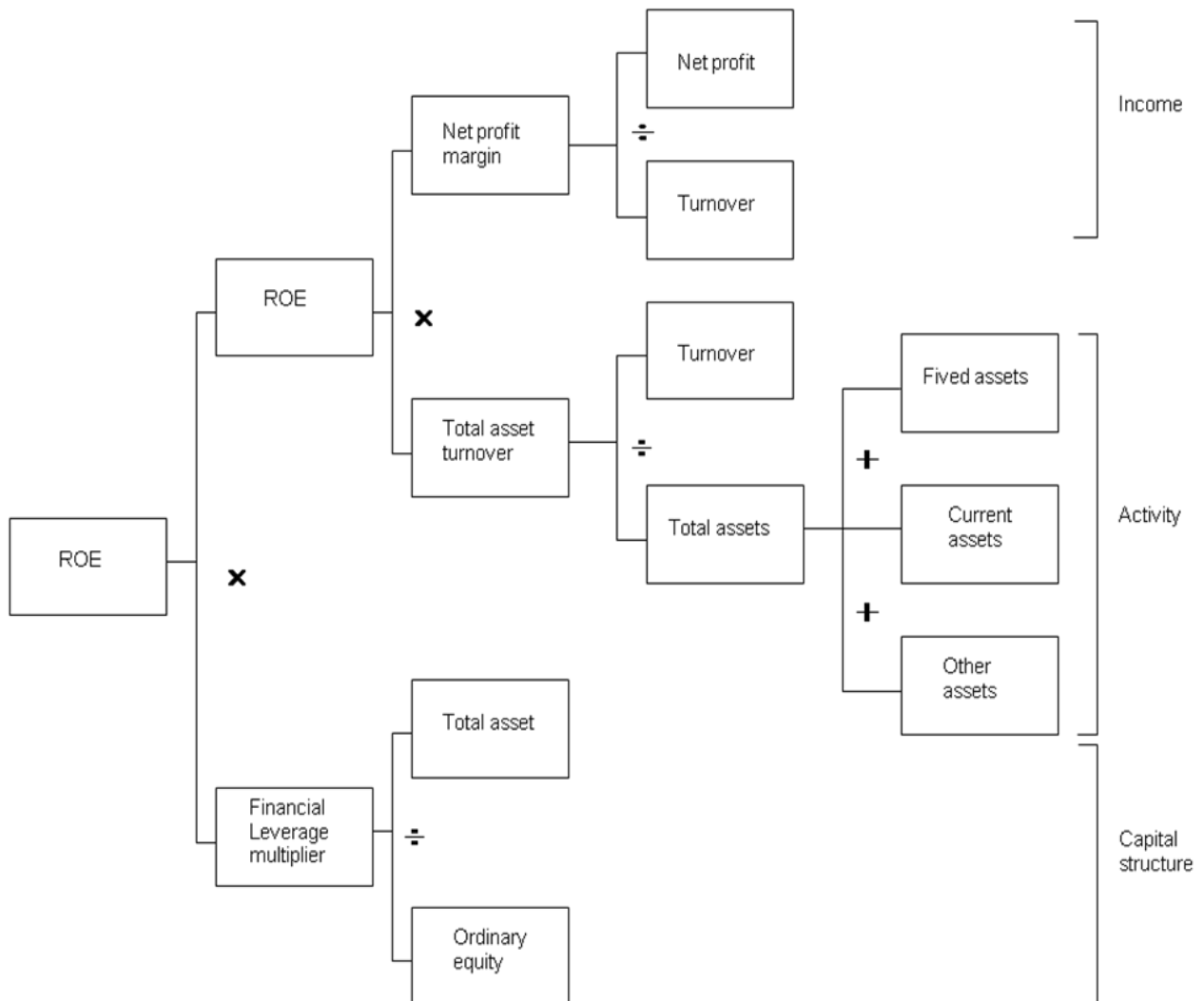
$$ROE = \frac{\text{Net Income}}{\text{Equity}} \quad (1)$$

Because of its importance in the field of performance measurement, it may be desirable to break down the ROE equation into its various components; this is referred to as the DuPont system (Reilly & Brown, 2012). The DuPont system was developed in 1914 by F. Donaldson Brown (Ahsan, 2012). According to Firer et al (2008), the DuPont system explains the elements that drive ROE by using common accounting relationships. For Ahsan (2012), the calculation of ROE expanded as a DuPont equation becomes:

$$ROE = \frac{\text{Net Profit}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Assets}} \times \frac{\text{Assets}}{\text{Equity}} \quad (2)$$

For purposes of explanation between the ROE and DuPont equations stated above and the DuPont system illustrated in Figure 3.1 below, assume that the following terms have the same meaning: Net Income and Net Profit; Sales and Turnover; Assets and Total assets; and Equity and Ordinary equity. Correia et al, (2011) illustrate the DuPont system diagrammatically in Figure 3.1 below:

Figure 3.1 Diagrammatic illustration of the DuPont system



Source: Correia, Flynn, Uliana and Wormald (2011:5-20)

Reference to equation (2) and Figure 3.1 above, notes that the first part of the DuPont equation is illustrated as the top branch in the diagram. The components on the left side of the equation, namely Net Profit divided by Turnover, is referred to by the rectangle as the Net profit margin and to the right, the bracketed area is indicated as the Income component. Firer et al (2008) stated that this first part of the DuPont equation is an expression of how profitable the company is.

The second part of the DuPont equation is illustrated in the second branch as seen in the diagram. To the left of the components of the equation, namely Turnover

divided by Total assets, the rectangle refers to this as the Total asset turnover and to the far right, the bracketed area is indicated as the Activity component. Firer et al (2008) argues that the second part of the DuPont equation expresses how the company manages its assets.

The third and last part of the DuPont equation is illustrated on the bottom branch of the diagram. To the left of the components of the equation, namely Total assets divided by Ordinary equity, the rectangle refers to this as the Financial leverage multiplier and to the right, the bracketed area is indicated as the Capital structure component. Firer et al (2008) argues that the third and last part of the DuPont equation expresses the extent the company uses outside financing for its operations.

In agreement with the opinions illustrated and discussed above, Ward and Price (2006) see the DuPont system as an illustration of components that contribute to a company's performance. In addition, they add the sources of the information, obtainable from the:

- Statement of comprehensive income
 - Profitability = Earnings before interest and tax divided by Sales
- Statement of financial position
 - Activity = Sales divided by Net assets
- Capital structure
 - Leverage = Net assets divided by equity

De Wet and Du Toit (2006) are of the view that ROE could be influenced by impacting on the individual components that form it. In addition to the brief explanation above of the connection between the DuPont equation (2) and the illustration of the DuPont system in Figure 3.1, a further discussion of the three components of ROE follows.

3.3.1 Components of the ROE formula

3.3.1.1 *Net profit margin*

Net profit divided by sales is expressed as a percentage. This is a measure of operating efficiency (Megginson, Smart & Graham, 2010). It gives an insight into a company's costs structure (Reilly & Brown, 2012). The net profit margin of a company will be superior to that of its competitors if it has good cost control mechanisms in place (McGowan & Stambaugh, 2012). Selling price control, cost control and optimisation of product mix could be used to manage the net profit margin (Ward & Price: 2006).

According to Hall (2002), the net profit margin could be improved by doing the following:

- Improving production methods so as to lower the costs.
- Efficient use of factors of production.
- Manage operating expenses by monitoring all the cost drivers.
- Strive for economies of scale.
- Training of employees so that they could be effective at their productive tasks.
- Effective management of overheads.

Palepu et al (2010) contends that the net profit margin helps answer the questions of, whether a company is in line with its stated competitive strategy, if the margin is changing, then why – and whether the company is efficient in managing its costs and overheads. Ultimately, movement in the profit margin is an indication of a company's overall business risk (Reilly & Brown, 2012). It is important to benchmark a company's net profit margin against those of other companies in the same industry as improving profitability could contribute to improving overall company performance over time (Ward & Price, 2006).

3.3.1.2 *Total asset turnover ratio*

The Total asset turnover ratio reflects how effective a company is in using its assets to generate sales (McGowan & Stambaugh, 2012). Palepu et al (2010) argued that because a company invests its resources in acquiring fixed assets, using them efficiently is critical to its overall success. This measure could be important for investors to determine if a company is growing or how a company compares to its competitors (QFinance, 2014). Further, a high ratio could be an indication of overtrading or vice versa, whereas a declining ratio could mean that a company is underutilising its assets.

3.3.1.3 *Financial leverage multiplier*

As mentioned in the discussion below Figure 3.1, this component is an indication of a company's reliance on debt financing for its operations (McGowan & Stambaugh, 2012). Leverage helps companies to acquire an asset base that is above their equity (Palepu et al, 2010). Vernimmen et al (2011) explained that by incurring debt, a company could earn returns that are superior to the capital employed. Ward and Price, (2006) concur with Vernimmen et al when they stated that leverage improves ROE in a profitable company.

Financial leverage could be equated to "magnification" because of its ability to magnify earnings or losses for the owners (Booth et al, 2014). Booth et al (2014) further assert that, financial leverage may be beneficial when a company has a low risk and is making good profit, but it could have a negative effect in times of crises, as it could increase risk. Risk is defined by Ward and Price (2006) as the probability that there will be a deviation from expected results. Increased debt could also increase the value of ROE but this will result in increased interest on loans (Booth et al, 2014). A company that is not able to repay its debts will be in financial distress and therefore increase the risk of the investors (Palepu et al, 2010).

According to (Palepu et al, 2010) the benefits of debt financing include:

- Debt is cheaper than equity financing, as a company could negotiate the interest rate with the lenders.
- Interests are usually tax deductible which is not the case with dividends.
- Improving financial discipline on the side of management, and motivating in reducing unproductive expenditure.
- Communicating with lenders rather than with the equity market.

What the above discussion means is that leverage could bring additional benefits to investors while at the same time be a source of risk. Therefore an investor may have to scrutinise companies so that those that are over-extended in terms of their indebtedness could be avoided.

3.3.1.4 Interaction of the three components of ROE

The three components of ROE seem to be a good barometer for investors to know how a company's management is running the company (Botika, 2012). For Ross et al (2010), if the ROE rate is not according to expectations, breaking it down into its different components could assist in identifying where the problem may be. This could be important to individual investors as it will help them assess management's ability to use production factors at its disposal for the ultimate benefit of the investors. This further supports the usefulness of ROE as a performance measurement metric for individual investors.

3.3.2 Advantages of ROE as a performance measurement tool

ROE justifies its popularity amongst investors because it establishes a link between the statement of comprehensive income and the statement of financial position (De Wet & Du Toit, 2006; Ahsan, 2012). It is also popular amongst analysts, as it represents the end result of the DuPont system (Firer et al, 2008). For Palepu et al

(2010), ROE is therefore a comprehensive indicator of a company's performance since it illustrates how investors' money has been used by managers.

According to Firer et al (2008), ROE gives an indication of how successful investors have been during a year. It indicates how a company has used investors' funds in the past (Rockmore & Jones, 1996). Florou and Chalevas (2010) concur with Rockmore and Jones (1996) when they state that ROE shows how successful a company has been in investing investor's monies. Below a discussion on the disadvantages of ROE as performance measurement tool will be undertaken.

3.3.3 Disadvantages associated with ROE as a performance measurement tool

Makalainen (1998) is of the view that levels of ROE does not indicate if the company is creating or destroying investors' value. De Wet (2005) and Reimann (1989) are of the opinion that the ROE calculation could be exposed to the Generally Accepted Accounting Principle (GAAP) and other accounting conventions manipulations, making it unreliable. Further, a variation in ROE could be influenced by accounting policies such as: capitalisation and depreciation; the lag between investment and sales; or the growth rate in new investments (Rappaport, 1983).

For Al-Mamun and Mansor (2012) one of the shortcomings of ROE is that, it represents past performances, therefore cannot be used for predicting future company value. According to Reimann (1987) ROE seems not to reflect value created by sources other than operating profit. Reimann (1987) illustrates this by giving the example of deferred taxation in defence companies that could be a substantial source of cash flow, but which is not reflected in the ROE calculations.

The change in debt levels combined with the drop in a company's value due to higher financial risk will increase ROE (Rappaport, 1983). According to De Wet and Du Toit (2006) this is because ROE will increase with the use of additional debt as

long as the returns earned are above the cost of borrowing. Further, they contend knowing that increased debt leads to increased risk for a company and this could lead to a drop in the share price and value destruction. Another shortcoming of ROE is that its asset turnover component could increase without it being a sign of efficient use of assets, but rather because of the effect of inflation (Rappaport, 1986).

Based on the above discussion, ROE could be seen as a complicated performance measurement tool for individual investors with limited financial background. ROE is however a very common metric which is therefore readily available to individual investors. It may be important to further expand the ROE equation, so as to assess how dividend pay-out affects a company's future prospects. This is done through the discussion of the sustainable growth concept below.

3.3.4 Sustainable growth rate (SGR)

Individual investors could benefit from an instrument that lends itself to future projections, as they are interested in the future profitability of an investee. It is becoming common for analysts to use the sustainable growth rate as a comprehensive tool with which to measure a company's future prospects (Palepu et al, 2010). The sustainable growth rate is the rate at which a company can grow without affecting its profitability or its financial policies (Palepu et al, 2010).

The sustainable growth rate could be defined as:

$$\text{SGR} = \text{ROE} \times (1 - \text{Dividend pay-out ratio})$$

With the dividend pay-out ratio being equal to the cash dividend paid divided by the net profit. A company's ROE and Dividends pay-out ratio determine the amount of resources available for growth (Palepu et al, 2010).

Sustainable growth is not only connected to profits, it is also needed when estimating future share returns and when forecasting trend setting changes (Lobanova et al, 2010). According to Ward and Price (2006), although the sustainable growth concept is very theoretical, it provides considerable insight into growing a company. The fact

that sustainable growth rate is future orientated adds to the usefulness individual investors could derive from using ROE and its various elements to measure the performance of a company. No further discussion has been conducted on the sustainable growth concept as this could distract from the core focus of the study.

This section has discussed ROE in detail. The next section will discuss EVA[®] in line with the assertion in this study to explore the interaction between EVA[®] and ROE as possible performance measurement tools for individual investors.

3.4 EVA[®] AS A PERFORMANCE MEASUREMENT TOOL FOR INDIVIDUAL INVESTORS

As discussed in Chapter 2, the goal of investors is to invest their funds in companies that could deliver returns higher than the value already embedded in their share price (Olsen, 2003). Value-based Management (VBM) is a management philosophy that uses analytical tools and processes to direct a company's focus towards creating value for investors (Athanasako, 2007). For Arnold (2013) this means gearing the company's overall activities towards the objective of value creation with the ultimate aim of improving the share price.

The drivers of investor's value are: the amount of capital invested; the rate of return required by investors; the actual return on capital; and the time horizon of the investor (Arnold, 2013). However for VBM to contribute to value creation, its traditional principles need to be adjusted, so as to be more investor focused (Olsen, 2003). A company could only fully benefit from implementing VBM if it has established the connection between VBM practices with the needs of its investors (Olsen, 2003). EVA[®] is one of the most popular value-based measurement tools (Erasmus, 2008; Arnold, 2013). It is identified by Athanasako (2007) as one of the main VBM tools to have been studied by researchers. This section therefore aims to investigate the concept of Economic Value Added (EVA[®]). The section will attempt to assess how EVA[®] could help individual investors in their search for value creating companies.

3.4.1 Why EVA[®]

It is important for investors to be able to identify companies that create or destroy investors value (Grant, 2003). Further, investors need to be able to assess how value is created or destroyed (Drury & El-Shishini, 2005). According to Stewart (1991), EVA[®] is the only performance measurement tool that can be linked to the market value of companies. De Wet (2005) is of the view that there is evidence that EVA[®] is a better performance measure, apart from Residual Income, when compared to other performance measures.

De Wet (2005) explains that the superiority of EVA[®] is that it accounts for the full cost of capital. Further, EVA[®] is a measure of real economic profit, a reflection of the use of a company's resources during a given period (De Wet, 2005). Hall (1999) concurs with De Wet when he states that EVA[®] is the best internal measure for giving an indication on the movement of a company's market value. This is important for investors as a link can be established between management's actions and the market value of a company.

Because the aim of investors should be to invest in companies that will produce results superior to what is already accounted for in the current company's valuation (Olsen, 2003). EVA[®] can effectively assist investors in their investee selection process (Grant, 2003). EVA[®] advocates the use of the cost of capital as a primary milestone when evaluating the success of a company (Booth et al, 2014). Ultimately, investors earning a return that is superior to the cost of capital will get a risk-adjusted capital gain or dividend yield that is above average (Olsen, 2003).

EVA[®] may therefore be considered an essential element in individual investors' tool kit as they search the market for value creating companies. Bhasin (2012) argues that EVA[®] is a performance measurement tool that could most closely be associated with the enhancement of investor's wealth in the long run, as it highlights the real

economic profit of a company (Madinios et al, 2009). It could therefore be asserted that those in charge with running a company should consider the impact that their actions have on EVA[®].

Management decisions should be geared towards increasing the intrinsic value of the share price of a company while staying clear of actions that may impact negatively on them (Buffet, 1998). This assertion by Warren Buffet seems to sum-up the expectations of investors. Drucker (1998) is of the view that what is perceived to be a company's profit may not actually be profit, as a company will only generate profit if its earnings are greater than the cost of capital used to produce them. He further acknowledges that even the payment of tax by a company does not prove its profitability. Historically since Alfred Marshall published his book, *Principles of Economy*; the accounting fraternity has been working on finding the necessary adjustments to the accounting profit that will help isolate the cost of capital, as it is believed that unadjusted accounting earning numbers could be a misleading performance measure (West & Worthington, 2001).

The concept of EVA[®] is based on the assumption that an investment will be deemed profitable if the return is higher than the cost of capital (Alexei, 2012). EVA[®] assesses the profitability of an investee (Sharma & Kumar, 2010). For Makelainen (1998), EVA[®] tells the story of what may have happened to investors' wealth. The key to any company is that its earnings should reflect the cost of capital which correctly reflects the investment risk (Hall, 1999). This could be useful information for individual investors as it is important for them to know if a company is creating or destroying value.

Based on the discussion in the preceding sections, it could be asserted that EVA[®] is a refined version of the historic residual income. The refinement is done by adjusting financial statement numbers so as to eliminate any distortions that may have been introduced to them by the use of Generally Accepted Accounting Principles (GAAP). An investor should be able to determine if a decision by a company's management will increase its intrinsic value or destroy it. Investors could make use of EVA[®] as a

tool to make that assessment, as it incorporates all aspects of the workings of a company in a single tool (Bontis et al, 1999).

According to Pierce-Brown (2000), the philosophy of EVA[®] is premised on the centrality of the investor in the life of a company. Pierce-Brown believes that the main objective of a company is to maximise the return of investors. McCrory and Gerstberger (1992) agree with the above when they state that walking in the shoes of investors is a buzz topic amongst company's executives. EVA[®] therefore places investors at the centre of any activity undertaken by a company, as all company activities are measured according to their capacity to enhance investors' value or otherwise. McCrory and Gerstberger (1992) assert that any other objective of a company becomes dependent on the satisfaction of the main objective which is investor's value creation.

3.4.2 Origin of EVA[®]

EVA[®] seems to be a reincarnation of the residual income concept. For Ray (2012) EVA[®] is not distinguishable from residual income which is defined as the subtraction of cost of equity capital from net income. The Institute of Management Accounting in the US (1997) argues that EVA[®] could be linked to Ricardo in the mid 1800's who called it "Super normal rent". EVA[®] is therefore not a new discovery (Makelaine, 1998); however the consulting firm Stern Stewart & Co is credited with the modernisation of the concept and its application to the modern economy (Grant, 2003). According to Singh (2015) EVA[®] is a result of life long work of Joel M. Stern, which culminated in the registration of EVA[®] as a protected trade mark by Stern Stewart & Co in October 1994 in the US.

Although EVA[®] is practically the same as residual income; Stern Stewart & Co has given it so much exposure and publicity that it has been adopted by several large corporations with Coca Cola being one example (Ray, 2012). Ray (2012) explains the success of EVA[®] by the fact that the market was in need of new "value-based"

performance measurements that could help align the interests of companies' management and those of investors.

3.4.3 Theory of EVA[®]

As discussed in Section 3.4.1 above, the change in a company's share price is a reflection of the value created, or destroyed, by such a company. However a company can only influence the internal elements of value creation by striving to achieve an operating return that is superior to the cost of capital (De Wet & Hall, 2004). The underlying theoretical construct of EVA[®] is that it provides answers to whether or not operating profit covers the total cost of capital employed (Makelainen, 1998). EVA[®] is an indication of how close or far a company's earnings is to the minimum rate of return that an investor could receive by investing in a company with a similar risk (Ray, 2012). EVA[®] considers that investors should be compensated for the risk of investing (Makelainen 1998). It could be deducted from the preceding discussion that the need for investors to know a company's performance could be fulfilled with EVA[®], as it may give investors an acceptable and comprehensive performance measure of a company.

Further, no matter what accounting convention is used, the EVA[®] formula will always generate the true value of a company (Makelainen, 1998). This is because it takes into account elements from the statement of financial position and the statement of comprehensive income, and the effect of the double entry, ultimately giving a result that has a real connection with economic variables such as cash flow and dividends. EVA[®] levels could give an indication of the performance of a company's shares in the sense that companies with strong EVA[®] will perform better than those with a less favourable EVA[®] (Ray, 2012).

Operating profit, capital charges, and a periodic cost of capital are used in the EVA[®] calculation (Stewart, 1991). Shil (2009) lists the following steps as part of the EVA[®] calculation process:

- Step 1: Collection and review of financial statements.
- Step 2: Identification of the possible distortion and adjustments needed to make it distortion free.
- Step 3: Identification of a company's capital structure.
- Step 4: Determination of WACC.
- Step 5: Calculation of NOPAT.
- Step 6: Calculation of EVA[®].

Brigham and Ehrhardt (2007) use the following equation to compute the value of EVA[®]:

$$\begin{aligned}
 \text{EVA}^{\text{®}} &= \text{Net Operating Profit after Tax (NOPAT)} \\
 &\quad \text{Minus} \\
 &\quad \text{After Tax dollar cost of capital used to support operations} \\
 &= \text{EBIT (1-Tax rate) minus (Total net operating capital) (WACC)}
 \end{aligned}$$

With:

NOPAT = Net operating profit after tax.

WACC = Weighted average cost of capital.

EBIT = Earnings before interest and tax.

Below is a brief discussion on the elements that form part of the EVA[®] equation:

Net Operating Profit after Tax (NOPAT): is a true cash measure that represents the stream of cash available to providers of capital including investors (Ward & Price, 2006). It segregates operating and funding activities by ignoring a company's interests expense (Erasmus, 2008).

Weighted Average Cost of Capital (WACC): is an estimate of a company's cost of capital (Erasmus, 2008). It is the weighing of debt and equity in proportion to their contribution to the total capital of a company, which will increase or decrease according to the amount of debt in the funding structure (Arnold, 2013). WACC is the average cost of the total financial resources of a company (Davies & Crawford, 2012). In other words, to determine the WACC, the after tax cost of debt is used and

the cost of equity is derived in relation of the capital asset pricing model (Sharma & Kumar, 2010).

Earnings before interest and tax (EBIT): is one of the profit calculation levels in a company. It is a result of deducting overheads from gross profit (Ward & Price, 2006).

De Wet and Hall (2004) list profitability, asset turnover, cash tax rate, the cost of capital and the capital invested as the main internal elements that drive EVA[®]. A value driver is any variable that may have an impact on the value of a company (Hall, 2002). Stewart (1990) asserts that, amongst the various variables that determine the intrinsic value of a company, NOPAT, the tax benefit associated with leverage, the level of additional investment and the after tax rate of return on new invested capital, can be controlled by a company's management. Although there has been much research done regarding EVA[®] in recent times, the views of Stewart above are important as the consultancy Stern Stewart and Co is credited for turning EVA[®] into a viable business, setting the trend for academics and researchers alike to trademark and commercialise their research findings in a profitable way.

Hall (2002) identified sales growth, return on capital amongst the up to 19 possible business drivers that could have an impact on EVA[®]. The number of internal drivers that could influence the value of EVA[®] seems to further justify the statement by Bontis et al (1999) that EVA[®] ties together all aspects of the workings of a company in one single tool. For Alexei (2012), the result derived by calculating EVA[®] indicates if a company has efficiently used the capital at its disposal. Alexei (2012) explains the result of EVA[®] calculation as follows:

- If EVA[®] is superior to zero, that will mean that the company is earning returns that are above the weighted average cost of capital, therefore creating value.
- If EVA[®] is equal to zero the company is earning a return that is equal to the weighted average cost of capital. This implies that investors have covered their investment as well as the risks for investing.

- If EVA[®] is below zero this means that the company is destroying investors' value as the investors could have gained a better return elsewhere with the same risks.

For Hall (1999) EVA[®] will improve if:

- A company earns a return that is a reflection of improved operating margin that is not a consequence of additional investment.
- Further capital investment in projects that generate a profit superior to the cost of capital invested
- Withdrawal of capital from non performing projects.

A number of adjustments need to be done on the normal published accounting framework so as to have an EVA[®] friendly framework (Woods, Taylor & Fang, 2012). Such adjustments also serve to have an EVA[®] that is as close as possible to cash flow, thereby eliminating possible GAAP distortions (Ray, 2012). The result of the above adjustment will, according to Stern, Stewart & Co (2007), show the underlying strength of a company. Hence, it may give the investors a better base for valuation.

However the adjustments to EVA[®] will only be justified if all the four conditions below are met (Correia et al, 2007):

- The adjustments are material.
- The result can be influenced by those computing it.
- The person doing the calculation easily understands the adjustments.
- The information needed is readily available or easy to obtain.

For purposes of this study, no adjustments will be done on the data extracted from the McGregor BFA data base, because of the impracticality of such an exercise for all the companies selected and the time constraints in a study of this nature.

3.4.4 Advantages and disadvantages of EVA[®]

This section will discuss the advantages of EVA[®] as a performance measurement tool for individual investors. It will also discuss the challenges associated with the application of EVA[®] as a measurement of company performance.

3.4.4.1 Advantages

The primary usefulness of EVA[®] is justified by the fact that it takes into account the opportunity cost of the funds used by a company (de Villiers, 1997), and it determines the amount of income value needed to start (Vernimmen et al 2011). According to Ray (2012), EVA[®] is the performance measurement tool that could directly be linked to a company performance over time as it contributes in solving agency problems. Compensation based on EVA[®] helps achieve goal congruence between a company's management and investors. EVA[®] is the most accurate way of knowing the results of a company and is the indicator that seems to have the closest link to investor value (Shil, 2009).

According to Ray (2012) supporters of EVA[®] explain its superiority compared to other performance measurement tools by emphasising its closeness to a company's real cash flow, its ease of calculation and understanding and its better correlation to a company's market value. Stewart (1994) is of the opinion that EVA[®] is superior to other performance measurement tools since:

- It is closer to the real cash flow of a company.
- Its computation is simple and could easily be explained.
- It correlates better to company market value when compared to other performance measurement tools.
- Its application to management compensation helps deal with some of the agency problems as it aligns management interests with the interests of the investor.

For Correira et al (2007) EVA[®] is a better performance measure because:

- EVA[®] gives a good indication of management's performance,
- EVA[®] highlights the cost of capital,
- EVA[®] focuses management on the task of value creation for investors,
- EVA[®] is easy to explain even to people with limited financial education.
- EVA[®] provides a framework for all employees to follow with the objective of value creation for investors,

Ray (2012) agrees with Correira et al, but adds that the fact that EVA[®] is universally applicable compared to other performance measurements that could be sector sensitive, makes it more useful. Ray further adds that the fact that EVA[®] is a period performance measurement tool makes it an effective measure of a company's performance. Rago (2008) lists the following as other benefits that could be derived by the use of EVA[®]: efficiency, manager's incentives, universal applicability, and simplicity in application.

Phillips (2007) argues that the success of EVA[®] as a performance measurement tool lies in the fact that it takes into account all costs including opportunity costs and cost of capital. Ultimately EVA[®] drives value as it is the only internal measure that establishes a clear connection between performance and value (Stewart, 1991). All the benefits listed above could be of critical importance to individual investors since EVA[®] seems to simplify the process of company valuations and therefore simplifies the individual investors' work in terms of putting together data that could be the basis of their decisions.

3.4.4.2 *Disadvantages of EVA[®] as a performance measurement tool*

Pierce-Brown (2000) considers that it may be very optimistic to assert that one single measure could reflect all the complexities of today's business environment. The main criticisms of EVA[®] are that it could be considered a short term performance indicator (Shil, 2009).

EVA[®] may not be suitable as a primary performance measurement tool for companies that make initial big cash outlays but expect the rewards only in the future (Makelainen, 1998). That is because their current performance measure may be misleading in the short run. Brewer, Chandra and Hock (1999) demonstrated that two companies of different size could have a different EVA[®]; they found that a larger company with more resources could be perceived to be creating more value compared to a smaller company that has resource limitations.

A study by de Villiers (1997), shows that EVA[®] could be distorted by the effect of inflation, and that under inflationary circumstances EVA[®] could produce inaccurate results. A study by Moradi, Ghomian and Fard (2012) established that EVA[®] could be influenced by some of its underlying components such as intangible assets.

Ray (2012) summarizes below some of the most common side effects of EVA[®].

- Calculation could become complex if there is too many adjustments to do.
- The universal suitability concept seems to be “difficult” to accept.
- Short term versus long term.
- Inflation is not considered.
- The use of some depreciation could have a distorting effect on EVA[®].

This section has highlighted reasons why investors could use EVA[®] as an instrument of choice in their company selection process. The possible drawbacks of the use of EVA[®] have also been presented. It could be said that the benefits of using EVA[®] as a performance measurement outweigh the disadvantages.

3.5 SUMMARY

This chapter has positioned value creation as the main objective of a company. However to measure the value created or destroyed, two perspectives were canvassed: accounting-based and value-based performance measurement tools.

Accounting-based performance measurement were said to be reliant on a company's financial statements so as to assess how well resources were being used. Although Accounting-based performance measurements were said to be conceptually flawed, that seems not to dent their popularity amongst investors and managers alike as they were found to still be very popular. EVA[®], a value-based measure was found to be more appropriate for the task of measuring the value created or destroyed by a company, this because they take into account the cost of capital in their evaluation of a company. It was said that shareholders activism and increased competitive pressures are at the roots of the development of value-based performance measurement tools. A choice of ROE and EVA[®], as the accounting-based and value-based performance measurement tools, for the purpose of this study was made. The rationale of this choice was explained in Section 1.2.

The discussion on ROE centred on the concepts and its usefulness to individual investors. If ROE could be computed as a company's net income divided by its equity, it was found that expanding ROE into its various components could be more useful. The DuPont equation as the expanded ROE formula is known has the advantage of isolating the net profit margin, the total asset turnover ratio and the financial leverage components of ROE. It was found that influencing the individual components could have a bearing on the overall ROE level. The concepts of sustainable growth were introduced. It was found that in combining ROE with the dividend pay-out ratio projections could be made on the future profitability of a company.

In discussing EVA[®], it was found that it was one of the most popular value-based performance measurement tools. EVA[®], popularised by the consulting firm Stern Stewart and Co, was presented as a measure of a true value of a company. It is said to give an indication of the value created or destroyed by a company. Therefore the level of EVA[®] could be considered to be an indication of the level of the wealth of the investor. To compute EVA[®] the after tax Rand cost of capital used to support operations is subtracted from net operating profit after tax. However, a number of adjustments are necessary to rendered common financial statement EVA[®] compliant. Ultimately EVA[®] was found to give investors and indication of the underlying strength

of a company therefore justifying its usefulness and its choice as the value-based tool to use for the purpose of this study.

This chapter has completed the literature review portion of this study. The next chapter will discuss the methodology that will be applied for the empirical part of the study.

CHAPTER 4 : METHODOLOGY

4.1 INTRODUCTION

The need to make intelligent and informed decisions is the main motivation for conducting research (Zikmund et al, 2013). Although individual investors have a multitude of performance measurement tools at their disposal, the starting point of this research was to investigate whether the interaction of ROE and EVA[®] could provide additional benefits to individual investors during their decision-making process on JSE listed companies. The end product of this research will be to produce evidence that could contribute to resolving the research problem.

The objectives of the research were therefore to:

- Identify individual investors' sources of information, when assessing JSE listed companies. This was done through the literature reviewed in chapter 2.
- Investigate the concepts of ROE and EVA[®] as performance measurement tools for individual investors when making JSE investee decisions. This was done through the literature reviewed in chapter 3.
- Explore with the help of a statistical construct, whether knowledge of the interaction of a company's ROE and EVA[®] could form a better basis for individual investors in making decisions on investments on JSE listed companies, than either of the two metrics standing alone. The literature review in chapter 3 has laid the theoretical foundation on which, ROE and EVA[®] stand. An empirical study will now be conducted with the objective of collecting more evidence on the usefulness of ROE and EVA[®] for individual investors.

This chapter provides a structure that will be used so as to have credible results from the empirical tests that are to be done. The discussion relates to the third objective, therefore the empirical part of the study. The purpose of the empirical part of the study is to collect evidence that would support or disprove the literature review

presented in chapters 2 and 3. This is in line with De Vans (2001) who is of the opinion that it is important for any social research to have a design or a structure before data can be collected and analysed.

The following sequential steps according to Malhotra (2010) are those which may be followed during a comprehensive research process. These steps are:

- Problem definition;
- Development of an approach to the problem;
- Research design formulation;
- Fieldwork or data collection;
- Data preparation and analysis
- Report preparation and presentation.

This study has taken into consideration the steps listed by Malhotra. At this point the first two steps have been followed as could be seen in Sections 1.3 and 1.8. Further the research design and fieldwork will be addressed in this chapter and chapter 5 will deal with data preparation and analysis while the last step being the report preparation and presentation will be addressed in chapter 6. This chapter will start by discussing the research design and the research method thereafter the limitation of this study and ethical considerations will be acknowledged.

4.2 RESEARCH DESIGN

A study could be either qualitative or quantitative: Zikmund et al (2013) describe qualitative business research as one which allows the researcher to use methods that help interpret business issues without depending solely on numerical data. Zikmund et al (2013) assert that qualitative research is more researcher dependent as the onus is on the researcher to find meanings in a wide range of unstructured responses. Therefore in qualitative research what matters is the quality of data collected and not the quantity.

Quantitative research, on the other side, could be described as one that manipulates variables and controls natural phenomena (Leedy, 1993). It is expressed in numbers and lends itself to statistical manipulation (Madrigal & McClain, 2012). As will be discussed further below, the empirical part of this study is expressed in numbers and lends itself to statistical manipulation therefore it is quantitative in nature.

The strength of quantitative research is that it provides data that are descriptive; however by doing so it could miss the underlying conceptual reason behind the numbers (Madrigal & McClain, 2012). This researcher will, when analysing data, attempt to contextualize these data therefore mitigating the shortcoming stated above.

In the literature review section of this study it is acknowledged that ROE and EVA[®], when used separately, could be useful to individual investors when assessing the performance of a company. The empirical part of the study however seeks to explore whether an individual investor could be better informed about a company's situation by combining the two performance measurement tools. To do that, the existence of any relationship between ROE and EVA[®] on the one hand and the share price of a company on the other should be explored. Hofstee (2006) contends that correlation-based research establishes whether a relationship exists between two or more variables. Kumar (1996) adds that correlation studies seek to establish the level of interdependence between the variables. Further correlation-based research aims to determine the level of relationship between events that are being studied (Hofstee, 2006). Correlation-based research therefore appears to be the most appropriate approach in meeting the third objective of this study.

4.3 THE RESEARCH METHOD

Research is a systematic inquiry aimed at providing information to solve a problem (Emory, 1985). For Emory, research should always be problem based. The problem the empirical part of the study aimed to resolve was exploring the usefulness of the

interaction of ROE and EVA[®] as possible performance measurement tools to individual investors.

The discussion in Section 4.2 has illustrated why this study is quantitative. The quantitative aspect of this study is supported by the statistical tests that will be conducted on data to explore if there might be a meaningful relationship between the independent variables that are ROE and EVA[®] and the dependent variable namely the share price of companies listed on the Top100 of the JSE.

Hofstee (2006) argues that the methodology section should include a discussion of the research instruments, the data and the analysis. Where no formal research instruments are used therefore where the information is being gathered by the researcher, Hofstee (2006) states that the sources of data should be discussed. In line with the approach suggested by Hofstee (2006), this section will therefore describe the sources of data, the data and the analysis thereof.

4.3.1 Sources of data

In Section 4.2, correlation-based research was justified as the most appropriate method for this study. The data used for his study are financial reports of the studied companies as extracted from the McGregor BFA database. From these financial reports information necessary for the calculation of ROE and EVA[®] were extracted and placed on a Microsoft Excel spreadsheet (Appendix 1). Further the average yearly share price was calculated as could be observed in Appendix 3. The share price imputed in the statistical model was adjusted by the inflation rate (Appendix 2). Going forward any mention of share price will mean the inflation adjusted average share price. The next subsections will discuss the validity and reliability of the study.

4.3.1.1 Validity

Validity implies that the test performed by a specific study will measure what it was intended to measure (Kumar, 1996). The variables that relate to the empirical part of this study are ROE, EVA[®] and the share price. For this study to be considered valid, it should be able to determine the stated variable. It could be said that the variables are common accounting performance measurement tools therefore they could be calculated as illustrated in Appendix 1. These are valid variables therefore a statistical model could be built from them. To accommodate the size of Appendix 1, all the appendixes have been placed on a Compact Disc accompanying the print version of this study.

Furthermore canvassing the opinion of an expert in the field of a study further reinforces the validity of the study (Krishnaswamy, Sivakumar, & Mathirajan, 2009). A discussion on the time series was undertaken with the view to determine the time frame of the study. As discussed in Section 4.3.3 above it was decided that three years of data will be enough for this study. A statistician was consulted in detail and his input led to modifications in the data which contributes to the validity of the study.

4.3.1.2 Reliability

Reliability refers to the scale of predictability, stability and accuracy of a research instrument (Kumar, 1996). A research instrument will be deemed reliable if it produces consistent measurements (Kumar, 1996). As stated in Section 4.3.1 no research instrument was used for this study. The results of this study are however believed to be reliable because of the origin of the data used. The McGregor BFA is a database of companies' information; they are a market leader in storing companies' data and are trusted by universities and the industry at large as a trustworthy source of information on companies. It is therefore considered to be a reliable source of data for the purpose of this study. Further, the formula used to derive ROE and EVA[®] are standard in the field of accounting. This reinforces the reliability of the study.

4.3.2 Data

In this subsection the data used for this study will be discussed, this means discussing the population of this study and the sampling procedures used by the researcher. The data used in the empirical analysis were historical in nature as they were sourced from companies' financial reports, as filed with the JSE and saved on the McGregor BFA database. The daily closing share price used for the calculation of the average share price was also sourced from the same database.

The McGregor BFA is a repository of historical financial data of the companies listed on the JSE. It is a requirement of the Companies Act, Act No 71 of 2008, for companies to produce financial statements on a periodic basis which are filed with regulatory bodies (South Africa, 2008). These financial statements automatically become public documents for which, no specific permission is needed by a researcher for research purposes.

4.3.2.1 Research population

The research population could be defined as the study object: it may be an individual, group, organizations, human products and events, or the conditions to which they are exposed (Welman, Kruger & Mitchell, 2005). For Zikmund et al (2013) a population is any complete group: that could be people, sales, territories, stores or even college students. The population for this study is companies listed on the JSE for the period 2010 to 2012.

There was no other specific selection criterion for the companies used in the research except that; a company had to be part of the Top100 companies in the JSE during the period of the study. The researcher elected to use 3 years of financial statements, from the period 2010 to 2012, with the aim of avoiding the 2008 crisis year that could have materially distorted the result of this study. It was further assumed that using the Top100 companies would be sufficient for the statistical model to establish any meaningful relationship between the variables that were studied.

4.3.2.2 *Sampling procedure*

Sampling is a process whereby a researcher will select a number of observations within a population upon which the study will be conducted, the objective being to derive conclusions that could be generalized on the entire group (Kumar, 1996). It is therefore important that the sample contains elements that are representative of the group that is being studied (Kombo & Tromp, 2006).

Kumar (1996) describes judgmental or purposive sampling as a method whereby the researcher has the latitude to apply his judgment in choosing the sample of the study, the idea being to choose amongst the population those who would provide the best information, thus achieving the objectives of the study. The Top100 companies on the JSE according to market capitalization for the period of the study were used. The Top100 companies on the JSE were targeted because the JSE has a set of rules that companies listed on its board are required to subscribe to. The researcher applied judgmental approach in identifying suitable companies for the purpose of this study. However, it is assumed that the findings of this study could be extended to the rest of JSE listed companies. This is because the metrics being studied could be calculated from the financial statements of any listed companies, and/or any company complying with IFRS.

It was assumed that companies on the Top100 are compliant with all the listing requirements of the JSE. It was further assumed that these companies accounting teams are more likely to have the staffing capacity to produce the kind of accounting information useful for this study.

4.3.3 Data analysis and interpretation

According to Kumar (1996) a researcher should prepare a frame of analysis before starting to analyse research data. This should consist of variables to be analysed

and the analysis that would be conducted. According to Burns and Bush (2006) data analysis could be: descriptive, inferential, differential, predictive or associative.

This study has used the differential and associative approach in its data analysis as it sought to determine the existence of any relationship between studied variables. For the purpose of this study a correlation and a linear regression analyses was conducted to give the reader a statistical view of the subject matter. The correlation and linear regression analyses was used to determine the type of relationship between a company's ROE and EVA[®] on one hand and its share price on the other. Therefore it was necessary to determine ROE, EVA[®] and the share price that was to be used for the analyses.

Data was organized in a Microsoft Excel spreadsheet. From the spreadsheet, ROE and EVA[®] were derived using the formula described in Section 3.3 equation 1 for ROE and Section 3.4.3 for EVA[®]. For the purpose of the EVA[®] calculation, the researcher used the WACC from the McGregor BFA as it was readily available (see Appendix 5 for the path to get to the WACC on the McGregor BFA). The side effect of this choice was that, the three gold mining companies that form part of the Top100 for the period were ignored because the model used to derive WACC by the McGregor BFA does not calculate it for gold mining companies as they are considered to be in a declining industry. This was considered to be insignificant by the expert statistician who helped construct the test model.

In Section 3.4.3, it was established that under certain circumstances it may not be necessary to adjust published data in the process of calculating EVA[®]. It is assumed in this study that those conditions explained in the stated section have been met. Therefore, there were no adjustments to the data extracted from the McGregor BFA for the purpose of calculating EVA[®]. Furthermore, the share price used was adjusted by inflation rates as provided by Statistics South Africa (see Appendix 2 for inflation rates table). The researcher deemed it necessary to adjust the share price with inflation as he believed that the adjustment will give an indication of the real market value of the shares. The Microsoft Excel spreadsheet described above was

the input for the statistical work that was undertaken and is represented by Appendix 1.

Based on the discussion in this section, a Pearson correlation analysis was undertaken to verify whether there were any meaningful relationships between the variables stated above. Then multiple linear regression analyses were done with adjusted share price as the dependent variable and average ROE and average EVA[®] as independent variables.

4.4 LIMITATIONS

The quantitative technics used in this study implies that the reader needs to have an understanding of statistics and fair numerical acumen. This could be limiting as it is fair to assume that not all individual investors will have those skills therefore will not be able to benefit from this study.

4.5 ETHICAL CONSIDERATIONS

Research ethics refers to societal morals applicable to a researcher when choosing a topic to research or when research is being conducted (Goddard & Melville, 2006). The ethical considerations taken into account in this study are in line with the Unisa Ethics Policy relating to researchers. Ethical clearance in conformity with the applicable policies of Unisa has therefore been obtained.

As already stated, the secondary data used in this study were accessed from a public platform, the McGregor BFA. Therefore there was no need for the researcher to apply for any specific permission from the companies studied. Nevertheless, the findings for this study have been presented anonymously so that performance of a specific company or a sector of activity has not been singled out. This should help avoid the potential of negative publicity regarding a company or economic sector.

4.6 SUMMARY

This chapter started by placing the research in context. It was found that the need of making decisions that are informed by fact was the main reason behind conducting research. However for research to have credibility, it needed to have a structure that could be used as a roadmap for empirical work. This chapter provides such a structure. The population for this research was JSE listed companies for the period 2010 to 2012.

The study was said to fit the characteristics of a quantitative and correlation-based research design. The reasoning was that this study manipulates variables namely ROE, EVA[®] and the share price of JSE listed companies. All these variables are expressed in numbers and therefore lend themselves to statistical manipulation. Correlation and multiple linear regression analyses were identified as the methods that were to be used in solving the research problem.

Furthermore a detailed description of the data were undertaken, the source of the data was company's financial reports as saved on the McGregor BFA database. These data were used for the purpose of deriving the various variables that are being studied. For the ease of manipulation Microsoft Excel spreadsheets were used to analyse and manipulate the data. The data were organised into appendixes, explanation of the content of these appendixes was provided. Emphasis was put into explaining the content of Appendix 1 as it was the main input to the statistical model that was used for the study. The data was said to be valid and reliable.

For the purpose this study, judgement was applied in choosing the Top100 companies listed on the JSE by market capitalisation for the period of the study as the sample. The reason given was that these companies were more likely to produce the kind of financial report necessary for a study of this nature.

The limitation of the methodology was explained to be that there is an emphasis on the statistics, which could be difficult to understand for some individual investors. Ethical considerations relating to the study was also presented. This chapter has therefore set the scene for the work that is to follow. Chapter 5 will now deal with the research findings.

CHAPTER 5 : RESEARCH FINDINGS

5.1 INTRODUCTION

Following the application of the methodology described in chapter 4, this chapter presents the data analysis and the research findings. The focus is on the output of the statistical investigations performed on the data. Section 5.2.1 will start by describing the population of this study; thereafter the relationship between the average ROE and the adjusted average share price will be investigated in Section 5.2.2. Section 5.2.3 will investigate the relationship between average EVA[®] and the adjusted average share price. Then in Section 5.2.4, the effect of the interaction between average ROE and average EVA[®] on the adjusted average share price will be investigated.

As discussed in Chapter 4, for the purpose of this study, data was extracted from the McGregor BFA database. Companies were sorted according to market capitalization between 2010 and 2012. It was assumed that using three years data might produce results that are reliable.

5.2 DATA ANALYSIS

As previously stated, the first two objectives of this study have been met by the literature reviewed in chapter 2 and 3. The purpose of the literature review was to familiarize the researcher with the work that others have done in the field concerning which research is being conducted, whilst bringing clarity and focus to the study that was conducted (Kumar, 1996).

For the third objective to be met, it was deemed that the use of statistical techniques could be more appropriate. The third objective of the study is restated below:

“Explore with the help of a statistical construct, whether knowledge of the interaction of a company’s ROE and EVA[®] could form a better basis for

individual investors in making decisions on investments on JSE listed companies, than either of the two metrics standing alone.”

The above objective could be split as follows:

- Investigate the relationship between the average ROE and the adjusted average share price.
- Investigate the relationship between the average EVA[®] and the adjusted average share price.
- Investigate the effect of the interaction between average ROE and average EVA[®] on the adjusted average share price.

In the following subsection the characteristics of the population will be described followed by the outcomes of the various investigations.

5.2.1 Description of the population

The companies selected for this study are listed in Appendix 4. Out of the initial 100 companies only 92 were included in the study due to gold companies not being considered for the reasons explained earlier. Companies for which records did not exist for the whole period of the study were also ignored. Furthermore in the process of building the scatter plot for the Log average ROE and Log Average EVA[®], two outliers appeared, one for ROE and the other one for EVA[®]. The two companies concerned were therefore ignored from that point onward, bringing the population to 90 companies.

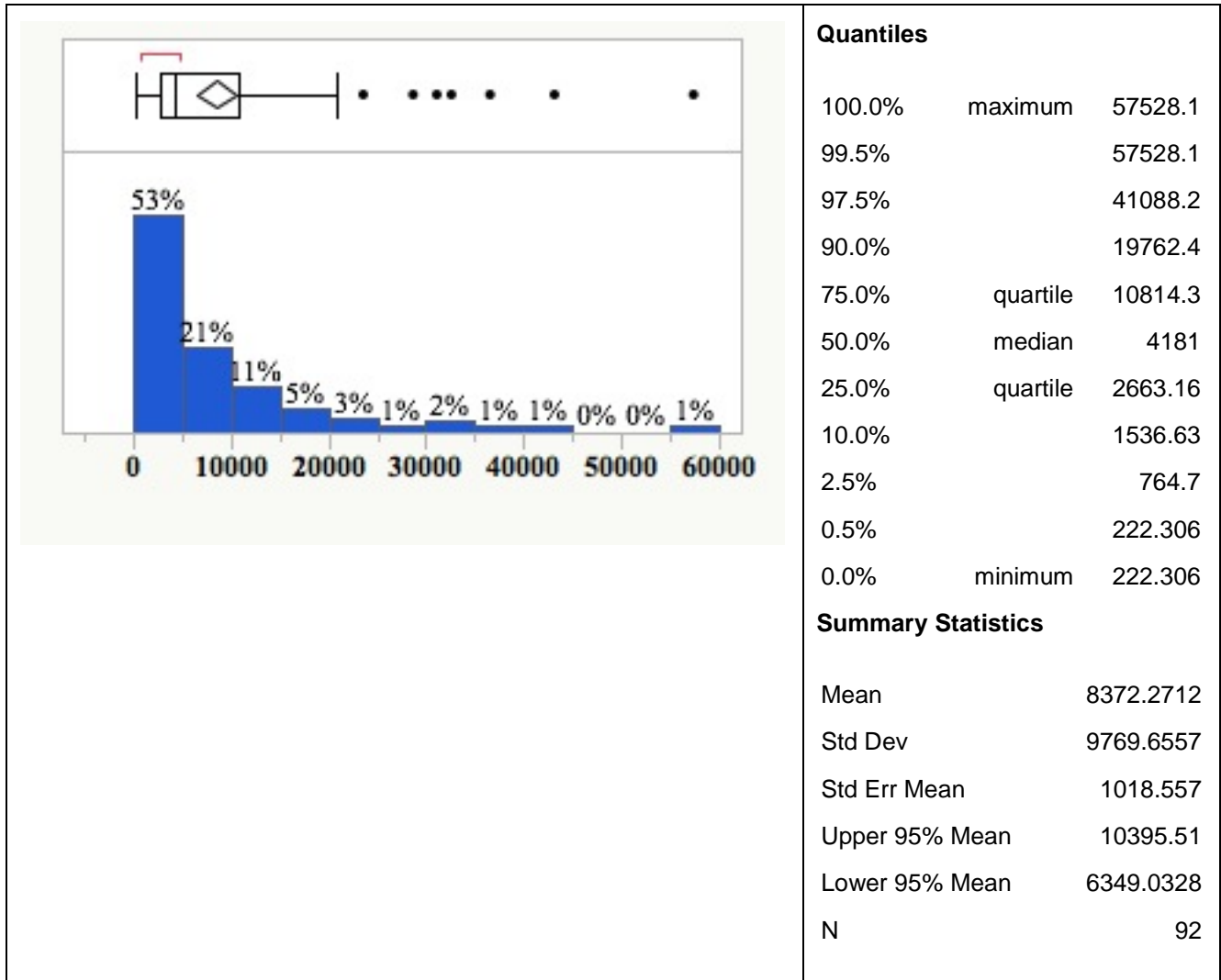
It is customary in statistical modelling to use logarithms in the case where a distribution is considered to be skew (Zumel & Mount, 2013). The distribution in this study is skew because some companies have numbers that are very large when compared to others. This is consistent with economic data, since the inclusion criterion is market capitalization; it is normal that companies at both ends of the ranking will differ in size. Furthermore, the mean of the distribution was calculated so

as to have the average of the variables for the three years of the study. Below is the description of the variables used for this study in terms of: The adjusted average share price, the adjusted Log share price, average ROE, Log average ROE, average EVA[®] and Log average EVA[®].

5.2.1.1 Adjusted average share price

The dependent variable for this study is the share price of the companies studied. The calculation in Appendix 3 shows how the average daily share price was turned into a yearly average. Further for the purpose of the statistical model, the average share price was adjusted with inflation as explained in Section 4.3.3. Figure 5.1 is a histogram representing the distribution of the adjusted average share price.

Figure 5.1: Histogram and descriptive statistics of the adjusted average share price



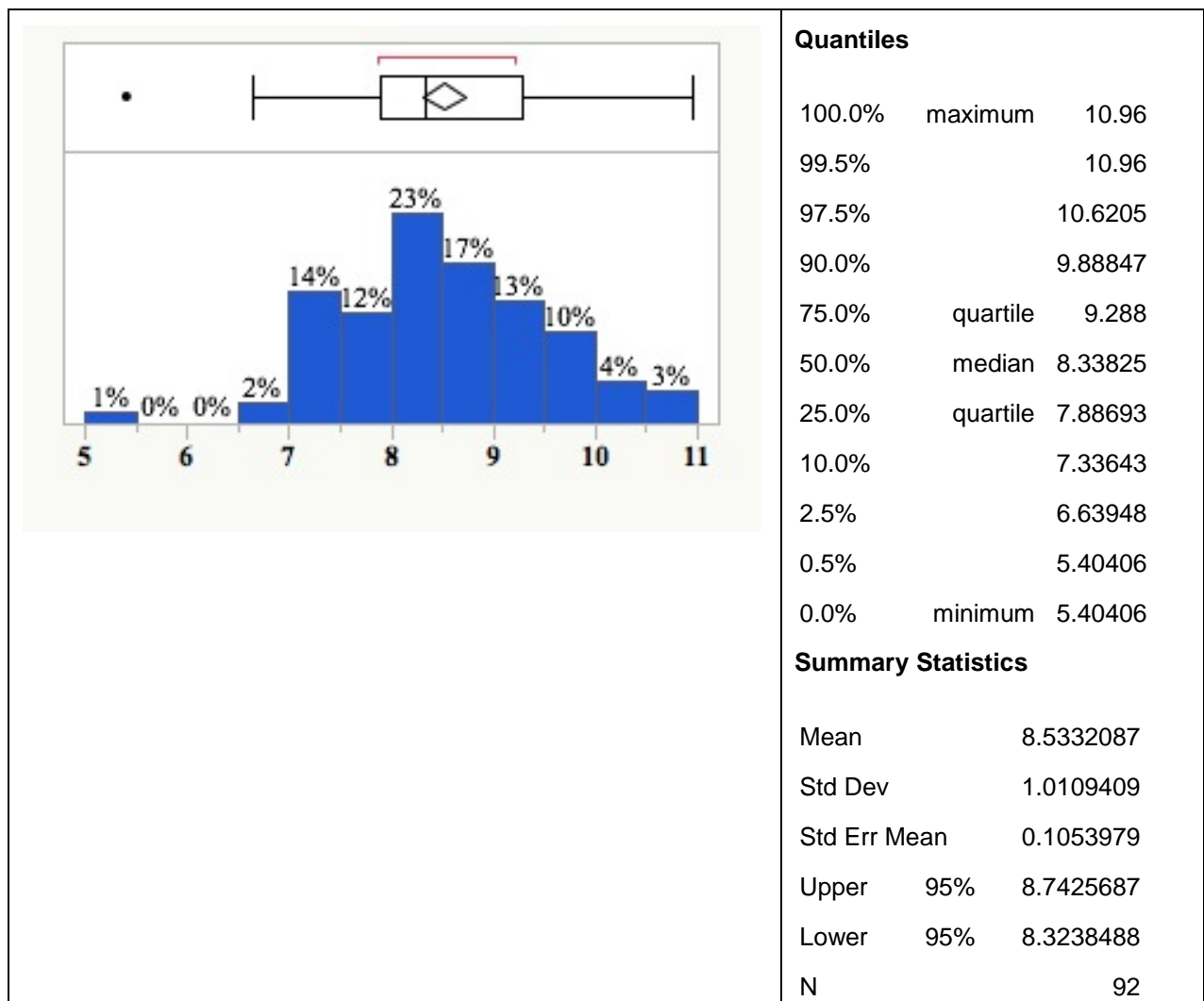
Source: output from the statistical package.

It can be observed from Figure 5.1 that we are dealing with a positive skew distribution. The skewedness of the distribution is illustrated by the fact that the median is R4181 while the average is R8372.27 as could be observed on the descriptive statistics in Figure 5.1. In the next subsection the distribution is normalized by the use of the log

5.2.1.2 Log of the adjusted average share price

According to Zumel and Mount (2013), Skewed distributions are normalized with the use of the logarithms. Normalizing of the data is important especially when conducting a correlation or a linear regression analyses as it enhances the reliability of the outcome of a study (Zumel & Mount, 2013). Natural Logarithms have therefore been applied to the adjusted average share price information, with the Log of adjusted average share price illustrated in Figure 5.2.

Figure 5.2: Histogram and descriptive statistics of the Log of the adjusted average Share price



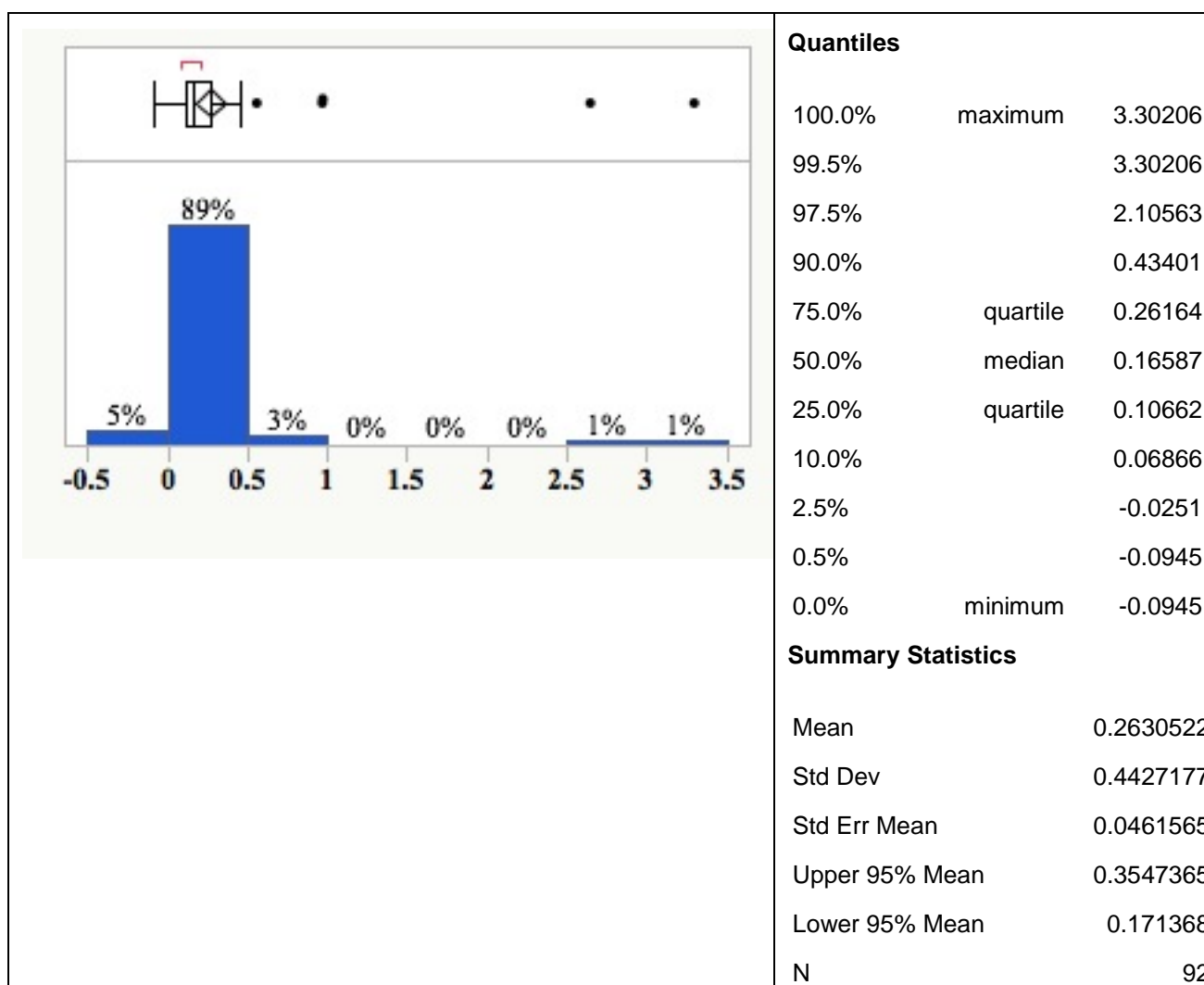
Source: output from the statistical package.

The Log has rendered the distribution fairly normal as can be seen in Figure 5.2. This could be observed when comparing Figure 5.1 and Figure 5.2 as Figure 5.1 look skewed to the left towards zero whereas Figure 5.2 looks more symmetrical.

5.2.1.3 Average ROE

ROE is one of the independent variable of this study. Its choice was explained in Section 1.2. Further the calculation of average ROE was explained in Section 4.3.3 and illustrated in Appendix 1. Figure 5.3 is a graphical representation of the distribution of average ROE.

Figure 5.3: Histogram and descriptive statistics of average ROE



Source: output from the statistical package.

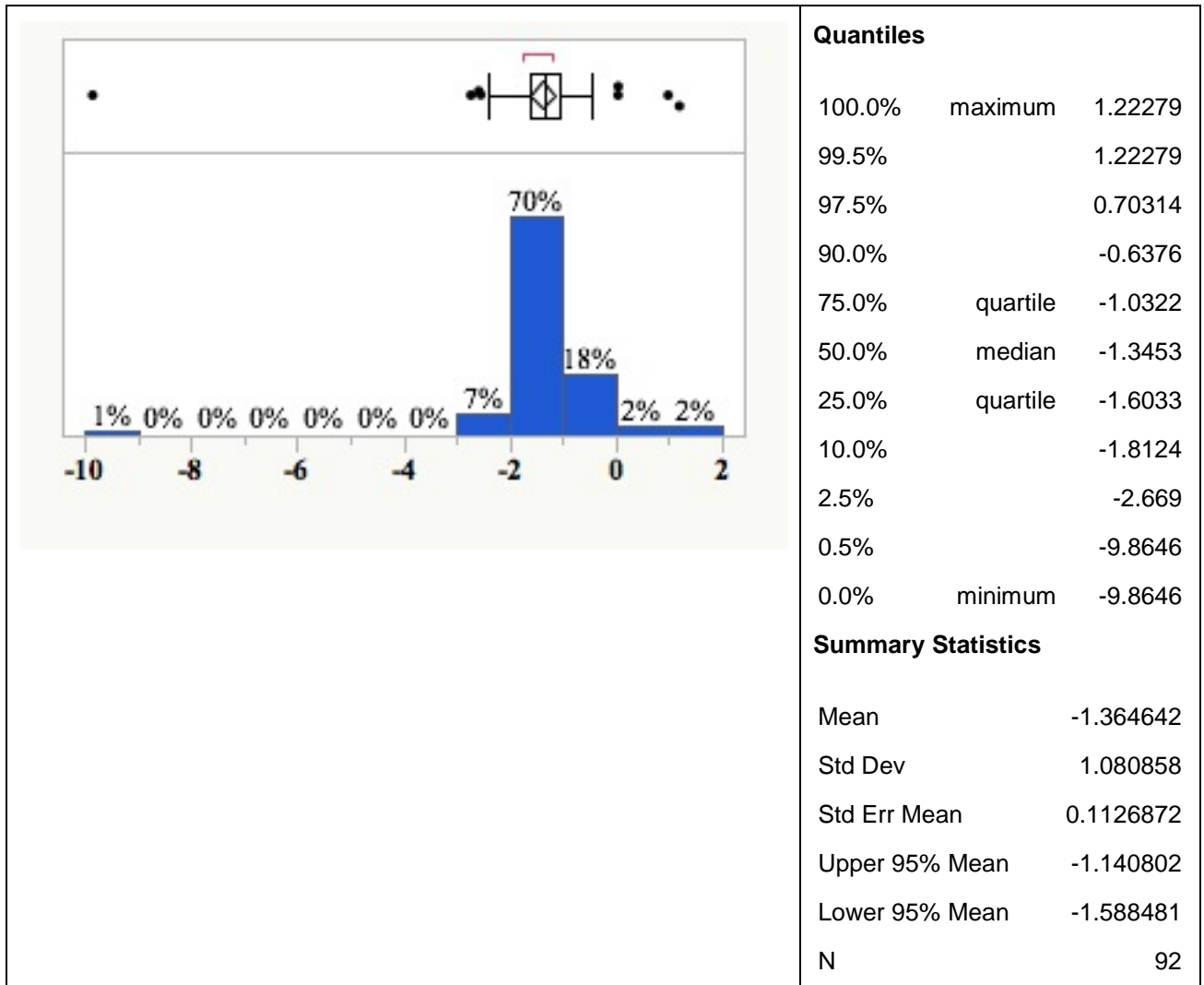
Figure 5.3 illustrates a distribution that is skew. From Figure 5.3, the average ROE is found to be 0.2630522 while the maximum average ROE is 3.30206 and the minimum -0.0945. Further it is also observed that some companies have a negative

average ROE, which is consistent with the literature reviewed in Section 3.3. This further supports the literature review that established that not all companies are able to produce a positive return on the equity of investors. The next subsection will normalize the distribution with the use of Logs.

5.2.1.4 Log average ROE

Keeping in line with practice, the data used for the calculation of average ROE needed to be normalized by calculating the Log. However since Logs cannot be calculated for negative numbers and seeing that some companies have negative average ROE, a constant (0.0946) was added to the Log calculation to make the calculation possible irrespective of the number of negative values. The constant is the minimum on the descriptive statistics portion of Figure 5.3. It has been converted so as to make it a positive number. Figure 5.3 is the Histogram and descriptive statistics of Log average ROE.

Figure 5.4: Histogram and descriptive statistics of Log average ROE



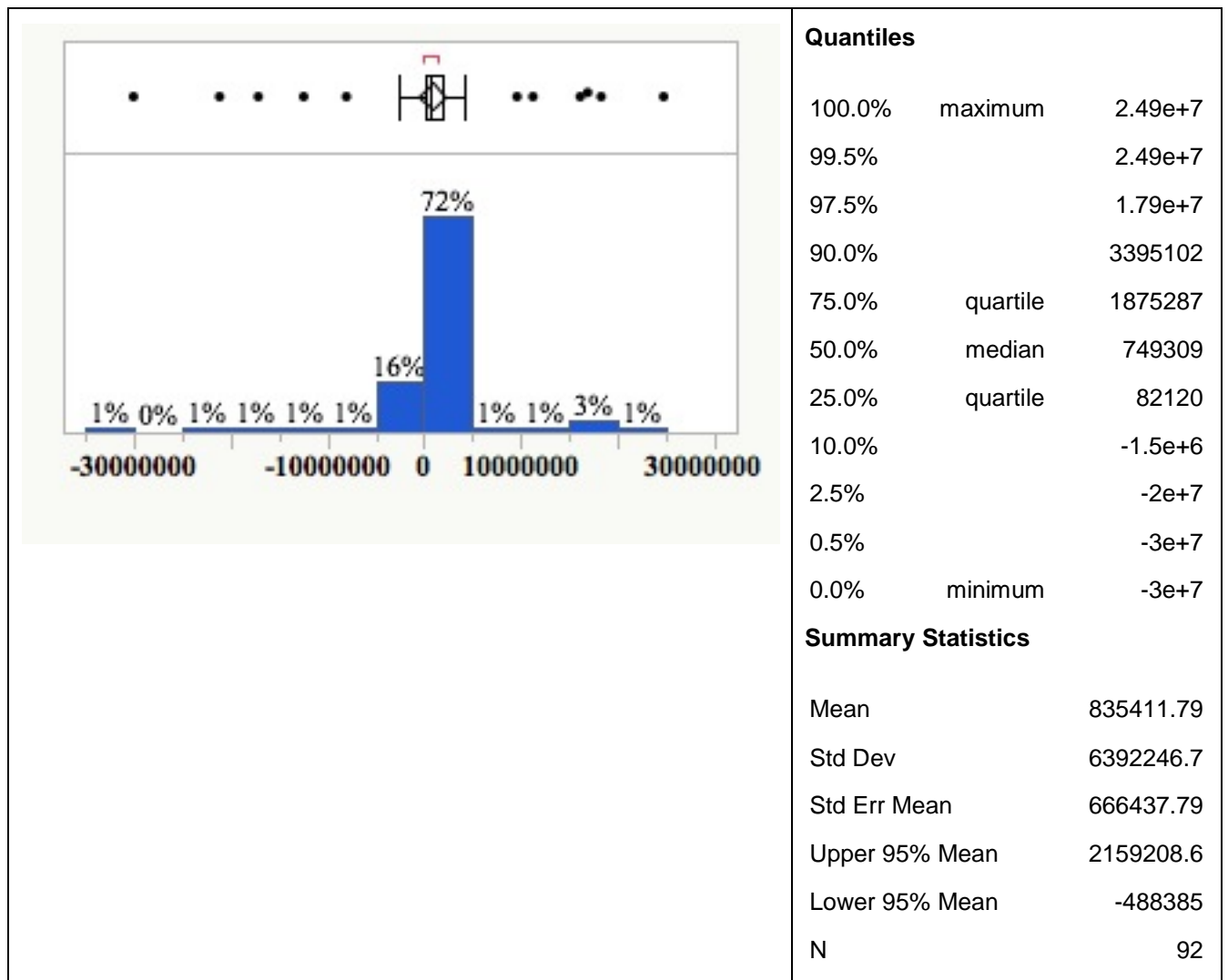
Source: output from the statistical package.

Figure 5.4 is an illustration of how the calculation of the Log has attempted to render the average ROE distribution normal for the purpose of statistical testing. When compared to Figure 5.3, it could be observed that Figure 5.4 is more symmetrical.

5.2.1.5 Average EVA[®]

EVA[®] is one of the independent variables of this study. Its choice has been explained in Section 1.2 and the calculation explained in Section 4.3.3 and illustrated in Appendix 1. Figure 5.5 is a graphical representation of average EVA[®].

Figure 5.5: Histogram and descriptive statistics of average EVA[®]



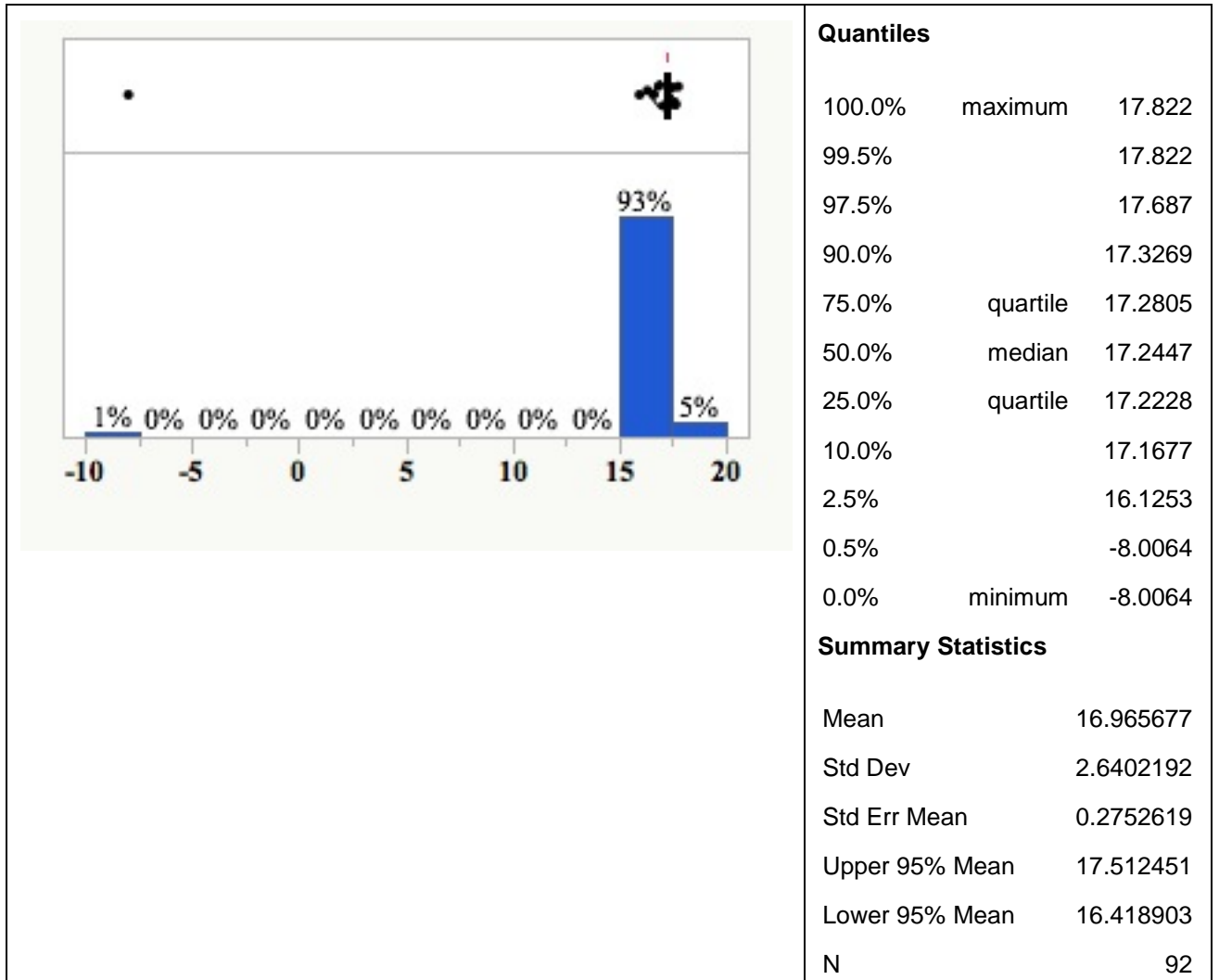
Source: output from the statistical package

The histogram Figure 5.5 confirms the skewedness of the distribution as already seen in the case of the adjusted average share price and average ROE. Therefore the data needed to be normalized with the calculation of Log average EVA[®].

5.2.1.6 Log average EVA[®]

Due to the skewedness in the data observed in Figure 5.5, Figure 5.6 illustrates an attempt to normalise distribution with the use of the Logs.

Figure 5.6: Histogram and descriptive statistics of the Log average EVA[®]



Source: output from the statistical package.

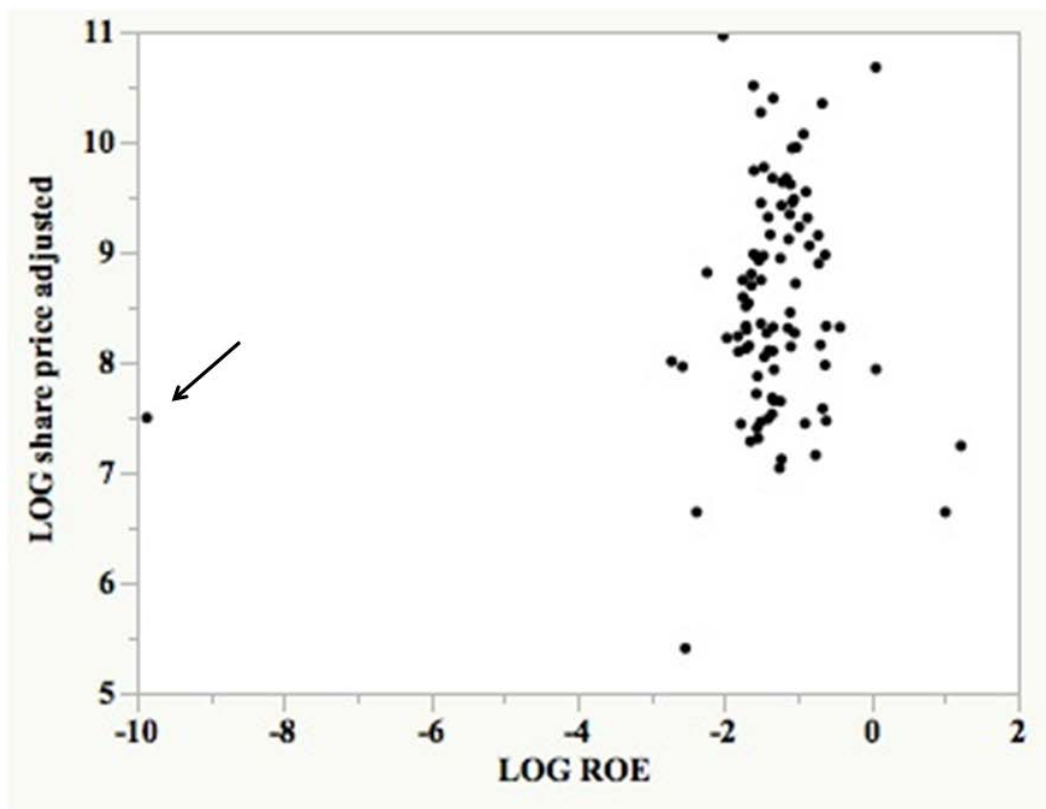
In keeping with the logic established earlier in this section, a constant (33412549.13) was added for the Log calculation. The constant is a conversion of the minimum value on the descriptive statistic portion of Figure 5.5. This was done to eliminate the negative values so to make the calculation of Log average EVA[®] possible.

The discussion in this subsection describes the data and firmly establishes that the study deals with a skew distribution. The data was done without Logs and then with Logs. It can be observed that the Log has not fully normalised the independent variables, the average ROE and average EVA[®], however the dependant variable, the adjusted average share price, has been normalised. Furthermore it was found that the fit with Logs was better than that without Logs. The use of Logs was therefore judged to be necessary for the purposes of normalizing the data set. An investigation will now be conducted to assess any relationship that exists between the average ROE and average EVA[®] as independent variables and the adjusted average share price as the dependent variable.

5.2.2 Investigate the relationship between the average ROE and the adjusted average share price

The goal in this section is to try to assess whether there is a relationship, known as a correlation between average ROE and the adjusted average share price of companies listed on the JSE. According to Hanneman, Kposowa and Riddle (2013), a scatter plot is the best instrument that a researcher could use to visualize the relationship between variables. A scatter plot follows the rules of cross tabulation; a properly built scatter plot enhances its usefulness to the researcher (Hanneman et al, 2013). This serves the purpose of finding a better fit for the data. Figure 5.7 represents the scatter plot using Log average ROE on the X-axis and the Log adjusted average share price on the Y-axis.

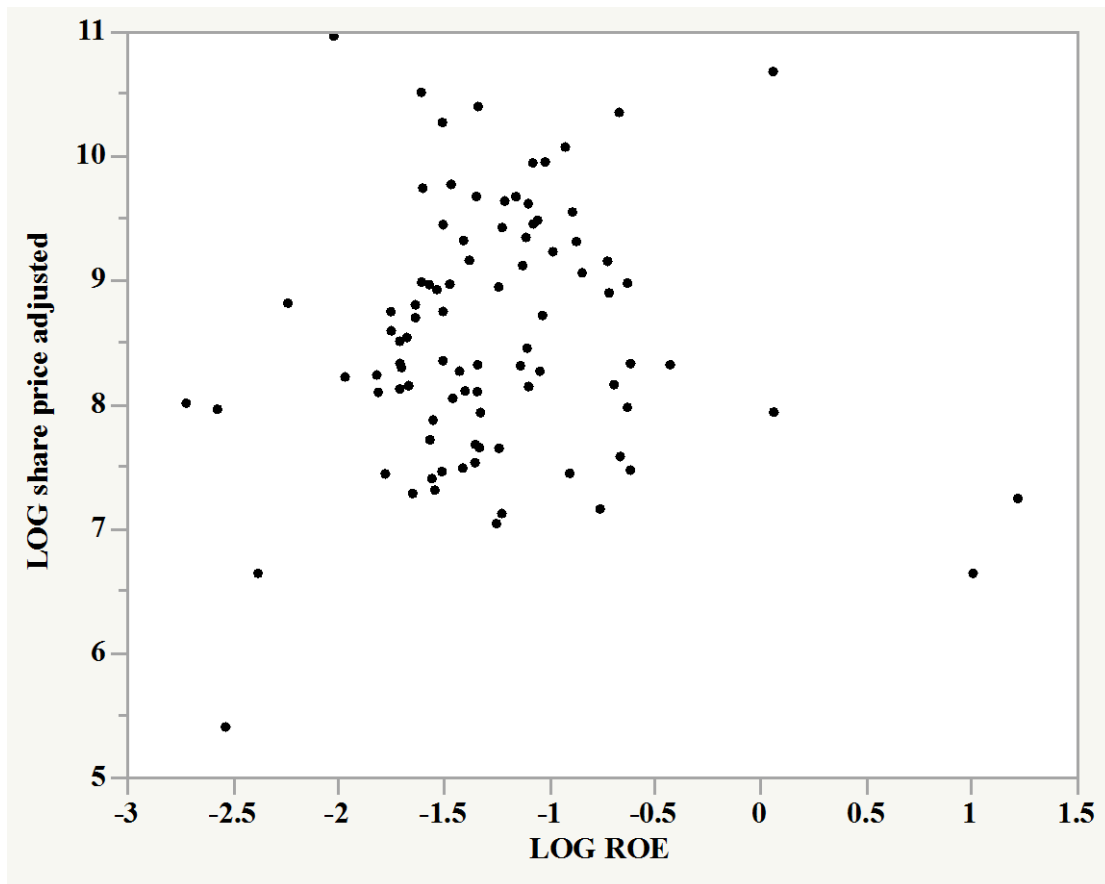
Figure 5.7: Fit Group. Bivariate Fit of LOG adjusted average share price By LOG average ROE (with outliers)



Source: output from the statistical package.

The scatter plot in Figure 5.7 is characterized by the fact that there is a cluster of observations towards the top right side of the graph; however one extreme outlier can also be observed as indicated by the arrow. It can also be observed that there is little movement in ROE on the X-axis. The outlier was then taken out as could be observed on Figure 5.8. Taking out the outlier serves the purpose of finding the relationship amongst the observations.

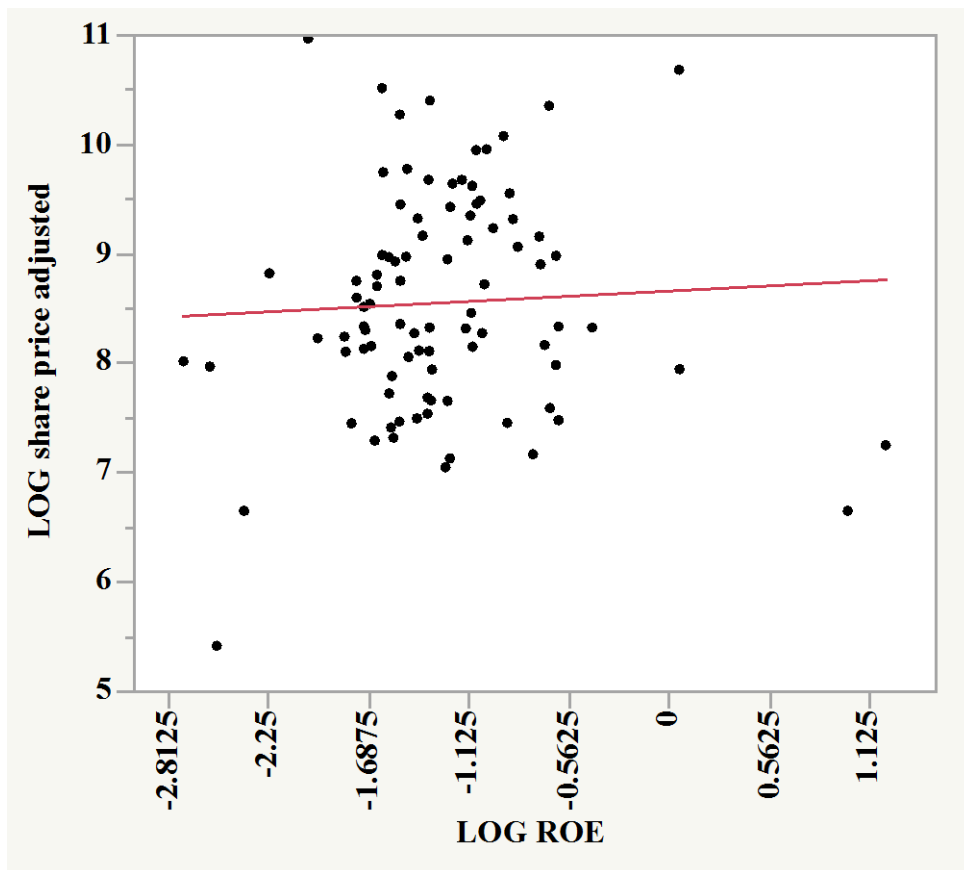
Figure 5.8: Fit Group. Bivariate Fit of LOG adjusted average share price By LOG average ROE (without outlier)



Source: results output from the statistical model.

Figure 5.8 illustrates what will happen to Figure 5.7 if the outlier is taken out. It shows more variation on the X-axis to fit a line. The distribution is better spread and more prone to exploring the relationship between variables. There is no linear relationship between ROE and share price as shown by a non-parametric Spearman correlation analysis ($r=0.13$; $p=0.23$; $n=90$). Just to confirm that there is no linear relationship, a regression line was fitted. Figure 5.9 below is a scatter plot with a linear regression line. The objective is to look for a positive linear or negative linear relationship between variables. It can be observed that there is no fit of the line.

Figure 5.9: Fit Group. Bivariate Fit of LOG adjusted average share price By LOG average ROE



Source: output from the statistical package.

— Linear Fit

$$\text{LOG share price adjusted} = 8.6830484 + 0.1098014 * \text{LOG ROE}$$

Figure 5.9 has visually illustrated the relationship between Log average ROE and Log adjusted average share price. Table 5.1 shows a summary of the fit of average ROE. It presents measures of the goodness of fit.

Table 5.1: Summary of fit average ROE

RSquare	0.002567
RSquare Adj	-0.00877
Root Mean Square Error	1.020451
Mean of Response	8.542391
Observations (or Sum Wgts)	90

Source: output from the statistical package.

The RSquare (R^2) indicated in Table 5.1 is the percentage of variance that is explained by the linear regression, indicating a very weak fit. This means that 0.26% of the adjusted average share price is explained by average ROE. However it is important to assess the significance of the linear relationship between the variables that are being studied. Table 5.2 explores the statistical significance of the linear relationship between Log average ROE and Log adjusted average share price.

Table 5.2: Analysis of variance average ROE

Source	DF	Sum of	Mean Square	F Ratio
Model	1	0.235808	0.23581	0.2265
Error	88	91.636233	1.04132	Prob > F
C. Total	89	91.872041		0.6353

Source: output from the statistical package

Table 5.2 shows the F-test which assesses the significance of the linear regression. In explaining the relationship between average ROE and the adjusted average share price, at 95% confidence, the linear regression was not found to be significant because the P value is greater than 0.05 ($F_{1,89} \approx 0.23$; $p=0.64$). This means that the adjusted average share price is not significantly influenced by the average ROE (0.64). This supports the literature reviewed in Section 3.3. However it was also established in the review of the literature that the fact that ROE does not help predict

the share price has not discouraged investors from using ROE as a performance measurement tool.

After having done the F-test and finding that the relationship between the variables was not statistically significant, the T-test could be done so to assess the significance of the factor ROE. The T-test is not required where there is only one variable, but it was done to follow a consistent approach throughout and to show that the P-value is unchanged as indicated between Tables 5.2 and 5.3. Table 5.3 below summarizes the results of the T-test.

Table 5.3: Parameter Estimates Log ROE

Term	Estimate	Std Error	t Ratio	Prob> t
Intercept	8.6492883	0.249061	34.73	<.0001*
LOG ROE	0.0842579	0.177061	0.48	0.6353

Source: output from the statistical package.

Table 5.3 assesses the statistical significance of the factor (ROE) by performing the T-test. The factor was found not to be significant in explaining the share price. This is illustrated by the P-value at a confidence level of 95% which is unchanged from Table 5.2 and greater than 0.05 ($t(89) \approx 0.48$; $p=0.64$). As stated, the outcome of the T-test is similar to the F-test because there is only one variable.

Based on all the tests performed above it could be said that although a very weak form of correlation could statistically be established between the average ROE and the adjusted average share price, the literature review was actually confirmed as the tests showed that there is no significant relationship between ROE and share prices.

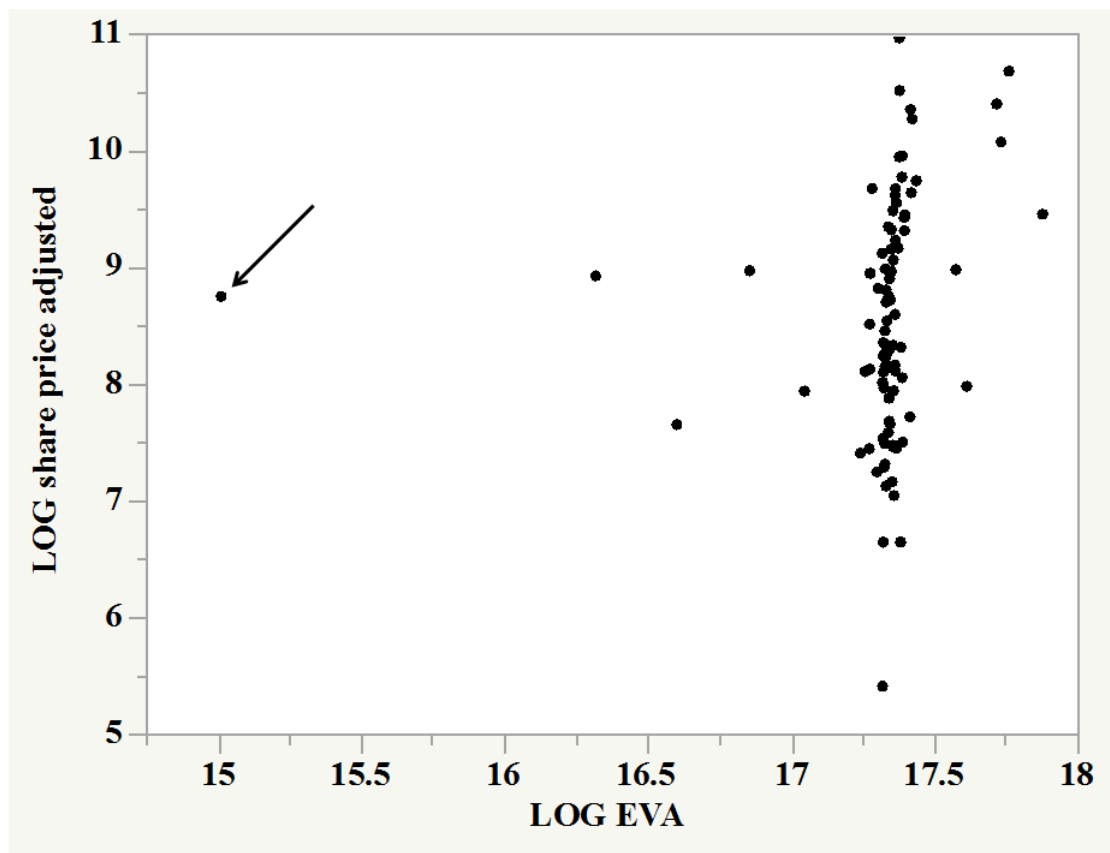
In Section 5.2.3, a series of tests will be done to assess the relationship between the average EVA[®] and the adjusted average share price of JSE listed companies. The tests that follow are similar to those performed in Section 5.2.2, but in that section

the independent variable was the average ROE, whereas in Section 5.2.3, it is the average EVA[®].

5.2.3 Investigate the relationship between average EVA[®] and adjusted average Share Price

What is being tested here is whether there is a correlation between average EVA[®] and the adjusted average share price of companies listed on the JSE. The reasoning behind using the scatter plot in data analysis explained in Section 5.2.2 is also valid and it will not be repeated. Figure 5.10 represents the scatter plot using Log average EVA[®] on the X-axis and the Log adjusted average share price on the Y-axis.

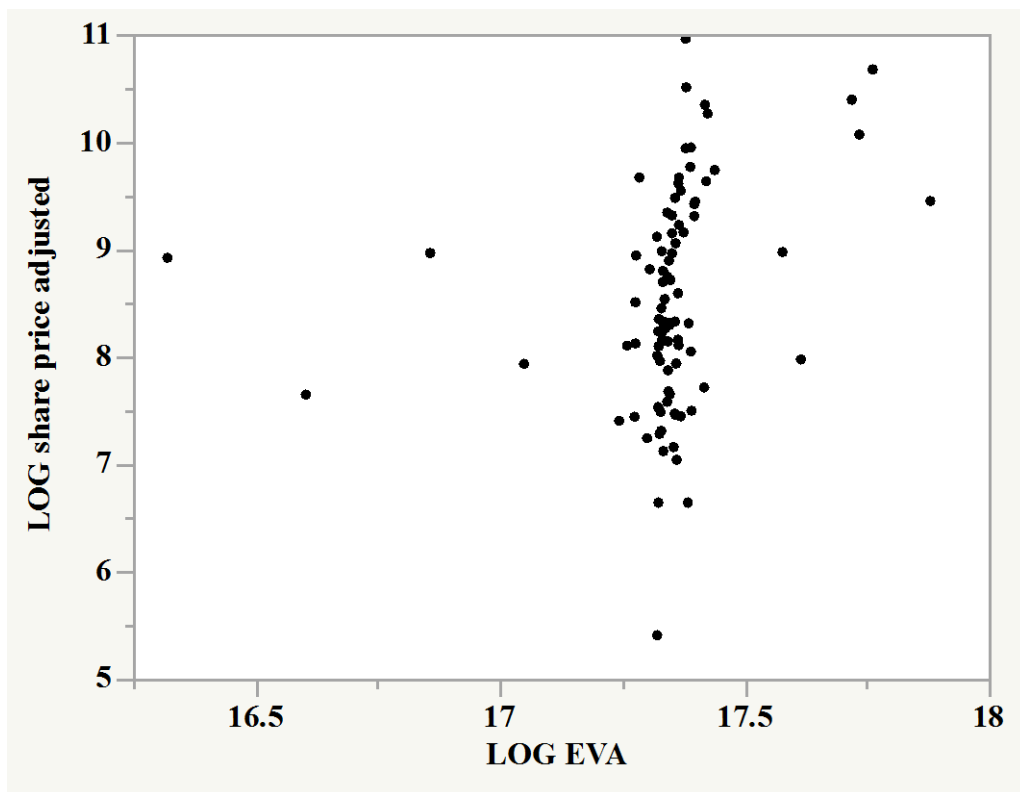
Figure 5.10: Bivariate Fit of LOG adjusted average Share price By Log average EVA[®] (with outlier)



Source: output from the statistical package

Figure 5.10 illustrates the scatter plot using Log average EVA[®] on the X-axis and Log adjusted average share price on the Y-axis. This scatter plot is characterized by the fact that there is a cluster of observation towards the right of the graph, however, as with average ROE, an extreme outlier could be observed as indicated by the arrow. Figure 5.11 assesses the distribution without the outlier.

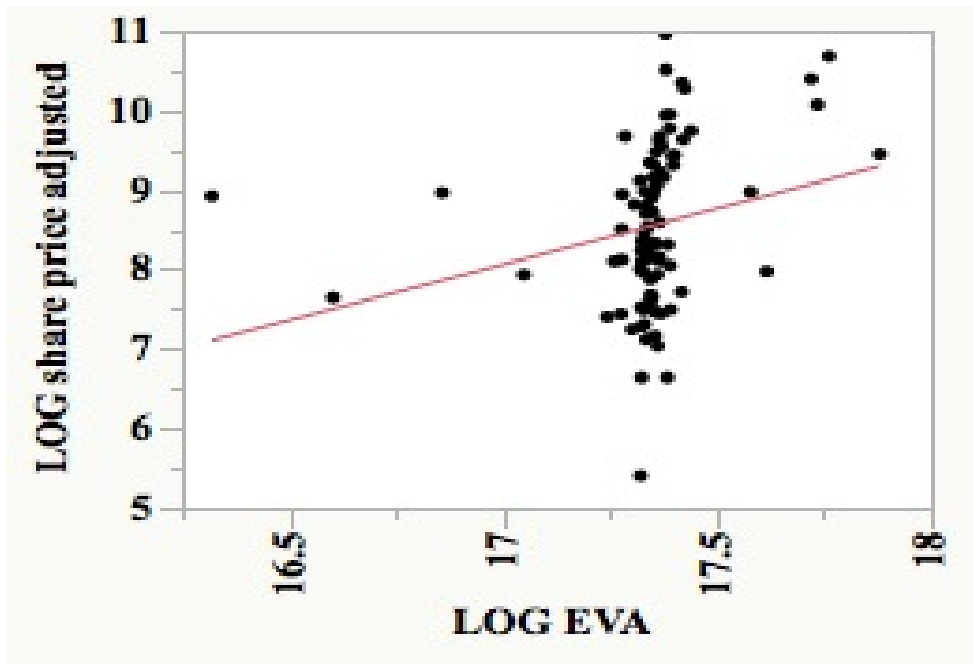
Figure 5.11: Bivariate Fit of LOG share price adjusted By LOG EVA[®]



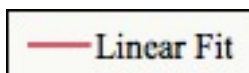
Source: output from the statistical package.

Figure 5.11 shows the scatter plot when the outlier is removed so to achieve a better fit. There is a positive linear relationship between EVA[®] and share price of medium strength as shown by the non-parametric Spearman correlation analysis ($r=0.47$; $p<0.0001$; $n=90$). Figure 5.12 is a scatter plot with the linear regression line in it, so to see how well the line fits the data. With the EVA[®] of the companies centred between 17 and 17.5, there is very little variation left to work with to produce a linear fit. This made the fit of a line in Figure 5.12 difficult.

Figure 5.12: Bivariate Fit of LOG adjusted average share price By LOG average EVA[®]



Source: output from the statistical package



Linear Fit

$$\text{LOG share price adjusted} = 1.1185737 + 0.4281119 \cdot \text{LOG EVA}^{\circledR}$$

After a visual illustration of the relationship between Log average EVA[®] and adjusted average share price in Figure 5.10, Figure 5.11 and Figure 5.12, Table 5.4 shows a summary of the fit of EVA[®].

Table 5.4: Summary of Fit EVA[®]

RSquare	0.062594
RSquare Adj	0.051942
Root Mean Square Error	0.989269
Mean of Response	8.542391
Observations (or Sum Wgts)	90

Source: output from the statistical package

The RSquare (R^2) indicated in Table 5.4 is the percentage of variance that is explained by the linear regression, meaning that 6.26% of the adjusted average share price is explained by average EVA[®]. Like in the case of average ROE, it is important to assess the significance of the linear relationship between the variables that are being studied. Table 5.5 explores the statistical significance of the linear relationship between Log average EVA[®] and Log adjusted average share price.

Table 5.5: Analysis of Variance EVA[®]

Source	DF	Sum of	Mean Square	F Ratio
Model	1	5.750650	5.75065	5.8761
Error	88	86.121392	0.97865	Prob > F
C. Total	89	91.872041		0.0174*

Source: output from the statistical package

The F-test in Table 5.5, meant to test the significance of the linear regression, found average EVA[®] to be significant in explaining adjusted average share price. This is because the P-value is smaller than 0.05. This means that adjusted average share price is significantly influenced by average EVA[®] (0.0174). This is in line with the literature reviewed in Section 3.4, that strongly suggests that there is a link between EVA[®] and the share price of listed companies, as indicated by authors such as Stewart (1991), Ray (2012) or Bhasin (2012), to name but a few. As stated earlier, after performing the F-test, the T-test was done for consistency and to show that it will agree with the F-test. Table 5.6 evaluates the parameter estimates of Log EVA[®].

Table 5.6: Parameter Estimates LOG EVA[®]

Term	Estimate	Std Error	t Ratio	Prob> t
Intercept	-15.81479	10.04861	-1.57	0.1191
LOG EVA	1.4043415	0.579333	2.42	0.0174*

Source: output from the statistical package

The T-test in Table 5.6 tests the significance of the factor (EVA[®]). Average EVA[®] was found to be significant in explaining the adjusted average share price. This is because the P value is smaller than 0.05, further showing that the share price is significantly influenced by EVA[®] (0.0174). The next section will test the effect of the interaction between average ROE and average EVA[®] on adjusted average share price of JSE listed companies.

5.2.4 Investigate the effect of average ROE and average EVA[®] and the interaction of the two on adjusted average share price

The correlations between ROE, EVA and share price were already investigated previously as shown by the non-parametric Spearman correlation analyses in 5.2.2 and 5.2.3. There is a positive linear relationship between EVA[®] and ROE of medium strength as shown by the non-parametric Spearman correlation analysis ($r=0.34$; $p=0.001$; $n=90$).

The regression of average ROE and average EVA[®] is meant to assert whether there is a relationship between the interaction of average ROE and average EVA[®] on one hand and the adjusted average share price of listed companies on the other. Multiple linear regression analyses was therefore performed for the period of the study. This is because in this section both independent variables are being evaluated together. The tabular illustrations of the outcome of the evaluation are presented below in Tables 5.7 to 5.9.

Table 5.7 presents the summary for the whole model. Contrary to what was done when evaluating the variables independently, R^2 adjusted will be the measure here because both variables are being combined.

Table 5.7: Summary of Fit ROE and EVA[®]

RSquare	0.111562
RSquare Adj	0.08057
Root Mean Square Error	0.974218
Mean of Response	8.542391
Observations (or Sum Wgts)	90

Source: output from the statistical package

Table 5.7 represents measures of goodness of fit R^2 adjusted. R^2 adjusted is the percentage of variance that is explained by the linear regression. This means that that 8.06% of the adjusted average share price is explained by the interaction of average EVA[®] and average ROE. To confirm this, a further test was performed to assess the significance of the model in explaining the share price as illustrated in Table 5.8.

Table 5.8: Analysis of Variance ROE and EVA[®]

Source	DF	Sum of	Mean Square	F Ratio
Model	3	10.249463	3.41649	3.5997
Error	86	81.622578	0.94910	Prob > F
C. Total	89	91.872041		0.0167*

Source: output from the statistical package

The F-test shown in Table 5.8 confirms the statistical model was found to be significant because the P-value is smaller than 0.05 ($F_{3,89} \approx 3.60$; $p=0.0167$). That means ROE, EVA[®] and the interaction between the two is significant in explaining

the share price of JSE listed companies. In order to test the effect of the independent variables individually, T-tests were performed as could be seen in Table 5.9

Table 5.9: Parameter Estimates Log ROE + Log EVA[®]

Term	Estimate	Std Error	t Ratio	Prob> t	Std Beta	VIF
Intercept	-14.38586	10.08142	-1.43	0.1572	0	.
LOG ROE	-0.029933	0.172672	-0.17	0.8628	-0.018	1.0434517
LOG EVA [®]	1.3166018	0.579252	2.27	0.0255*	0.234557	1.0308476
(LOG ROE+1.26869)*(LOG EVA [®] -17.3442)	3.1016833	1.426191	2.17	0.0324*	0.223594	1.023183

Source: output from the statistical package

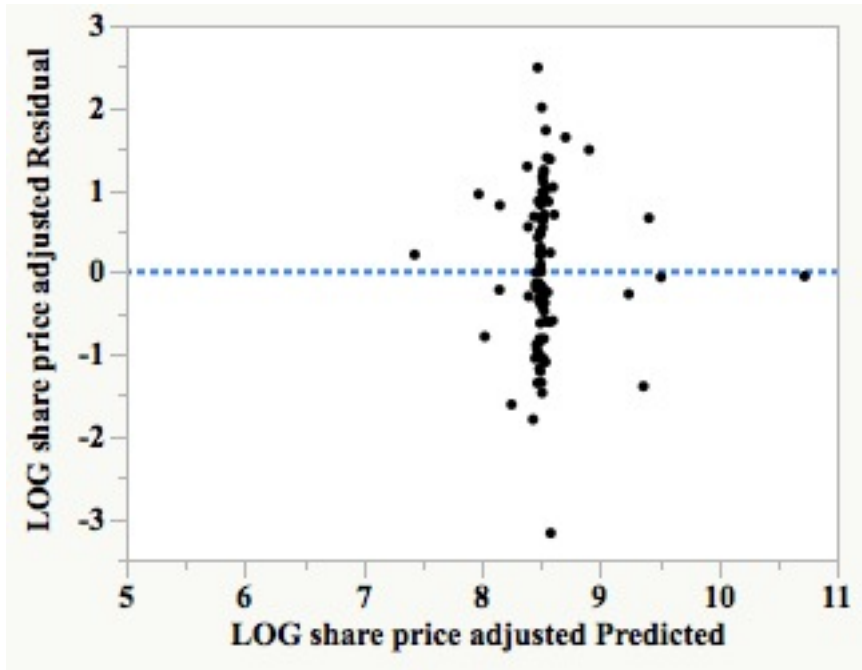
The T-tests summarized in Table 5.9 is testing the significance of the individual variable as well as the interaction between the two, the factors ROE and EVA[®]. Average ROE was found not to be significant because the P value is larger than 0.05 ((t (89) \approx -0.17; p=0.8628). Average EVA[®] was found to be significant, at a 95% level of confidence, because the P value is smaller than 0.05 ((t (89) \approx 2.27; p=0.0255).

The interaction between average ROE and average EVA[®] was found to be significant, at a 95% level of confidence, because the P-value is smaller than 0.05 ((t (89) \approx 2.17; p=0.0324). This means that the share price is significantly influenced by EVA[®] as well as the interaction between ROE and EVA[®]. This is the main finding of this study

The linear regression analyses have established that EVA[®] as well as the interaction between ROE and EVA[®] explains 8.06% of the movement of the share price of JSE listed companies. It is acknowledged that share price could be influenced by many more factors; however this study focussed only on ROE and EVA[®]. Furthermore it is important to test the reliability of the statistical model used to get to these conclusions. The residual by predicted plot was used for that purpose. The residual is the difference between the actual value and the expected value: namely the error. The residual by predicted plot is a diagnostic of nonlinearity or no constant error

variables; its purpose is to validate the model (Frost, 2012). Figure 5.13 represents the residual by predicted plot of the model.

Figure 5.13: Residual by Predicted Plot



Source: output from the statistical package

No pattern could be observed in Figure 5.13, as the residual are centred on zero, therefore it can be concluded that there are no patterns in the residual. Based on the discussion of the residuals by predicted plot the assumption of random residuals seems to be fair.

5.3 SUMMARY

This chapter has presented the research findings. Firstly a discussion on the characteristics of the population was undertaken. Out of the initial 100 companies only 92 made it to the study, with gold mining companies specifically excluded because of the declining nature of that industry. The reasons for other exclusions were also discussed. In addition when analysing the distribution, it was found that the distribution was skewed, however it was established that the skewedness of the

distribution was inherent to financial data. To normalize the data for statistical exploitation the use of natural Logarithm was proposed.

The model used was a multiple linear regression analysis that was constructed to examine whether average ROE and average EVA[®] have any influence on the movement of adjusted average share price of JSE listed companies. In statistics, a linear regression analysis is a technique that helps analyse numerical data. It aims to assert how good an independent variable is in predicting changes in a dependent variable. The linear regression is further used to determine the extent to which there is a linear relationship between a dependent and an independent variable.

To achieve the goals of the model, the discussion on the data was followed by an investigation of a possible relationship between average ROE and the adjusted average share price of JSE listed companies. In that process it was found that in statistics, a scatter plot is used to assist the researcher have a visual picture of possible relationships between the variables that are studied. After a number of tests that included an F-test and a T-test, it was established that ROE was insignificant when it came to explaining the share price of JSE listed companies. The same exercise was repeated using average EVA[®]. It was found that EVA[®] was significant in explaining the share price of JSE listed companies.

It should be highlighted that the literature review in Chapter 3 has shown that there are benefits that individual investors could derive by using ROE and EVA[®] as tools to help in the investee selection process. However, the main objective of this study was to see whether the interaction of the two metrics could be advantageous to the individual investors. The multiple linear regression analyses were then performed on the data. The result of the multiple linear regression analyses showed conclusively that there is a significant relationship between EVA[®] and the interaction of ROE and EVA[®] on one side and share price of JSE listed companies on the other, therefore statistically supporting their usefulness to individual investors.

The F-test and the T-test showed that 8.06% of the movement in share price of listed companies could be explained by the interaction of ROE and EVA[®]. This is considered to be important when put in context. It could be recalled that Section 1.2 discussed a study which listed 28 possible internal variables that could influence the share price of listed companies. When you add to that all the external factors that could at one point or another influence the movement of the share price of listed companies, it could be asserted that pinning down 8,06% of the movement of share price to two specific variables is significant indeed. These findings imply that adding additional variables to the model would impact on the interaction between the variables used in this study.

This chapter has provided a statistical backing to the assertion that the interaction between ROE and EVA[®] could be useful to individual investors when assessing the performance of JSE listed companies. The technique used to get to the conclusion is believed to be statistically sound since the residual by predicted plot did not show any autocorrelation between the variables that was being studied. The next chapter will present the conclusions and the recommendations of this study.

CHAPTER 6 : CONCLUSIONS AND RECOMMENDATIONS

6.1 INTRODUCTION

For the purpose of this study, academic literature has been extensively reviewed, and a thorough empirical investigation was also conducted with the aim of solving the research problem. This chapter starts by giving a brief overview and the focus of the study this will be followed by a presentation of the conclusions of this study, final comments and the limitations of the study will follow. The chapter will end with recommendations and suggestions for possible future research.

6.2 OVERVIEW OF THE BACKGROUND TO AND FOCUS OF THE STUDY

In chapter 1, the landscape of the economic environment was laid for individual investors. It was indicated that the capitalist system is prone to crisis. Furthermore, shareholders as owners of companies often find themselves grappling with agency issues in their relations with company's management; from time-immemorial humans have always found ways of measuring the performance of business enterprises. Company performance measurements were identified as tools individual investors had at their disposal to measure the performance of a company and then be in a position to make informed decisions based on those performance measurements.

It was later identified that for the purpose of decision-making, investors needed to be well informed on what was happening within a company. The quality of the information available to individual investors was therefore investigated. The study findings were that, high quality information was necessary for individual investors as this information would assist them in their decision-making process.

The main assertion of this study as presented in Section 1.5 is that the interaction between a company's ROE and EVA[®] could assist individual investors in having a better understanding of a company's performance and therefore inform better decisions on their side. Therefore as stated in Section 1.4, the main objective of this

study was to investigate, with the help of statistical modelling, if an individual investors could be able to take a meaningful decision based on their knowledge of the effect of the interaction of ROE and EVA[®] on a company's share price. However the study set itself two other objectives that are directly linked to the main one. These were investigating individual investor's sources of information on companies and investigating ROE and EVA[®] as suitable performance measurement tools for individual investors. It was believed that meeting these objectives would help individual investors make better decisions on JSE listed companies therefore narrowing the gap between company performance as stated in their financial statements and their performance on the stock exchange.

6.3 CONCLUSIONS

This section presents the outcome of this study. This will be done by assessing whether the objectives set out in Section 1.4 have been met. Therefore each individual research objective will be placed in a rectangle, and below that the discussion pertaining to it.

- | |
|--|
| 1- Identify individual investors' sources of information, when assessing JSE listed companies. |
|--|

In chapter 2 of this study, a literature review was conducted so as to meet the above objective. Because this study focused on investing in JSE listed companies, the above objective was designed to assist individual investors identify sources of information on listed companies.

To do that, investing was initially defined so as to establish a theoretical foundation of the concept. Investing was found to mean the use of one's personal savings towards a venture in the hope of making a profit. Whatever the reasons for investing

may have been, it was established in Section 2.2 that the overall aim was for investors to increase their wealth. It was therefore found in the literature reviewed in Section 2.3, that the stock exchange was a convenient avenue to invest in as it was relatively cheap to do so, and because it could be a good source of additional income for households. However the gain that could be made by investing in listed companies could be offset by the possibility of making losses. The literature review established that it was advisable to invest for the long term, as patience is required when investing in listed companies.

As illustrated in Section 2.3, individual investors could find comfort in the fact that stock exchanges operate in a regulated environment that gives some protection to the investors. In the case of the JSE, it was found to compare favourably with its counterparts around the world in terms of its listing requirements and in terms of the use of new technologies for conducting trade.

It was deemed necessary to identify possible sources of information for individual investors. It was established that financial statements were the primary source of information on companies. It is a legal requirement in South Africa, for companies to make financial statements available to the public. Moreover, innovation such as integrated reporting, that magnifies the concept of sustainability could enhance the usefulness of the corporate report, as they go beyond the traditional financial statements by presenting not only the economic results of a company, but also the environmental and social impact of a company integrated in a so called triple bottom line paradigm. Individual investors would also enhance their knowledge of the operations of a company by using other sources of information as discussed in Section 2.4.3, including SENS, the financial media and social networking that has also been presented as a growing new source of information on companies. However, individual investors should be careful when considering information from social networks such as Twitter or Facebook as they usually reflect the personal opinions of the individuals posting them.

This discussion shows that the first objective has been met, as individual investors have been equipped with information that could better their understanding of the

workings of a stock exchange and further enhance the trust in the JSE as a credible avenue from which they could do business.

2 Investigate the concepts of ROE and EVA[®] as performance measurement tools for individual investors when making JSE investee decisions.

To meet the second objective, a detailed literature review canvassed the views on ROE and EVA[®] as performance measurement tools for individual investors, were conducted in chapter 3.

To understand where ROE and EVA[®] came from, a discussion on accounting-based and value-based performance measurement tools was conducted. This was necessary because ROE and EVA[®] are not stand alone concepts; they form part of the bigger pool of performance measurement tools that are said to be accounting-based for ROE and value-based for EVA[®]. The reasoning behind the choice of these two tools was presented in Section 1.2 and in Section 3.2. Accounting-based tools are said to use financial statements in order to derive performance indicators of a company, whereas value-based tools focus on the shareholders' value creation theories to determine the performance of a company.

ROE in Section 3.3 was found to be a ratio of net income on equity. The study found that ROE was popular in the investing community because it gave an indication of how management of a company have used the funds of investors intrusted to them. The financial analysts on their side see the expansion of ROE into the DuPont equation as a useful development. An opportunity was afforded to them to pin point what the drivers of ROE may have been. Was it net profit margin, total asset turnover ratio or the financial leverage multiplier effect? Whether it is for investors or

for analysts, the familiarity and availability of ROE was found to be one of the reasons that justify its continued use despite its inerrant flaws.

The discussion was carried forward with EVA[®]. EVA[®] as a performance measurement tool was found to be a reflection of the value created or destroyed by the company. EVA[®] was defined as the return over and above the cost of capital employed to create such a return. In other words a company will only be deemed to have created value if it has provided a return that is above the cost of capital that was employed to produce it. EVA[®] was found to be appealing as it highlights the fact that the investor's capital was not free. Measuring the performance of a company based on the value creation concept was encouraged. The pioneering work of Joel M. Stern and the consulting company Stern Stewart & Co in developing and making EVA[®] a household name in academia and industry was also highlighted.

Conceptually ROE and EVA[®] were found to be usable as performance measurement tools. The discussion on their individual advantages and disadvantages found that the benefits of using these tools outweigh the disadvantages. It could therefore be said that the second objective has been met since a comprehensive discussion on ROE and EVA[®] has been done highlighting their usefulness as possible performance measurement tools for individual investors.

3 - Explore with the help of a statistical construct, whether knowledge of the interaction of a company's ROE and EVA[®] could form a better basis for individual investors in making decisions on investments on JSE listed companies, than either of the two metrics standing alone.

The empirical study aimed to use statistical modelling to see if the outcome of the literature review could be statistically confirmed, regarding the usefulness of ROE and EVA[®] to individual investors. The population of this study was companies listed on the JSE. However, only the Top100 companies in terms of market capitalisation was considered for the study, the reasoning behind that choice was explained in Section 4.3. To achieve the above objective it was further decided that a correlation and a linear regression analyses were better suited for that purpose.

Appendix 1 shows a table representing how ROE and EVA[®] were calculated. The average share price used has also been brought in from Appendix 3. Appendix 1 was the main input to the statistical model that was built. ROE and EVA[®] were tested for a period of three years, 2010 to 2012, with the adjusted average share price of companies, the share price being adjusted for inflation. Tests were conducted to:

- Explore if the movement in average ROE could explain the movement in the adjusted average share prices of listed companies. It was found that there was a very weak correlation between average ROE and the adjusted average share price. ROE was therefore found not to be statistically significant in explaining the movement of share price.
- Repeat the previous test but using average EVA[®]. Here average EVA[®] correlated with the adjusted average share price; however it was also found that a significant relationship existed between EVA[®] and the share price of listed companies.
- Assess whether the interaction of average ROE and average EVA[®] could explain the adjusted average share price. The results were significant as it

showed that not only was there a correlation between the interaction of the two tools with the share price, but also their interaction was found to be statistically significant, therefore, confirming the central assertion of this study as expressed in the thesis statement in Section 1.5.

It could already be seen that individual investors could derive additional benefits by combining ROE and EVA[®] when making decisions on a JSE listed company. Therefore it could be asserted that the third objective has been met. Overall all three objectives of this study have been met as could be seen in the discussions in this section. It could be asserted that meeting all the objectives of this study means that the problem that his study seeks to solve has been resolved. The main argument of this study was that, the interaction of a company's ROE and EVA[®] could assist individual investors in having a better understanding of a company's performance and therefore informs better decision-making on their side has been confirmed.

6.4 FINAL COMMENTS

In conclusion this study has firstly contributed to the body of knowledge by identifying a mix of information sources and metrics that could assist individual investors in their decision-making process on shares in JSE listed companies. Secondly, as far as could be established, this could be the first time that a study has been done to explore whether the interaction of two performance measurement tools, namely ROE and EVA[®] could contribute to the investment decision of individual investors in South Africa.

Ultimately this study has shown that there is a synergy between ROE and EVA[®] in using them as performance measurement tools and that the interaction of ROE and EVA[®] explain 8.06% of the movement in the share price of listed companies, all things being equal. Therefore the interaction between ROE and EVA could be part of a range of tools at the disposal of individual investors as they go about assessing investees or potential investees. Thus the overall aim of this study has been achieved.

6.5 LIMITATIONS OF THE STUDY

Taking into account the discussions in section 1.6 and 4.3, and knowing that no human activity is perfect, the findings of this study are limited by its context. Only the Top100 companies were used and for a limited period of three years. Possibly expanding the number of companies and the time period could have yielded different outcomes.

6.6 RECOMMENDATIONS

It is recommended that, in addition to other performance measurement tools, the interaction of ROE and EVA[®] be used by individual investors when evaluating the performance of an investee or a potential investee. It is further recommended that companies make ROE and EVA[®] readily available to individual investors as part of normal corporate reporting.

6.7 SUGGESTIONS FOR FURTHER STUDIES

While working on this study, the following possible research avenues were identified. These avenues are:

- Research could be conducted in combining other performance measurement tools to see whether a different combination of these would better explain the changes in the share price of companies.
- Research could also be conducted on the motivation of individual investors in South Africa as there seems not to be a specific study that deals with the psychology of a South African individual investor.
- Research could also be conducted on the JSE policy with regards to attracting individual investors. As this study mentioned that the government is encouraging individuals to use the JSE as a saving mechanism, it suggests

that people are not making use of it. Research could find out why and how to remedy the situation.

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APPENDIXES

THE ATTACHED CD: JTMPHIL-CD

A CD containing the appendices has been enclosed. This contains the data collected mainly from the McGregor BFA and other sources. The appendices were the input to the statistical model for this study. JTMPHIL-CD is an audit trail of the outcome of this study. JTMPHIL-CD is available for the print version only however all the appendices are available electronically. Below is the list of the appendices:

- Appendix 1: JSE data. ROE & EVA[®] calculations (CD)
- Appendix 2: Inflation rates
- Appendix 3: Average share price calculations (CD)
- Appendix 4: Top100- 2010 to 2012
- Appendix 5: WACC steps on McGregor BFA
- Appendix 6: Research ethics approval

Appendix 2: Inflation rates table

Year	Average inflation rate
2010	4.1%
2011	5.01%
2012	5.72%

Source: http://www.treasury.gov.za/comm_media/press/2002/2002121301.pdf

<http://www.inflation.eu/inflation-rates/south-africa/historic-inflation/cpi-inflation-south-africa-2013.aspx>


Appendix 4 : List of companies


List of companies

- 1 ABL - African Bank Investments Limited
- 2 BGA - Barclays Africa Group Limited
- 3 FSR - Firstrand Limited
- 4 INL - Investec Limited
- 5 NED - Nedbank Group Limited
- 6 RMH - Rmb Holdings Limited
- 7 SBK - Standard Bank Group Limited
- 8 DST - Distell Group Limited
- 9 SAB - Sabmiller Plc
- 10 AEG - Aveng Limited
- 11 MUR - Murray & Roberts Holdings Limited
- 12 PPC - Ppc Limited
- 13 WBO - Wilson Bayly Holmes-Ovcon Limited
- 14 OMN - Omnia Holdings Limited
- 15 SOL - Sasol Limited
- 16 BAW - Barloworld Limited
- 17 CFR - Compagnie Financiere Richemont Sa
- 18 REM - Remgro Limited
- 19 RLO - Reunert Limited
- 20 BAT - Brait Se
- 21 PSG - Psg Group Limited
- 22 AVI - Avi Limited
- 23 ILV - Illovo Sugar Limited
- 24 OCE - Oceana Group Limited
- 25 RCL - Rcl Foods Limited
- 26 TBS - Tiger Brands Limited
- 27 TON - Tongaat Hulett Limited
- 28 SHF - Steinhoff International Holdings Ld
- 29 APN - Aspen Pharmacare Holdings Limited
- 30 MDC - Mediclinic International Limited
- 31 NTC - Netcare Limited
- 32 TSH - Tsogo Sun Holdings Limited
- 33 SUI - Sun International Limited
- 34 DTC - Datatec Limited
- 35 LBH - Liberty Holdings Limited
- 36 MMI - Mmi Holdings Limited
- 37 OML - Old Mutual Plc
- 38 SLM - Sanlam Limited
- 39 NPN - Naspers Limited
- 40 AGL - Anglo American Plc
- 41 ARI - African Rainbow Minerals Limited
- 42 ASR - Assore Limited
- 43 BIL - Bhp Billiton Plc
- 44 HCI - Hosken Consolidated Investments Ltd

45 MPC - Mr Price Group Limited
46 NPK - Nampak Limited
47 AMS - Anglo American Plat Ltd
48 IMP - Impala Platinum Holdings Limited
49 LON - Lonmin Plc
50 NHM - Northam Platinum Limited
51 SAP - Sappi Limited
52 GRT - Growthpoint Properties Limited
53 HYP - Hyprop Investments Limited
54 RDF - Redefine Properties Limited
55 ITU - Intu Properties Plc
56 CPL - Capital Property Fund
57 TFG - The Foschini Group Limited
58 HDC - Hudaco Industries Limited
59 IVT - Invicta Holdings Limited
60 MSM - Massmart Holdings Limited
61 CLS - Clicks Group Limited
62 PIK - Pick N Pay Stores Limited
63 PWK - Pick N Pay Holdings Limited
64 SHP - Shoprite Holdings Limited
65 CPI - Capitec Bank Holdings Limited
66 GND - Grindrod Limited
67 IPL - Imperial Holdings Limited
68 TRE - Trencor Limited
69 WHL - Woolworths Holdings Limited
70 BVT - The Bidvest Group Limited
71 ACL - Arcelormittal South Africa Limited
72 DSY - Discovery Limited
73 SNT - Santam Limited
74 MTN - Mtn Group Limited
75 INP - Investec Plc
76 CML - Coronation Fund Managers Limited
77 TRU - Truworths International Limited
78 RES - Resilient Property Income Fund Ltd
79 TKG - Telkom Sa Soc Limited
80 SPP - The Spar Group Limited
81 EXX - Exxaro Resources Limited
82 KIO - Kumba Iron Ore Limited
83 MND - Mondi Limited
84 MNP - Mondi Plc
85 PFG - Pioneer Food Group Limited
86 AIP - Adcock Ingram Holdings Limited
87 REI - Reinet Investments S.C.A
88 BTI - British American Tobacco Plc
89 NEP - New Europe Property Investments Plc
90 VOD - Vodacom Group Limited
91 CCO - Capital & Counties Properties Plc

92	LHC - Life Healthcare Group Holdings Ltd
93	RBP - Royal Bafokeng Platinum Limited
94	RMI - Rand Merchant Insurance Hldgs Ltd
95	RIN - Redefine Prop International Ltd
96	ANG - Anglogold Ashanti Ltd
97	GFI - Gold FIELDS Ltd
98	HAR - Harmony Gm Co Ltd
99	ATT - Attacq Limited
100	RPL - Redefine International Plc

 Companies ignored because of insufficient information

 Gold companies ignored as explained in chapter 4

 Outliers

Appendix 5: Regarding WACC

Regarding WACC, please note the steps below:

1. Log into Research Domain
2. Select Financial Models
3. Select All Companies from the drop down list and also All Boards
4. Select WACC and Submit
5. Now you can click between companies as seen below or export a specific company to excel:

COLLEGE OF ACCOUNTING SCIENCES
RESEARCH ETHICS REVIEW COMMITTEE

23 October 2014

Ref #: 2014_CAS_0013
Name of applicant J Totowa
(researcher):
Student #:34321497
Staff #:

Dear Mr Totowa,

Decision: Ethics Approval

Name: Mr J Totowa, Department of Management Accounting, jtotowa@hotmail.com,
0827385908

Proposal: Return on equity and Economic Value-Added™ as an aid for decision-making to
investors: an exploratory study

Qualification: Postgraduate degree

Thank you for the application for research ethics clearance by the College of Accounting
Sciences Research Ethics Review Committee for the above-mentioned research. Final
approval is granted for the duration of the project.

For full approval: *The application was reviewed in compliance with the Unisa Policy on
Research Ethics by the College of Accounting Sciences RERC on 11 September 2014.*

The proposed research may now commence with the proviso that:

- 1) The researcher/s will ensure that the research project adheres to the values and principles expressed in the UNISA Policy on Research Ethics.*
- 2) Any adverse circumstance arising in the undertaking of the research project that is relevant to the ethicality of the study, as well as changes in the methodology, should be communicated in writing to the College of Accounting Science Research Ethics Review Committee. An amended application could be requested if there are substantial changes from the existing proposal, especially if those changes affect any of the study-related risks for the research participants.*
- 3) The researcher will ensure that the research project adheres to any applicable national legislation, professional codes of conduct, institutional guidelines and scientific standards relevant to the specific field of study.*

4) [Stipulate any reporting requirements if applicable].

Note:

The reference number [top right corner of this communiqué] should be clearly indicated on all forms of communication [e.g. Webmail, E-mail messages, letters] with the intended research participants, as well as with the CAS RERC.

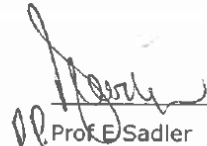
Kind regards,



Prof HC Wingard

Chair: CAS RERC

wingahc@unisa.ac.za



Prof E Sadler

Executive dean

24/10/2014