AN ANALYSIS: WEALTH CREATION BY THE INDUSTRIAL COMPANIES LISTED ON THE JOHANNESBURG STOCK EXCHANGE OF SOUTH AFRICA, 2005-2014

OKE, OJI OKPUSA

Student number: 212127284

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Supervisor: Dr. John Beneke

Co-supervisor: Mr I. Mudhombo

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DECLARATION

I, Oke Oji Okpusa (Student No. 212127284), hereby declare that this dissertation for the award of Master of Technology (Cost and Management Accounting) at the Vaal University of Technology, Vanderbijlpark, is my own work and that it has not previously been submitted for assessment to another university or for another qualification and all material contained herein has been duly acknowledged.

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Signed **Date**

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ABSTRACT

Numerous studies have been conducted to ascertain factors that impact on wealth creation of companies. It has been suggested by various researchers that economic value added (EVA) could be used to measure company wealth creation and a number of factors have been suggested that contribute to wealth creation for company shareholders.

The purpose of this study is to determine the company characteristics that influence wealth creation. The study uses EVA, the dependent variable, as a measure of a company's wealth creation. The company characteristics, independent variables, are operating capital size, capital gearing, export and domestic distribution market segments, sub-sectors and the type of product companies release into the market. Identifying company characteristics that influence wealth creation could enlighten investors on where capital should be directed in order to maximise wealth creation for the companies' shareholders and the entire economy.

Logistic regression analysis models were used to analyse 61 industrial companies listed on the Johannesburg Stock exchange (JSE) for the 10-year period of 2005 to 2014. The use of logistic regression for this analysis was necessitated by the binary nature of the data (EVA positive or negative) and logistic regression analysis is suitable for such binary data. A series of tests were conducted to assess the suitability of logistic regression analysis in evaluating the impact of company characteristics on EVA. The classification accuracy test, which shows the predictive accuracy or the forecast strength of the logistic regression model for this study yielded a forecast strength of the highest of 97.2 percent for 2006 and lowest of 63.2 percent for 2014. The results indicated the appropriateness of the logistic regression model for the study.

The data on the EVA of companies were collected from INET-BFA. Other sets of data also obtained from INET-BFA include companies' volume of operating capital, capital gearing, company product types, distribution channels and sub-sectors to which each company belongs. The historical inflation and exchange rates were also obtained and applied in comparing with EVA. The comparison was to determine if there was any relationship between EVA, exchange rates and inflation.

Results of the logistic regression analysis model reveal that the sub-sector factor, capital size factor and capital gearing factor impact on EVA, while market segment and company product type do not impact on EVA. The results show that the sub-sector categories of manufacturing, retail and extraction have significant positive impact on EVA while property management does not impact on EVA. The large capital category of the capital size factor shows significant positive impact on EVA while the medium capital category shows a negative impact on EVA, leaving small capital size having no impact on EVA. The high as well as moderate capital gearing categories of the capital gearing factor show negative impact on EVA, while low gearing shows no impact on EVA. However, some years covered in the study did not have any significant factors.

Results of wealth creation evaluation of the industrial companies using EVA as a metric reveals that the industrial companies created more value than was destroyed in terms of EVA. The results show that manufacturing, extraction and retail sub-sectors achieved net positive EVA, while the property management sub-sector achieved net EVA negative in the 10-year period. Furthermore, results of EVA comparison with foreign exchange and inflation rates indicated a relationship between EVA, exchange rate and rate of inflation. The results show that as inflation rises, foreign exchange depreciates, while EVA performance of companies drops during the same period.

Findings and recommendations of this study are important to company managers as they offer crucial information regarding the types of activities organisations could engage in and for investors to consider the types of businesses in which to invest. The findings are also important in suggesting how companies could organise their capital structure as well as the size of the capital in order to optimise wealth creation. Such considerations by company managers and investors alike would help to increase wealth creation within the economic system.

This study made use of five company characteristics, which were stated into various categories. Additional company characteristics should be used in a further study to identify other company attributes that may impact on EVA. There is also the need to carry out further studies using other methods to find out if different results could be achieved. In addition, a study is recommended to establish why no significant factor was identified in some of the years.

Keywords: economic value added, stakeholders, industrial, multi-functional organisations, intrinsic market value, company characteristics, logistic regression

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LIST OF ABBREVIATIONS

AEVA	Adjusted economic value-added
ALTX	Alternative exchange
BV	Book value
BVA	Book value-added
CAPM	Capital asset pricing model
CD	Debt capital
CE	Capital employed
CFROI	Cash flow return on investment
CMVE	Market value of equity
CODESRIA	Council for the Development of Social Science Research in Africa
CPI	Consumer price index
CVA	Cash value-added
DCM	Development capital market
DFL	Degree of financial leverage
DOL	Degree of operating leverage
DPS	Dividend per share
EBDIT	Earnings before debt interest and tax
EP	Economic profit
EPS	Earnings per share
ER	Earnings ratio
EVA	Economic value-added
FCF	Free cash flow
FTSE	Financial Times Stock Exchange
GAAP	Generally accepted accounting principle
GDP	Gross domestic product
IAS	International Accounting Standard
IC	Invested capital
ICAEW	Institute of Chartered Accountants of England and Wales
ICB	Industrial classification benchmark
IFRS	International Financial Reporting Standard
JSE	Johannesburg Stock Exchange
LIFO	Last-in first-out

LSE	London Stock Exchange
MVA	Market value-added
NOPAT	Net operating profit after tax
NPV	Net present value
OCFD	Operating cash flow demand
OCF	Operational cash flow
OR	Odds ratio
P/E	Price-earnings ratio
REVA	Refined economic value added
RI	Residual income
ROA	Return on asset
ROCE	Return on capital employed
ROE	Return on equity
ROI	Return on investment
RONW	Return on net worth
ROPG	Rate of profit growth
ROS	Return on sales
SP	Share price
SPE_S	Special purpose entities
SPSS	Statistical Package for the Social Sciences
SPV_S	Special purpose vehicles
StMR	Stock market returns
SVA	Shareholder value-added
TC	Total capital
VBM	Value-based management
VCM	Venture capital market
WACC	Weighted average cost of capital

CHAPTER 1

OVERVIEW OF THE STUDY

1.1 INTRODUCTION

Accounting provides both financial and non-financial information to assist decision makers to make sound financial choices (Drury 2015:4). Drury (2015:4) has stated that accounting communicates economic information to various parties (stakeholders), both internal and external to the organisation. While internal stakeholders require information to assist in financial and operational decision-making and to enhance business activities, external stakeholders require information on the value of their investments, amongst other important parameters.

The industrial revolution of the 19th century witnessed the development of management accounting practices, which were in use up to the 1980s (Johnson & Kaplan 1987:24). Advances in management accounting occurred in the 20th century due to the growth of multi-functional, diversified organisations (Waweru 2010:166). Here, managers are responsible for individual divisions, senior management teams concern themselves with coordinating various activities, developing and directing strategic goals as well as deciding on capital allocation to investment units (Waweru 2010:166).

Maelah (2010:161) maintains that due to globalisation and growth of information technology, management accounting theories and practices became obsolete in providing cost and performance measurement system's information. Buresova and Dvorakova (2014:3) state that performance evaluation of business enterprises had been by the application of traditional indicators based on profit and variables of profit. However, in the last few years, trends have moved to new metrics, a change necessitated by the fall of big enterprises such as Enron (Buresova & Dvorakova 2014:3). One of these new approaches is economic value-added (EVA) to evaluate company performance (Chiwamit, Modell & Yang 2014:145). The aim of this study has been to determine company characteristics that impact on wealth creation by the industrial companies listed on the Johannesburg Stock Exchange (JSE) over a ten-year period to December 2014 using EVA as a metric for measuring wealth created.

1.2 THEORETICAL FRAMEWORK

The theoretical framework serves as the blueprint or guide that defines how a dissertation would be "philosophically, epistemologically, methodologically and analytically approached" (Grant & Osanloo 2014:12). A theoretical framework is made up of the selected theories underpinning and guiding a researcher's plan as to how to research the topic, including the relevant concepts and definitions regarding the topic (Grant & Osanloo 2014:12). The framework for this study has been based on thematic and empirical reviews. Du Plooy-Cilliers, Davis and Bezuidenhout (2015:102) describe thematic review as the review that focuses on different schools of thought and empirical review as one that focuses on various methodologies used and then summarises any empirical evidence for the phenomenon under study. This study discusses different schools of thought on EVA and company characteristics, including different methodologies applied by earlier researchers on the subject.

Furthermore, the theoretical framework used as a basis for this study is the set of ideas, concepts and opinions that provide understanding of EVA as a tool for measuring the wealth creation ability and consequently, financial performance of corporate entities. The theoretical framework provides a brief discussion of the background, definition, advantages as well as the disadvantages of EVA. In addition, the concept of company characteristics and the possible influence on wealth creation is considered in this study.

1.2.1 Background discussion

Van der Poll, Booyse, Pienaar, Buchner and Foot (2011:124) point out that the goal of all companies is to create value for shareholders and to use various measurements that tally with the company's value to measure the extent of value created. According to Van der Poll *et al*. (2011:124), measurements that may be employed include:

- Earnings or return on investment (ROI) – an accounting variable;
- Market share – a marketing variable;
- Cash-flow return on investment (CFROI) – a cash-flow variable;
- Economic value added (EVA).

Sharma and Kumar (2010:206) state that EVA is recognised as an important tool of performance measurement and management all over the world, particularly in advanced economies who have adopted it as a corporate strategy. It has been suggested that EVA is more appropriate and applicable in capital-intensive environments such as manufacturing, than in organisations that rely on intellectual capital (Van der Poll *et al.* 2011:129-130). Therefore, it may be concluded that EVA is suitable for use by industrial companies listed on the JSE, including the manufacturing sector and capital-intensive industries.

In a study of 44 companies, Weldon (2013:28) analysed the expected relationship between EVA and future earnings. The results suggested a correlation between EVA and turnover. Previously, Shil (2009:174) observed the following limitations of EVA:

- EVA is a short-term performance measure;
- The EVA of long-term investments can only be subjectively estimated, not objectively measured, because future returns cannot be measured;
- EVA is not suitable for measuring the performance of companies that have invested heavily today and expect positive cash flow in the distant future;
- A company may have a lot of undepreciated new assets in its balance sheet and yet shows negative EVA even if the business could be quite profitable in the long run;
- Traditional financial ratios are better suited for distress prediction, as EVA does not reveal any incremental value in predicting future outcomes (Shil 2009:174).

Notwithstanding the shortcomings enumerated above, the results of the study carried out by Weldon (2013:28) suggest that EVA is suitable for measuring wealth creation by industrial companies. Consequently, any company characteristics that impact on EVA invariably impact on company wealth creation.

1.2.2 Definitions of EVA

Van der Poll *et al*. (2011:125) maintain that EVA shows the value of an organisation's economic profit. Economic profit being the value created over and above the rate of return required by a company's shareholders (Van der Poll *et al.* 2011:125). Therefore, EVA is a reflection of the net profit of the organisation minus the cost of financing the

organisation's capital, all of which is calculated after making adjustments to the generally accepted accounting principles (GAAP) book values and deducting the cost of equity capital (Van der Poll *et al.* 2011:125).

EVA seeks to improve and measure efficiency and value creation (Rago 2008:7). Rago (2008:7) suggests that EVA is a measure tying directly to intrinsic market value, measuring the difference between profits derived by a company from its operations and the costs of capital that the company incurs using its credit lines. Shil (2009:169) states that EVA is a value-based performance measure, focusing on the importance of value creation by management for shareholders. Shil (2009:169) goes further to argue that the concept of profit and wealth maximisation is outdated, while value maximisation is the current vogue.

Sharma and Kumar (2010:201) describe the EVA of a company as a measure of the incremental return that the investment generates over the market rate of return. In other words, EVA measures the difference between economic profit and cost of capital (Sharma & Kumar 2010:201). However, Philips (2007:5) describes EVA as pointing to the notion that companies do not earn a true profit until all costs, including items such as opportunity costs and cost of capital, have been accounted for. Philips (2007:5) goes further to explain that showing a profit on the income statement is not enough and that the amount of earnings must also cover the benefit foregone by using resources in a particular manner.

1.2.3 Definition of company characteristics

Company characteristics, for the purpose of this study, are defined as the attributes, qualities, possessions, relationships and operational activities that distinguish one company from another within the industry, including the characteristics the companies have in common. Examples of company characteristics are the size of operating capital, capital gearing as well as local and international market segments where companies sell their products and services. Others are product types of industrial and household consumable goods as well as the sub-sector that includes manufacturing, extraction, retailing and property management.

1.3 PROBLEM STATEMENT

Johnson and Kaplan (1987:22) note that the existing management accounting systems fail to provide the relevant set of measures that adequately reflect the technology, products, processes and the competitive environment within which the organisation operates. Johnson and Kaplan (1987:22) further state that financial managers tend to rely heavily on periodic financial statements for their evaluation of the company and fail to recognise when the accounting numbers are no longer providing relevant and appropriate measures of the organisation's performance. Jusoh, Rudyanto and Haslida (2012:43-44) echo the view expressed by Johnson and Kaplan (1987:22). Jusoh *et al*. (2012:43-44) state that traditional financial ratios have worked well in the past as important tools for measuring organisational performance. Their relevance in the present information age in which the market has no financial boundary (a case of global village) and where organisations are in competition with each other, therefore, is questionable (Jusoh, Rudyanto & Haslida 2012:43-44). It may not be out of place to conclude that the authors mentioned above are of the opinion that the competition among organisations intensified by globalisation requires different tools for measuring performance.

Kaur and Narang (2008:40) state that traditional measures do not reflect the real value of the shareholders. Consequently, EVA should be measured scientifically to have a real idea about shareholder value. More recent studies in developed economies show a weak correlation between accounting profit and share price movements and suggest that the thrust of modern management style is to find means to create value for the owners (Ray 2012:260-261).

Some of the traditional performance measuring tools described include earnings per share (EPS), return on assets (ROA) and return on equity (ROE) (De Wet 2012:63). It is postulated by De Wet (2012:63) that these tools do not reflect the risk involved to a company as encapsulated in the cost of own capital (equity). Furthermore, they are prone to manipulation by company managers (De Wet 2012:63). According to Brigham and Ehrhardt (2007:6), the primary objective of managers of a corporation is to create wealth to enhance shareholders' value. Brigham and Ehrhardt (2007:6) also suggest that some managers might deliberately mislead investors by positioning their

companies to appear more valuable than they truly are. Brigham and Ehrhardt (2007:8) further state that the real wealth of a company is reflected in the size of its free cash flow (FCF), which is cash that is freely available for distribution to its shareholders and creditors after all operating and financing costs have been deducted from revenues generated. A challenge arises in determining how companies in South Africa create and measure wealth. The challenge of determining the appropriate tool for measuring wealth is coupled with identifying company characteristics that impact on wealth creation.

EVA, a trademark of Stern Stewart & Co., has been developed as a tool that organisations can use to measure their financial performance (Fraker 2006). In the opinion of Ray (2012:261), the implementation of a complete EVA-based financial management and incentive compensation system will provide managers with quality information that could result in decisions that would create wealth for shareholders in any publicly- or privately-owned organisation.

Despite the high volume of research activity on EVA, the contribution that EVA has made in creating value for shareholders and the suitability of EVA for various economic sectors, EVA, however, seems not to have been widely used in South Africa (Van der Poll *et al*. 2011:124). Weldon (2013:8) demonstrated that companies in South Africa still use EVA sparsely. The studies of Van der Poll *et al*. (2011:124) and Weldon (2013:8) suggest that many companies in South Africa are still relying on the traditional performance measurement tools. This situation still exists even though the system is found to be inadequate in measuring the real value created by companies. It may, therefore, be argued that many South African companies, including those listed on the JSE industrial sector, may not be providing adequate information relating to real value creation.

Moreover, identifying appropriate measuring tools of wealth creation is not enough without determining the key company characteristics that impact on company wealth creation. Identifying company characteristics that impact on wealth creation would enlighten investors on where capital should be directed in order to maximise wealth creation for companies and the whole economy.

1.4 RESEARCH OBJECTIVES

The objectives of this study are divided into primary and secondary objectives.

1.4.1 Primary objective

The primary objective of the research is determining the company characteristics that impact on wealth creation by the industrial companies listed under the industrial sector of the JSE for the period 2005 to 2014.

1.4.2 Theoretical objectives

In order to achieve the primary objective, the following theoretical objectives were accomplished by a review of the literature on:

- The concept of wealth creation
- Evolution of value-based management
- Business performance measurement
- Traditional tools for measuring wealth creation
- The concept of economic value added
- The concept of company characteristics and effect on EVA
- Exchange rates, inflation and relevance on EVA.

The objective was to understand the publication and conclusions of such literature reviewed. The reviewed literature thus, provides insight into the subject of value creation and measurement and the relevance in the South African environment.

1.4.3 Empirical objectives

In order to accomplish the primary objective, the following empirical objectives were carried out:

- Ascertain if the company's capital gearing impact on EVA.
- Identify if the company's size of operating capital impact on EVA.
- Determine if the company market segment of local and international distributions impact on EVA.
- Investigate if the product type of industrial and household consumables impact on EVA.

- Establish if the sub-sector to which a company belongs impact on EVA.
- Analysis of the extent of wealth created by the companies using EVA as a metric.
- Investigation of the relationship of EVA, inflation and exchange rates.

1.5 RESEARCH DESIGN AND PROCEDURE

The research design is a plan, structure and strategy of investigation so arranged as to help obtain answers to study questions (Kumar 2014:122). The research design provides direction as to:

- Format of data collection;
- Companies selected and criteria for their selection;
- Specific data collection technique;
- identification of features that define company characteristics;
- Data analysis and presentation;
- Study result dissemination.

To obtain the required data, analyse and interpret the research findings to answer the research questions, the following procedures were applied:

1.5.1 Literature review

A literature review was conducted in order to obtain information relating to the research problem. The literature are critically reviewed such that the outcome of the study has been discussed with the appropriate and relevant background. The review of the literature was conducted in a way to obtain the theoretical as well as the empirical overview of the subject matter. The literature also provides a discussion on the historical background, definitions, merits and demerits of EVA. Empirical evidence has been provided based on previous studies on the calculations and adjustments as applied by Maditinos, Sevic and Theriou (2006:19).

The concept of company characteristics and their influence on wealth creation was explored and critically analysed in the literature review. Furthermore, the literature ensures a comprehensive study of the application, appropriateness and a comparison between EVA and other traditional measurement techniques. Overall, the literature review was conducted in order to “compare the research findings with those of others”

(Kumar 2014:48). In-depth analyses of journals, textbooks, conference proceedings and blogs, as well as JSE publications were undertaken.

1.5.2 Data and methodology

The research involved the application of the EVA metric to analyse standardised company data in order to identify those that created value compared to those that did not. To obtain information systematically that helps understanding the phenomenon of company wealth creation, together with company characteristics that impact on EVA, an applicable research method was used. The applicable method was derived from the literature review of methodologies and the most suitable method for analysis of JSE listed companies was used**.** The method applicable to this study was the quantitative research technique. Rajasekar, Philominathan and Chinnathambi (2013:9) describe a quantitative research method as:

- Based on measuring of quantity or amount;
- A process that may be described in terms of quantities, which may result in a number or a set of numbers;
- One that uses numbers with the application of statistics or mathematics;
- A process that involves the evaluation of evidence;
- The results are often presented in tables, charts as well as, graphs;
- It can be applied in physical sciences, economics, social sciences and biology (Rajasekar *et al.* 2013:9).

The current study assessment is to identify company characteristics that impact on wealth creation by industrial companies listed on the JSE using EVA as a measure of company wealth. The study takes processes that used monetary data, mathematical and statistical formulas for evaluating trends/outcomes of company performances as suggested by Rajasekar *et al.* (2013:9). Trend analysis helped to understand past and present performances regarding company characteristics that impact on EVA among the population group (Kumar 2014:153).

1.5.3 Study population and sample frame

The population of this study are all the JSE listed industrial companies as provided on INET-BFA platform as at 31 December 2014. The choice is informed by the assertion of Van der Poll *et al*. (2011:129-130) that EVA is suitable for capital-intensive companies, of which the population of this study are characterised. The industrial companies selected were those listed and remain listed for the ten-year period covered by the study and whose results are equally available for the period.

1.5.4 Data collection

Data collection was by means of secondary sources. Secondary data are the set of data that already exists and is available for extraction for the purpose of a study (Kumar 2014:171). Those sources that provide secondary data are also referred to as secondary sources (Kumar 2014:171). The financial statements and interpretations of the companies, together with other data necessary to the study, were obtained from INET-BFA. The data are in the public domain and are readily available. Therefore, it was not necessary to obtain permission from the relevant companies to use the freely available information. The use of this platform for data gathering for this study is because of the availability, standardisation and reliability of data published thereon.

1.6 DATA ANALYSIS

Data analysis involved obtaining industrial companies' EVA already calculated in accordance with the formula similar to Kaur and Narang (2008:41) and provided on INET-BFA. The EVA was classified into positive or negative and to be denoted as one or zero respectively. Industrial companies were classified and, then categorised into sub-sectors: manufacturing, extraction, retailing and property management; capital size: small, medium and large; product types: industrial raw materials, household consumables, equipment and appliances and service firms; market segments: export, domestic and mixed. However, gearing was classified in line with De Wet and Hall (2004:45) into high, medium and low.

Analysis to determine company characteristics that influenced EVA using logistic regression analysis model was carried out. The reason for using this statistical tool is

because logistic regression analysis is well suited for describing and testing for any relationship between a categorical outcome variable and one or more categorical or continuous predictor variables (Peng, Lee, & Ingersoll 2002:3). The purpose for identifying company characteristics impacting on EVA of industrial companies is to advise investors where capital should be directed in order to maximise wealth creation.

1.7 ETHICAL CONSIDERATIONS

In this study, ethical considerations involved "taking care to avoid harming people (including legal persons), having due regard for their privacy, respecting them as individuals" (Goddard & Melville, 2013:49). In order to achieve these objectives, the following ethical issues were adhered to:

- Ensuring the use of appropriate research methodology in order to enhance reporting;
- Names of the companies used in the study were not revealed in any format;
- Data collected have been used strictly for the purpose of this study and no identifier of companies has been applied;
- Published results standardised by INET-BFA do not require ethical clearance by the companies under investigation.

1.8 CHAPTER CLASSIFICATION

In order to present the information gathered in the course of this study in a manner that would make for easy identification of parts of the report, the following arrangement has been employed:

Chapter 1 An introduction and overview of the study is presented. A brief discussion of the research design, statistical analysis, as well as ethical issues relating to the study have also been incorporated therein.

Chapter 2 Literature review. This chapter contains the review of the literature, which discusses the theories and concepts underlying the use of EVA in measuring value created or destroyed by company managers. The literature also highlights the concept of company characteristics and the probable impact on value creation.

Chapter 3 Research methodology. This chapter elaborates on the research design and the method of data collection applied. Sampling and data analyses techniques have been presented as well.

Chapter 4 Analyses, data interpretation and research findings. Data collected in the course of the study were analysed, interpreted and presented along with the research findings.

Chapter 5 Conclusion and recommendations. The research activities have been summarised and conclusions drawn. In addition, recommendations that surfaced from the study have been stated alongside the limitations encountered and issues requiring further study.

1.9 SUMMARY

This chapter gives an overview of the study. The chapter contains the concepts and framework that underlie the study, definitions of the key concepts and problem statement. The chapter also contains the research objectives, the research design, data definition, data collection and data analysis methods. The latter part of the chapter illustrates the issues of ethical consideration and chapter classification. The next chapter, the review of the relevant literature, discusses the theories and concepts of the traditional and the modern methods of measuring value of companies, the concept of company characteristics and the probable impact on value creation, as well as, the relationship between EVA, inflation and exchange rates.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

The previous chapter discussed the background study objectives and the theoretical framework. This chapter, containing the review of the relevant literature, discusses the theories and concepts underlying the application of the traditional as well as the modern methods of measuring company value created or destroyed. The literature also highlights the concept of company characteristics and the probable impact on value creation. The literature further provides insight into the relationship between EVA, inflation and exchange rates. The review of literature explores validity of EVA as a corporate performance evaluation metric in the South African Stock Market within the African, as well as, the global contexts. This validation may allow investors and other company stakeholders to consider EVA as a tool for investments and other corporate decisions.

Investing in any business is with the expectation that there would be an increase in the original capital outlay together with a reasonable return of profits (Cunha-Pinto & Machado-Santos 2011:70). Many tools are available to assess the profitability of a particular business. The tools could be separated into traditional and value-based measures. The traditional measures are stated as return on equity (ROE),return on assets (ROA), earnings per share (EPS) and return on investments (ROI), while the value-based techniques are economic value added (EVA) and market value added (MVA) (Maditinos *et al*. 2009:330; Sharma & Kumar 2012:806; Issham 2013 1758; Panigrahi, Zainuddin & Azizan 2014:281). However, Cunha-Pinto and Machado-Santos (2011:70) observe that some of the tools used as indicators of value creation may contain some limitations, as they are mostly concerned with accounting profits without considering the overall costs of all capital employed such as equity and debt.

The assertion concerning limitations of traditional performance measurement tools necessitates the quest for an appropriate performance measuring tool that could guarantee reliability and confidence in the results the tools generate. This is in view of the cases where companies that were taken to be profitable using certain measures,

suddenly became insolvent like Enron and WorldCom. Enron used a technique called mark-to-market accounting (Investopedia 2016). This is a technique where company stocks are recognised at their prevailing market price rather than the historical price; an approach commonly used by the company in order to hide its true performance results when huge losses were incurred. This was in addition to their use of off-balance-sheet special purpose vehicles (SPVs) described also as special purpose entities (SPEs) (Investopedia 2016). SPEs were used by the company to cover its huge liabilities together with the "toxic assets" from providers of capital (Investopedia 2016). WorldCom, on the other hand, had a manipulation of reserves of $3.3bn together with improper reporting of expenses of $3.8bn as capital investments (Tran 2002:1-2).

2.2 CONCEPTS OF PERFORMANCE MEASUREMENT AND VALUE ADDED

Performance measurement systems play an important role in the running of any business entity (Okwo & Marire 2012:48). Performance management systems involve using different measures to collect and report information regarding the performance of an individual, group or organisation (Okwo & Marire 2012:48). The usefulness of measuring how a company has performed is to evaluate the results of the company's operations as presented in the published accounts, which is a major factor that compels an organisation's managers to implement the organisation's pre-determined business plan and to pursue its strategic goals to realise the requirements of the stakeholders in the business (Okwo & Marire 2012:48). This view was earlier expressed by Behn (2003:586) and supported by Serrat (2010:3). Behn (2003:586) and Serrat (2010:3) suggest that managers could apply the tool of performance measurement for budgeting, motivating, controlling, promoting, celebrating achievement, learning and improving on their own efficiency. Hamidah (2015:1) states that measuring the outcome of a company's operations gives capital providers the information needed to evaluate the viability as well as the financial health of the business.

Performance evaluation is the comparison of attained performance with the set standard (Ristic & Babalan 2006:36). Misankova (2016:1) suggests that finding the ideal concept for managing and measuring business performance is a complex

problem. Misankova (2016:1) further states that experts from consulting companies, business managers and the academia have been leading various discussions on the issue of the right tool to measure company value.

Since the introduction of trade, the concept of value was used in all areas of business endeavours (Vidrascu 2015:65). Vidrascu (2015:65) suggests that economists had used different ways to define and measure the economic value of an asset. The focus was estimating the value of an individual and then extended to merchandise for exchange. Furthermore, Vidrascu (2015:65) and Mikołajek-Gocejna (2017:44) suggest that value creation and measurement have several forms, which have been identified as:

- Profit indicators (economic and financial profitability);
- Indicators based on cash flow and CFROI;
- Indicators of value such as EVA and MVA.
- Total shareholder return (TSR)

Sloof and Van Praag (2015:78) suggest that economists had long realised that measuring value of a company's performance results should be based on comparing what the company earns with the capital injected in generating the earnings. Sloof and Van Praag (2015:78) observe that numerous techniques, which could be described as residual income (RI) based measures, were applied in measuring the values created by companies in twentieth century. Residual income is what remains after deducting cost of capital and corporate taxes from the profit (Sloof & Van Praag 2015:78; Milinovic 2014:28).

Vislwanath (2010:34) suggests that managers of companies in the United States had been perceived by investors as focusing mainly on short-term performance results reflecting EPS, rather than thinking about creating value for shareholders. Vislwanath (2010:34) also suggests that academicians were known to argue that managers of US corporations did not embark so much on long-term investments. This was because of what Vislwanath (2010:34) described as "pressure from Wall Street", which resulted corporations being disadvantaged in world markets. Vislwanath (2010:34) concludes that Stern Stewart & Co. introduced EVA as a reaction to the assertion that American

companies focus on short-term performance rather than long-term performance of companies.

In 1890, Marshall (1890:244) states that an industry would certainly liquidate if it fails to earn enough returns on invested capital in addition to covering its daily operational costs. Marshall (1890:244) further states that a company must earn an amount that is greater than the costs of all invested capital for the company to generate wealth for the owners. Al Mamun and Abu Mansor (2012:311), therefore, argue that EVA evolved due to the works of Marshall in 1890. Al Mamun and Abu Mansor (2012:311) reveal that General Electric had used the tool described as residual income for measuring performance in 1920.

2.3 EVOLUTION OF VALUE-BASED MANAGEMENT (VBM) AND THE EVA CONCEPT

Value-based management (VBM) is a management system, which changes company decisions by focusing on shareholder value (Cozmiuc & Petrisor 2016:1). Cozmiuc and Petrisor (2016:1) state further that value-based management is an interdisciplinary approach built with financial management, strategic management, investor relations and management accounting and it involves a holistic approach to company management, covering value creating strategies, value drivers, action plans and performance appraisals. Cozmiuc and Petrisor (2016:1) reveal that value-based management emerged in the 1990s and was implemented by companies such as Hewlett Packard, Cadbury and Coca-Cola.

Alam and Nizamuddin (2012:161) state that the origin of the value added concepts date back to the early 1900s. However, Alam and Nizamuddin (2012:161) argue that Stern Stewart & Co introduced and trademarked EVA in1990s and that its subsequent adoption by several major corporations led to its popularity. Panigrahi *et al.* (2014:281) state that Stern Stewart & Co. reintroduced EVA after its decline in use following the initial adoption by General Motors in 1920.

Cunha Pinto and Machado-Santos (2011:71) observe that the traditional techniques for measuring the performance of companies is still being significantly recognised by stakeholders. Traditional tools provide performance information based on historical

results (Cunha Pinto & Machado-Santos 2011:71; Balazova & Luptakova 2016:191). This raises a concern about the appropriate financial indicators that should be applied for analysing and evaluating a company. Cunha Pinto and Machado-Santos (2011:71) note that increasingly, companies have started to adopt the use of economic profit instead of accounting profit to evaluate company performance. Cunha Pinto and Machado-Santos (2011:71) describe economic profit as a new idea of management known as VBM.

Cunha Pinto & Machado-Santos (2011:71) traced the origin of VBM to the period of the industrial revolution when business operators began to consider corporate management as technically strategic in dealing with the issues of efficiency and productivity in organisations. VBM is concerned with making strategic decisions that relate to value creation, an approach of managing that induces a corporate attitude in all employees to be conscious of activities that could create wealth for the company. Therefore, the concept of VBM directs all business processes and systems towards wealth creation, which is best described as the real company earnings, in which EVA appears to be the recommended measuring tool. (Cunha Pinto & Machado-Santos 2011:71). Consequently, Maditinos *et al*. (2009:325) argue that VBM measures such as shareholder value (SHV), economic profit (EP),cash flow return on investment (CFROI) and EVA were starting to become popular from the late 1980s for incentive compensation management and for making strategic decisions.

Al Mamun and Abu Mansor (2012:310) observe that evolution in the corporate world over the last decade created the need for owners and business managers to look for a measure that could accurately show the profitability of a business entity. In addition, Al Mamun and Abu Mansor (2012:310) suggest that it is due to accounting tools currently in use being insufficient and not capable of withstanding challenges resulting from capital markets, now seen as becoming efficient. It is thus, suggested that a new value-based measurement framework, which could clearly reveal the profitability, as well as, any dismal state of businesses, be crafted (Al Mamun & Abu Mansor 2012:310). Al Mamun and Abu Mansor (2012:310) reveal a number of VBM tools that include EVA, CVA, CFROI, SVA and MVA. Al Mamun and Abu Mansor (2012:310) recommend that a company could adopt any of them as their own economic framework.

Al Mamun and Abu Mansor (2012:310) suggest that value-based measurement tools are a way to overcome the shortcomings inherent in the conventional measurement systems. Al Mamun and Abu Mansor (2012:310) further argue that VBM has been a major development that includes a company's cost of capital when calculating value creation, as a company's cost of capital inclusion in the equation would determine whether value is created. Therefore, if the company earns a return that is greater than the total costs of its capital, then there is growth in shareholder's value (Al Mamun & Abu Mansor 2012:310). It may be ideal to argue that the paradigm shift from profit maximisation to value maximisation incidentally called for an appropriate tool for measuring performance achieved by businesses. Therefore, it may be correct to suggest that VBM has really come to the rescue and particularly EVA, which, according to Stewart (2015:2), "measures all the ways to create value in any business".

Drucker (1995:7) states that if the profits earned by a company do not exceed the total costs of all capital employed in generating the profit, that it should not be described as profit at all. The statement by Drucker (1995:7) implies that if the profit presented by a company is not in excess of the costs of all capital employed in the business, then the business has not made any profit at all. Drucker (1995:7) concludes that it is only when a company has generated more profit than its cost of capital that the company is said to have made a genuine profit, if not, the business incurred losses despite paying taxes as if genuine profit has been made. Drucker (1995:7) states further that unless a company returns more profit than its cost of capital, the company consumes or destroys more resources from the economy than it creates. "Until then, it does not create wealth; it destroys it" (Drucker 1995:7).

Aulova and Frydlova (2012:3); Hamilton, Rahman & Lee (2009:268) described EVA as economic income realised only when a company has recovered an excess of both operating and financing costs. This view has been supported by Fathabadi, Fathi and Damari (2014:206); Sharma and Kumar (2012:805); Bluszcz, Kijewska and Sojda (2015:437) who argue that EVA takes into consideration both the economic profits and economic capital before concluding if there is wealth creation or wealth destruction.

Visaltanachoti, Luo and Yi (2008:21); Bolek, Kacprzyk and Wolski (2012:1) confirm that Stern Stewart & Co. developed the concept of EVA in the 1990's. Visaltanachoti *et al.* (2008:21) and Bolek *et al.* (2012:1), however, thought that concept of EVA follows the idea of residual income as put forward by Alfred Marshall in the late nineteenth century, who argued that a company should earn sufficiently to cover cost of debt and cost of equity. It has also been stated that Marshal's residual income concept is different from the ideas of EVA because of the adjustments that have to be carried out on some elements of the income statements and the capital employed when calculating EVA (Bolek *et al.* 2012:1). Bluszcz *et al*. (2015:437) also suggest that the idea now paraded and practiced as residual income (RI), economic profit (EP) or EVA had been talked about as early as the first half of the twentieth century.

Vasilescu and Popa (2011:60) observe that the prevailing high competition in the world market arena and even within company's domestic front, coupled with high volatility of interest rates and rates of foreign exchange, has prompted investors and those that manage businesses to concentrate on creating wealth. Vasilescu and Popa (2011:60) state further that the theory of finance emphasises shareholders' wealth maximisation as the utmost purpose of a company and hence, the need for a relevant approach to measuring and evaluating company operational performance. EVA is considered one of the innovative ideas that could be employed in analysing the financial data of a company and boosting its operational performance (Vasilescu & Popa 2011:60). This view is supported by Thilakerathne (2015:117) who argued that the dramatic and significant increase in the complexity and competiveness of the business environment raised the need for an effective approach that provides both financial and non-financial indicators in measuring the performance of a company.

Vasilescu and Popa (2011:60) argue that Modigliani and Miller in 1961 developed the concept of economic value, which was later taken over and expanded as EVA by Bennett Stewart and Joel Stern of Stern Stewart and Co. Vasilescu and Popa (2011:60) posit that EVA had become the current technique to evaluate the performance of management by measuring the value of shareholders' wealth and considering the costs of both equity and long-term debt. Vasilescu and Popa (2011:60) also state that the concept of EVA focuses the company's view on the efforts to generate value as well as assessing company financial performance fairly. Such

assessment of company's financial performance and value generation would be done by utilising weighted measurements such as weighted average cost of capital (WACC) from its capital structure (Henryani & Kusumastuti 2013:172).

EVA has been described as a model and a method in order to highlight the importance of its function as an established standard and systematic procedure for measuring company performance with accuracy and efficiency (Bostan, Mates, Hlaciuc, Grosu, Iancu & Socoliuc 2010:120). Bostan *et al*. (2010:121) further describe EVA as a new tool for corporate governance that could redirect management ideas and judgement oriented towards value or wealth creation.

Man and Vasile (2009:115) describe EVA as a parameter to evaluate the economic profit, managerial performance as well as assessing a company's ability to create wealth for all providers of capital. Man and Vasile (2009:115) further state that EVA could be calculated for the whole company and for its departments or divisions irrespective of the size of the company. The EVA index could be used to calculate the performance of a company for a period shorter than a year. EVA index is calculated by considering difference between economic profit and costs of all capital (Balazova & Luptakova 2016:192). This calculation is useful as it includes cost of both equity and debt in the equation to arrive at whether a company creates value or not. It may not be out of place to say that this attribute distinguishes EVA from other measures that are based on price of the company shares at year-end. Stern (2011:57) presents EVA as an amount of operating income that results in economic income after deducting costs of all capital employed.

Furthermore, Thilakerathne (2015:118) argues that the idea of EVA came from the publication "Dividend Policy Growth and the Valuation of Shares" by Miller and Modigliani (1961:416). Thilakerathne (2015:118) argues further that the concept of free cash flow and the idea of evaluating a business on a cash basis developed by Miller and Modigliani (1961:416) was incorporated into the concept of EVA by Stern Stewart & Co. In his argument, O'Byrne (1996:116) of Stern Stewart & Co., states that EVA, calculated as net operating profit after tax (NOPAT) minus WACC gives performance measurement and evaluation standard that links theory with practice.

Alam and Nizamuddin (2012:160-161) argue that EVA is not a new technique but rather another way of calculating the residual income by making some adjustments to arrive at economic profit and economic capital. Residual income has been defined as operating profit after removing capital cost. Economic profit is total net profit after tax, less interest on capital invested (Alam & Nizamuddin 2012:160-161). Furthermore, Alam and Nizamuddin (2012:160-161) suggest that the literature on residual income was first published in the theory of accounting in 1917 and in the management accounting literature in the 1960s. Alam and Nizamuddin (2012:160-161) also suggest that EVA was being talked about in the Finish press circle and among academicians in the early 1970s, while the wide-spread popularity of EVA and its adoption by several companies is due to the tool being linked to the concept of MVA.

EVA has also been stated to be a good indicator both for the retrospective (EVA for the past performance analysis) and prospective performances analysis (EVA for the future period) (Nakhaei, Abdul Hamid, Anuar & Hakimpoor 2013:53-54). Nakhaei *et al.* (2013:53-54) present EVA in the respective perceptions of stakeholders of a company as follows:

- Shareholders perceive EVA as the value created for them by the company after paying the state's taxes, employees' remuneration and the costs of all capital.
- Management see EVA as good tool for assessing financial performance, resulting from the application of a chosen business strategy. Management also see EVA as a good metric to use for business strategy selection and investment decisions by comparing results obtained from current and past periods.
- Potential investors regard EVA as a tool useful to measure the price to offer for their target investments including the expected performance of the company based on past EVA performance reports.
- Credit providers perceive EVA as a tool that could provide information about the capability of the company to meet their credit obligations as and when due together with the accruing interests.

Pantea, Munteanu, Gligor and Sopoian (2008:92-93) also suggest that EVA offers both retrospective and prospective analysis of an entity. On the retrospective analysis

Pantea *et al.* (2008:92-93) state that EVA is a function of a number of economic as well as financial barometers, which include:

- The amount of profit reporting that depends on how efficient the operating activities are. This is because the greater the degree of operating efficiency, the higher the EVA could be;
- The method of depreciation and amortisation chosen by the company including policy on provision;
- The efficiency of working capital management by the company;
- The capital mix of the company regarding the size of its equity to debt ratio. That is choosing the optimal mix that minimises WACC because the lower the WACC the higher the probability of achieving a higher EVA;
- The amount of taxation charge on the profits of the company as EVA is the amount that is left after taxes have been settled;
- Other numerous intangible factors (key success indicators) impacting performance of the business. These include company skills, employee competencies, reputation of company and its products as well as its capacity to adapt to changes regarding technology and processes.

However, concerning prospective EVA analysis, the investor considers EVA as wealth generated by the company, which is computed as the amount that is left after cost of capital has been settled (Pantea *et al*. 2008:93). Pantea *et al.* (2008:93) conclude that managers could be assessed based on the results obtained after implementing a particular business strategy that has created value for the company, which is measured in terms of MVA.

According to Pantea *et al*. (2008:92), MVA is the difference between the market value of the invested capital and the book value. Therefore, the decision rule when applying MVA for investment decision purposes is:

- Accept the strategy if MVA ≥ 0;
- Reject the strategy if MVA < 0;
- However, for mutually exclusive projects, the decision rule is to accept the one that has a higher MVA (Pantea *et al.* 2008:93).

Alam and Nizamuddin (2012:163) describe the following types of EVA:

- Basic EVA. This is EVA calculated based on accounting profits prepared according to the generally accepted accounting principles (GAAP), without applying the adjustments recommended by the developers of EVA metric;
- Disclosed EVA. This is the EVA prepared after implementing some of the adjustments recommended by Stern Stewart & Co. on the financial statements of the company;
- True EVA. True EVA is computed when all necessary adjustments have been made to the financial statements;
- Tailored EVA. Specifically each company designs this EVA methodology when all peculiarities relating to the company are considered. These include the structure of the company, the product mix, types of strategy as well as the accounting policies.

Alam and Nizamuddin (2012:163) suggest that a company should adopt the type of EVA that suits its operations and minimises the cost of implementation. Alam and Nizamuddin (2012:163) further suggest that if a method is adopted that, the company should stick to it and regard it as the rule that governs its performance appraisal decisions for the company.

From the literature reviewed, it is perceived that EVA might be a standard tool suitable to measure company performance in the 21st century. It may also be deduced from the literature that EVA could be applied in managers and employees compensation schemes. Moreover, the literature reveals that VBM and EVA techniques enhance, as well as, evaluate shareholders' investment assets. Consequently, valuation of assets is discussed further in the succeeding section.

2.4 VALUATION OF ASSETS

The following parameters define the value of an asset:

- The cash flow it generates;
- The asset life span;
- The growth expected of the cash flow over its life span;
- The level of risk inherent in the cash flow (Burksaitiene 2009:710).

Juhasz (2011:52-53) suggests internal rate of return (IRR) and net present value (NPV) for evaluation of any investment. In the same vein. Burksaitiene (2009:710) states that the value of an asset is the NPV of the future cash flow expected from the investment. This statement is in line with the theory of economic value which, Ongeri (2014:185) states as “the sum of the discounted value of all future cash flows”, which the owner expects to receive as a result of possessing and making decisions regarding the use of the assets. Burksaitiene (2009:710) describes a company as a “collection of assets” and states that the value would not just be measured in terms of the cash flow already being realised from the invested capital, but also the estimate of the cash flow expected from future growth.

The above assertion makes it imperative to suggest that investors should evaluate the appropriateness of the tools used by the company to value any asset and for analysing the financial performance of the company as it may invariably indicate the validity and reliability of the results shown in the financial statements. The exercise would go a long way to reveal if the company management has ‘window-dressed’ the accounts by circumventing International Financial Reporting Standards (IFRS) guidelines in order to deceive the investors. Bhasin (2013:29) and Dibra (2016:283) present examples of such accounting fraud cases as Parmalat, Enron, Tyco, WorldCom and Satyam Computers Limited

The tool used by a company to evaluate its performance would enhance investor confidence in its result for investment decision purposes. It has been asserted that the following factors influence an individual’s investment decisions (Dash 2010:25; Kadariya 2012:29; Jagongo & Mutswenje 2014:100):

- Capital gain: The profit to make by selling an asset such as company shares;
- Company capital structure: This is how company finances its overall operations by the use of different sources of funds in form of debt and equity;
- Risk preferences: Risk preference refers to the attitude investors hold towards risks when making investment decisions;
- Company’s position within the industry: Positioning refers to an overall strategy with the aim of making a brand occupy a distinct position, relative to competing brands, in the mind of the customer;

- Financial performance: Financial performance refers to the degree to which financial objectives of a company has been achieved;
- Investment returns: This is *a performance measure of an* investment;
- Economic condition: Refers to the current state of the economy of a country. An economy is considered sound when it is expanding or adverse when contracting;
- Goodwill of the company: This refers to the value of a company's brand name, customer base, customer relations, employee relations, patents and technology;
- Environmental factors: These represent the identifiable element in the physical, demographic, cultural, economic, regulatory, or technological environment that affect the survival, operations, and growth of an organization;
- Accounting information: Accounting information is data about transactions of a company ranging from acquiring inventory, equipment and properties as well any other events relating to the business operations.

However, Shah and Haldar (2015:47) state that, investors in their decisions while investing in a company should also consider the choice of performance measure. Shah and Haldar (2015:47) note that investors in the Indian capital market base their investment decisions mainly on the accounting results of companies. The above observation could be applicable to South Africa as well. Van der Poll *et al.* (2011:124) and Weldon (2013:8) suggest that many South African companies (including the JSE listed industrial companies) are still using the traditional tools to measure company performance. Considering the perceived shortcomings in earnings-based measures, it would be appropriate to suggest that investors should apply the value-based measures when determining the viability of their target investments (Paragh (2012:7); Panigrahi *et al.* (2014:288). The application of this alternative value-based approach to value measurement would give more information regarding company performance.

Reddy (2013:179) states that companies have been adopting both modern and traditional accounting metrics to measure their financial performance. Reddy (2013:179) found that conventional techniques of EPS, ROA and ROE, together with their effect on shareholder or market value, have been discussed by several researchers and investors over a long period. Fathabadi *et al*. (2014:205) mention that the traditional measures, which include revenues, ROE and cash flow, focus only on

accounting profit. Moreover, Reddy (2013:179) claims that it is apparent that managers could manipulate accounting earnings to present their firms as performing well. Fathabadi *et al*. (2014:205) assert that accounting measures ignore the cost of all company capital sources, while EVA considers all capital sources in measuring performance.

Bluszcz *et al.* (2015:437) argue that EVA integrates growth and profitability objectives into a single measurement tool. Ongeri (2014:184) also supports the view by Bluszcz *et al.* (2015:437), describing EVA as the true economic value computed having adjusted the financial statements that are prepared in line with the GAAP conventions, in addition to removing the cost of equity. Ongeri (2014:184) define economic value as the value of any asset, which relates to future cash flows that could be gained from the asset, and accounting value, on the other hand, as the book value of equity as presented in the company's statement of financial position.

The views expressed by Reddy (2013:179); Fathabadi *et al*. (2014:205); Bluszcz *et al.* (2015:437) and Ongeri (2014:184) reveal that companies should consider moving from conventional accounting metrics to VBM tools in order to forestall the massive kind of company collapse witnessed in the era of WorldCom and Enron. Such prevention could be achieved by implementing some of the suggested adjustments to the accounting profits and capital employed in order to convert them to economic profit and economic capital respectively. Conversion of accounting profits and capital employed to economic profits and economic capital respectively, could eliminate possible effects of accounts manipulations such as how Enron and WorldCom covered losses and deceived investors into believing that the companies were performing well financially.

Khaddafi and Heikal (2014:220), in comparing EVA with the traditional measuring instrument of ROE and ROA, state that it is difficult to ascertain whether a company has created value or not because unlike EVA the metric does not include cost of debt and equity in the calculation. Khaddafi and Heikal (2014:220), therefore, suggest that EVA could be used independently and that the use of EVA encourages the allocation of low costing funds for investment in companies. Al Mamun and Abu Mansor (2011:315) observe that companies that adopted EVA reported significant financial

improvements. Consequently, it may be advantageous for companies who have not adopted EVA to undertake studies to determine EVA suitability for their own type of business in order that they may be surer of creating value for their owners.

2.5 EVA, STAKEHOLDER-BASED MANAGEMENT AND VALUE CREATION

Harrison and Wicks (2013:102) identify company stakeholders as capital providers, the technology, material resources, employees, customers, the community and other legitimate institutions and organisations. Harrison and Wicks (2013:98) further state the importance of a stakeholder-based management as the focus of managers on activities that lead to higher performance. The above authors, moreover, demonstrate that the existing empirical literature highlights a link between stakeholder-oriented management and company performance usually measured in financial terms.

According to Argandona (2011:8), there are six types of values relevant to company stakeholders. These types of values are:

- Economic extrinsic value or economic value;
- Intangible extrinsic values such as training and recognition;
- Psychological intrinsic value such as job satisfaction;
- Intrinsic value in the form of knowledge acquisition;
- Transcendent value consisting of evaluative learning;
- Value that contains positive or negative externalities.

However, this study focuses only on EVA and company characteristics that influence EVA outcomes. This is because it is a metric that is considered as the VBM tool that rests on creating economic value for all company stakeholders, particularly the owners (Berber, Pasula, & Radosevic 2012:85; Stewart 2015:2). Furthermore, if a company is viewed as an economic unit that produces and also possesses value, then its value could be defined as the total value of the company's stock and accounting figures (Ongeri 2014:185). Geetha and Swaaminathan (2015:108) observe that a company's book value (BV), EPS and earnings ratio (ER) significantly influence the market price of the shares, which, by extension, is the company's perceived value. Sharif, Purohit and Pillai (2015:214) who argue that ROE, BVS (), DPS (dividend per share) and PE (price/earnings ratio) have a significant positive relationship with the market price of

shares support this view. However, Haque and Faruquee (2013:41) found no significant correlation between share price and the variables of BV, EPS, SP, DPS and ROE. Furthermore, Oyedokun, Remi and Taiwo (2011:108) demonstrate that stock price might be influenced by a company's innovations, human capital and supply chain management.

Regarding this study, however, it is viewed that if a man's personality, as a natural person, is defined by his entire behaviour and outlook, so should a company, a legal person, be measured by its characteristics and qualities. This may include EPS, ER, ROE, DPS, BV and other elusive factors of innovations, human capital as well as supply chain management as suggested by Oyedokun *et al.* (2011:108). Alam and Nizamuddin (2012:160) posit that profit maximisation is an age-old concept. This practice has matured from wealth maximisation to value maximisation (Alam & Nizamuddin 2012:160). This view is supported by Bhasin (2013:185) and Panahi, Preece, Zakaria and Rogers (2014:291) who state the universal acceptance of the goal of corporate finance as maximising the wealth of company owners.

Vasile (2016:512) also states that the purpose for companies to engage in any business operation is primarily to satisfy the interests of all stakeholders. Vasile (2016:512) explains further that shareholders are interested in recovering their investments at a profit; while staff and management are motivated to create value for shareholders by the salaries and bonuses, they receive (Vasile 2016:512). Ultimately, value creation supports the entire economy by raising the standard of living of the populace (Vasile 2016:512). Vasile (2016:5013) argues further that the need to increase company productivity and profitability are to create value for shareholders for the risk of investing in the company and also to satisfy managers' and employees' immediate interest of job security and wage payment, which often include some additional benefits from company profits. Vasile (2016:512) further observes that growing profitability and productivity of companies invariably contributes to growing the gross domestic product (GDP) of the nation that might lead to increased social welfare. Cachanosky (2009:14) who suggests that EVA measurement should replace the conventional GDP tool in measuring economic growth, agrees with the view of Vasile (2016:512). Cachanosky (2009:14) states that the correlation of EVA measurement with economic growth is more direct than with conventional GDP. If

measured well, there would be no more reports of economic growth when, an individual increases his consumption by merely depleting his assets (Cachanosky 2009:14).

It has been revealed by Ganea (2014:20) that value creation and maximising shareholders' wealth are the pivots that provide the basis for the formulation of business strategy. Ganea (2014:20) further asserts that value created is not to be limited to measuring and evaluating but also to identifying factors of value creation described as the classic aspects of a company such as operating, investing and financing activities. The view expressed by Ganea (2014:20) highlights the importance of identifying company characteristics that impact on EVA, which is the focus of this study. Burksaitiene (2009:709) reveals that the theory of finance provides that the primary role of the manager is making decisions that could lead to maximising the value of a company. This would translate to the creation of shareholders' wealth, which may be achieved by allocating available company resources efficiently (Burksaitiene 2009:709). Burksaitiene (2009:710) has itemised the pattern of value creation as follows:

- Divesting from low-performing investments and improving on the cash flow from profit-making assets;
- Designing an efficient business operating mechanism in order to reduce operating costs and even cutting on the fiscal liabilities;
- Cutting maintenance expenditure on existing assets and embarking on efficient working capital management;
- Increase earnings through reinvestment, optimum pricing decisions and by making strategic acquisitions;
- Lengthening the period of high growth through the benefits of competitive advantage such as brand reputation, cost advantage and legal protection of patents and licenses, amongst others;
- Reducing the cost of capital by arranging an optimal capital structure.

Value drivers or factors of value creation have been described as operational practices that improve value creation results (Vislwanath 2010:36). Examples of these value drivers are profitable growth, strategic acquisition, operating efficiencies through cost

reductions and assets utilisation in the form of reducing inventory levels (Vislwanath 2010:36). The views stated above suggest that a company has a number of stakeholders aside from the providers of capital (shareholders). Moreover, in order for the company to retain its capital, which is vital for its survival, company management needs to create wealth or value for these capital providers. Moreover, the concept of value drivers postulated by Vislwanath (2010:36) reinforces the relevance of this study, which focuses on identifying company characteristics that impact on, or drives EVA.

2.6 EVA INCENTIVE MANAGEMENT

Hamilton *et al*. (2009:268) affirm that EVA could be used to link incentives with the operating results of the company. The above authors further assert that EVA shows the level of economic profit because of decisions made by managers. Such managerial decisions include efficient operational activities, divesting from loss-making projects and investing only in assets whose earnings surpass capital cost. Hamilton *et al*. (2009:268) claim also, that EVA metric shows the results of managerial decisions and actions, and therefore, to be applied when developing a compensation system that reflects the volume of wealth created for the owners.

Panigrahi *et al*. (2014:140) stating that EVA and MVA had proven to be good measure of performance that could be used to motivate managers towards increased performance confirm the assertion that EVA measurement allows tracking managerial decisions. It may be correct to reason, therefore, that aligning the interest of managers to that of shareholders could reduce agency costs and improve on performance of the company. Hamilton *et al*. (2009:268) said that companies adopted EVA measures in the 1990s as a better tool to align managerial performance with incentive schemes in order to improve performance of companies. Hamilton *et al*. (2009:268) also assert that when EVA is linked to the performance management system, there is a reduction in accounting distortions.

Ray (2012:264) states that using EVA to design a system of compensating managers could impact favourably towards accomplishing goal congruence, which leads to reducing agency cost. Ray (2012:264) further suggest that achieving goal congruence

and minimising agency cost is possible because EVA improves internal corporate governance by motivating managers to carry on with activities that could enhance growth in shareholders' value and discontinue any activity that destroys value. Paragh (2012:18) and Ray (2012:264.) opine that EVA incentive system could lead to improvement in operating efficiency and increasing turnover, stimulating managers for self-control and encouraging self-assessments by employees, and therefore, ensure the enhancement of EVA for the company

Ray (2012:266) states further that EVA is consistent with effective economic principle, which declares that a company creates value only when it generates surplus returns that exceed cost of capital. Paragh (2012:20) and Ray (2012:266) linked the economic principle of surplus generation over the cost of capital to how a company compensates managers relative to their ability to utilise company resources to achieve profitability. The EVA approach is suggested to be another method of evaluating the effectiveness of incentive systems (Ray 2012:266). This is because EVA compares results with the cost of capital employed in achieving those results. Comparing operating results with the capital input forms the foundation for measuring efficiency, which could serve as a motivation for managers to increase their prudence in managing company finances (Paragh (2012:20); Ray (2012:266). Berber, Pasula and Radosevic (2012:85) also declare that EVA is the contemporary technique for performance measurement that allows for appropriate compensations and, therefore, encourages managers to make decisions that would result in creating value for shareholders.

Vislwanath (2010:40) suggests that EVA is the metric that a company could use to link with performance compensation systems, while other conventional methods of stock returns, NPV or cash flow are not suitable for building a compensation system. Paragh (2012:13) states that linking EVA with incentive programs could lead managers to engage in any one of three activities that would invariability bring about value creation for the company. Paragh (2012:13) lists the activities as:

- Using currently available resources to earn improved returns, which increases EVA by earning higher returns without increasing the cost of capital employed;
- More productive and efficient utilisation of less capital to earn a target return;
- Committing an amount of capital to produce a target profit through a reduction in the cost of capital.

Dinu and Ciora (2012:284) conclude that achieving higher operating results as well as value creation could be possible by linking EVA with managers' incentive schemes. The importance of achieving goal congruence is to eliminate the effects of agency conflict, which could be achieved by implementing an incentive scheme that is aligned to value creation using EVA metric (Dinu & Ciora 2012:284).

Berber *et al.* (2012:85) found that managerial compensation is a complex area of human resource management. Therefore, since incentives are the most important part of executive compensation, value should be assigned to managerial performance, which should strongly depend on actual performance results. Berber, *et al.* (2012:85) further observes that while values of shares were declining, managers were still enjoying bonuses and other incentives. The above authors attribute their observation to the lack of sufficient information resulting in weaker control of the managers by shareholders, therefore, leading to agency problems. Berber, *et al.* (2012:85) state that because of the existence of all these issues, the need arises for developing a good compensation system using a tool such as the EVA metric, since it is a concept that is understood as the contemporary technique for performance measurement. Berber, *et al.* (2012:85) state further that EVA motivates managers to embark on decisions that are consistent with the creation of value for shareholders.

Berber, *et al.* (2012:85) describe EVA incentive scheme as a system that does not only calculate compensation based on achieving the budgeted EVA, but also on the marginal EVA, or the difference between achieved EVA and budgeted EVA. Therefore, the EVA margin that is above the budgeted is used to create a bonus bank where managers are compensated in future with regard to the accumulated EVA achievement recorded in the bonus bank. The bonus bank scheme would further motivate managers to make decisions continuously that would result in value creation for shareholders as they would always be compensated (Berber *et al*. 2012:85).

2.7 EVA AND COMPANY CHARACTERISTICS

Without prejudice to the legal definition of company characteristics (Money Matters 2019; Owlgen 2019), in this study and for the purpose of the analysis, company characteristics would be defined as the attributes, qualities, possessions, relationships

and operational activities that differentiate one company from another within an industry, including the characteristics that companies share in common. Ganea (2014:20) and Vislwanath (2010:36) who suggest that identifying a good wealth-measuring tool should include determining factors that impact on creating wealth inform linking EVA to company characteristic in this study. The company characteristics discussed for the purpose of this study therefore are limited to market segments, capital size, capital gearing, product types and sub-sector.

Porter (1979:214) describes industry as a composition of clusters, or groups of companies. Porter (1979:214) observes that companies in an industry differ from one another in a number of ways. The companies listed in the industrial sector of the JSE apparently differ in terms of products, sub-sector, market, capital size and gearing. It is the opinion of Porter (1979:215) that the attributes peculiar to a company could impact on the company's profitability. Based on the observation of Porter (1979:215), it may be appropriate to insinuate that industrial companies' attributes defined in this study as company characteristics could impact on EVA.

2.7.1 Company capital gearing

The gearing of a company is described as the relationship between debt and the equity components in the company's capital structure commonly calculated in form of percentage (Investopedia 2017b). Gearing reveals how the operation of a company is financed by lenders of capital in relation to that of equity shareholders (Investopedia 2017b). The common description of gearing is the debt-to-equity ratio and it indicates the risk level of a company in the perception of debt capital providers or investors. Measuring the appropriateness of the gearing ratio of a company depends on the sector to which the company belongs and in comparison with those of its competitors (Investopedia 2017b).

Bolek *et al*. (2012:3), De Wet and Hall (2004:56) and Tunji, Adebayo and Tolulope (2015:77) argue that the gearing of a company impacts on the company's earnings. The assertion of impact of gearing on EVA could be hinged on the understanding that gearing indicates the level of risk associated with a company as a highly geared company might be vulnerable to downturn in the economy (Investopedia 2017b). The

reason for the vulnerability during a time of economic recession is that the company would still be required to meet its debt obligations despite the fall in cash flow due to the fall in economic activities resulting in a decrease in cash flow of the company. In addition, considering the financial principle of risk-return, which emphasises that the higher the risk inherent in an investment, the higher the return that would be required by investors, it could be argued that gearing would likely impact on EVA as the higher return (interest charge) would be settled with cash flow, which would cause a reduction in EVA. Similarly, Shubita and Alsawalhah (2012:109) found a negative relationship between volume of debt in a company's capital structure and the profitability of the company. Shubita and Alsawalhah (2012:109) implied that an increase in debt would result in a decrease in the level of the profits of the company.

2.7.2 Company sub-sector

Company sub-sector refers to segments of the economy where companies share products and services (Investopedia 2017a). Sub-sector could be described as the breakdown of a sector into smaller sectors (InvestorWords 2017b). The purpose of dividing the economy into sectors and sub-sectors is to assist in the analysis of the entire economy. Investors, moreover, consider the sectors and sub-sectors that perform well in terms of returns when making investment decisions (Investopedia 2017a).

Considering that investors would have to look at sectors and sub-sectors that return more than others in making investment decisions suggests that a company's sector or sub-sector could have a bearing on its profitability and hence, EVA. Olweny and Shipho (2011:1) and Kearney (2012:2) suggest that the factors peculiar to sub-sectors to which a company belongs impact on profitability. The sectoral-specific factors include capital adequacy, asset quality, liquidity, operational efficiency and income diversification (Olweny and Shipho 2011:1). Similarly, the difference in return on investments of companies in different sectors and sub-sectors could be ascribed to the seasonality of products of companies or the level of success of projects undertaken by companies that operate in a particular sector (Investopedia 2017a).

2.7.3 Company industrial and household consumer product types

Strategic decisions on marketing usually relate to the concept referred to as marketing mix (Businessfundas 2017). Marketing mix refers to the four basic marketing categories of product, price, place and promotion (Businessfundas 2017). Products could be tangible like household items, or intangible, such as services. Products could be valued based on the features, quality, size, design and even brand. It is the opinion of the researcher that product, being a factor in the marketing mix, could also impact on EVA. Hussein and Gholam (2013:95), Jahanshahi, Gashti, Mirdamadi, Nawaser and Khaksar (2011:253) and PBM partners (2008:1) suggest a relationship between company products and profitability.

2.7.4 Company local and international distribution market segments

Market could be described as geographical location or nominal environment such as the Internet, where buyers and sellers of goods and services come into contact (Businessdictionary 2017). For this study, market is regarded as domestic or international, based on whether companies sell their products locally or internationally, or both. Aulakh, Kotabe and Teegen (2000:358) suggest that companies could use export to create competitive advantage. It is the view in this study that exporting as a means of having a competitive advantage might impact on the company's EVA.

The view that exporting could impact on EVA is supported by ITA (2017) by stating that export strategy could be profitable to companies of different sizes. The assertions of Aulakh *et al.* (200:358) that companies could use export to create competitive advantage and supported by ITA (2017), suggests that company characteristics of market could impact on profitability and hence, EVA.

2.7.5 Company operating capital size

Capital size, as used in this study, refers to the volume or amount of capital available to each of the industrial companies that are the focus of this study. The study asserts that the size of a company is a function of its capital size. It is the opinion of the researcher that a company's capital size could impact on EVA performance of the company. Gaur and Kesavan (2007:22) who suggested that there is a higher inventory

turnover in large companies than in smaller companies due to economies of scale back the assertion. It might be correct to think that a higher inventory turnover could result in a higher profit performance and hence EVA, all things being equal. Furthermore, Wainaina (2008:28) and Asimakopoulos, Samitas and Padadonas. (2009:930) suggest that there is a relationship between profit and the size of a company's capital measured in terms of value of the assets employed in the company operations.

2.8 EVA, EXCHANGE RATE AND INFLATION

Merriam-Webster (2017) and InvestorWords (2017a) define exchange rate as the rate at which the currency of one country could exchange or be converted into the currency of another country. In other words, the value of one currency relative to another currency. Inflation, on the other hand, is defined as a persistent, substantial rise in the general level of prices related to an increase in the volume of money and resulting in the loss of value of currency (Dictionary.com. 2017). Inflation relates to interest rate and interest rate influences exchange rate (Investopedia 2017f). As a country may try to balance interest rates and inflation, a low interest rate could spur consumer spending and, consequently, economic growth and generally positive influence on currency value (Investopedia 2017f). However, if consumer spending increases to the point where demand exceeds supply, inflation may result (Investopedia 2017f).

Imimole and Enoma (2011:1) found exchange rate depreciation as one of the main determinants of inflation in Nigeria and that exchange rate depreciation has a positive and significant effect on inflation. The implication of this finding is that exchange rate depreciation could result in an increased rate of inflation (Imimole and Enoma 2011:1). In the same vein, Sek, Ooi and Ismail (2012:1580) observe that there is a significant correlation between exchange rate movements and inflation in Asia. It may not be out of place, therefore, to argue that the findings of Imimole and Enoma (2011:1) and Sek, Ooi and Ismail (2012:1580) regarding exchange rate relationship with inflation could apply to South Africa.

It is argued that inflation affects value creation by reducing the value of wealth created for shareholders when adjusted for inflation. Pimco (2017:2) argues that value of

wealth created must keep up with the rate of inflation, otherwise, when adjusted for inflation, could result in a negative return. The observation by Pimco (2017:2) suggest that EVA positive could become EVA negative when adjusted for inflation. Winarno (2013:9) and Paul, Tang and Bhatt (2014:20) argue that if inflation exceeds a certain level, it could negatively affect wealth creation by causing a lower growth rate.

It may be correct to conclude that since there is a relationship between exchange rate and inflation and since inflation is found to impact on wealth creation, therefore, exchange rate could also impact on companies' wealth creation indirectly.

2.9 VALUE-BASED MANAGEMENT AND TRADITIONAL MEASURES

It has been suggested that any technique used in measuring the value of a company without bias towards any class of the stakeholders may be considered a good performance measurement tool (Kaur & Narang 2008:48). Kaur and Narang (2008:48) observe that investors and most companies rely on measures that emphasise the size of income such as share price, earnings, growth in earnings (GIE), EPS, ROE and ROCE. These metrics do not take into consideration all the capital employed and these metrics could be improved upon by simply investing more capital (Kaur & Narang 2008:48). Fathabadi et al. (2014:205) and Panigrahi et al. (2014:280) have supported the above assertions. The result is that traditional measures like EPS, DPS, ROE and ROA used by shareholders to measure performance of companies are criticised for not including the cost of all capital employed by the company in calculating value created.

Value-based management approaches are different from the traditional performance measurement techniques (Al Mamun & Abu Mansor 2012:310; Reddy, Rajesh & Reddy 2011:23; Panigrahi *et al*., 2014:288; Tian, Zhang & Rensel 2014:25; Mosavai 2015:79). VBM techniques have been considered appropriate in overcoming one basic shortcoming inherent in traditional measurement systems, which is, not accounting for all the cost of capital before stating if value is created or not (Reddy *et al.* 2011:23; Al Mamun & Abu Mansor 2012:310; Panigrahi *et al.* 2014:288; Tian *et al*. 2014:25; Mosavai 2015:79). However, there are other empirical results that do not support the assertion that EVA is superior to the conventional accounting tools in measuring value

creation (Bhasin 2013:196; Laing & Dunbar 2015:46). Khaddafi and Heikal (2014:219) state that a company that shows good performance with the use of financial ratios may not show the same results when assessed with EVA metric. Khaddafi and Heikal (2014:219) further suggest that this is because calculating the created value of a company using EVA approach considers all the elements of capital (equity and debt), which invariably means a consideration of the risk level of the company. The assertions of Khaddafi and Heikal (2014:219) have been upheld by Maditinos *et al.* (2009:326) and Issham (2013:1758) who imply that performance measures prepared using the traditional method are no longer adequate in providing shareholders with the required information necessary to assess the value of their investment.

Issham (2013:1758) argues that EPS could be raised by investing more debt capital to achieve more earnings. Issham (2013:1758) states further that EPS would rise if return on the additional debt capital were greater than the cost. More so, Soral and Bhanawat (2009:53) posit that the traditional measures such as ROCE, return on net worth (RONW), EPS, to mention but a few, do not reveal shareholders' true return as they consider only the borrowing costs without reference to the cost of equity. Issham (2013:1758) argues further that the traditional tools, which worked well in the era of industrial revolution, are not consistent with the skills and competencies relating to technological advancement employed by modern companies. Issham (2013:1758) further states that the business paradigm as to how businesses operate has changed – "now, businesses rely on relationships among customers, suppliers and employees".

Issham (2013:1758) observes further that:

- The conventional measures give information regarding the past and do not show what might happen in future;
- Traditional techniques mainly provide information for regulatory purposes rather than supplying management with information for decision making:
- Traditional tools do not measure the potential of an asset to generate returns in future but only measure past performance;
- Under traditional measuring systems, managers could trade-off the interests of the stakeholders by manipulating profits through staff or investment reductions. The

outcome of such a decision would be exchanging the long-term growth for short-term profit;

- The conventional metrics could be subject to the opinion of the accountant and therefore, the accountant could manipulate the operating results of the company.

Table 2.1 contains the various tools within the traditional accounting and economic (VBM) performance measurement philosophies that might fit into a company's strategic goals.

Table 2.1 Tools for accounting and economic measures

Accounting tools	Economic tools
The accounting model expresses the value of a company using: • Earnings per share (EPS) • Rate of profit growth (ROPG) • Return on equity (ROE) • Return on assets (ROA) • Dividend per share (DPS) • Book value (BV) • Operational cash flow (OCF) • Return on sales (ROS) • Shares of supply and demand (market share)	Value of a company under economic tools are expressed using: • Power of asset profitability • Potential investors • Difference between rate of return and weighted average cost of capital (WACC). These involve: • Economic value added (EVA) • Refined economic value added (REVA) • Market value added (MVA) • Cash value added (CVA) • Free cash flow (FCF)

(Nakhaei *et al.* 2013:49-50)

Nakhaei *et al.* (2013:49-50) state that the performance of a firm might be measured using different approaches. Nakhaei *et al*. (2013:49-50) suggest that the criteria for evaluating a company and managers' performance could be by two different bases of accounting and economic measures, as presented in Table 2.1.

Reddy (2013:179) lists tools of analysis used in performance measurement as EPS, EVA, MVA, ROA, ROCE (return on capital employed), StMR (stock market returns) and RONW. Among the listed tools are traditional tools, except EVA and MVA. Moreover, like Nakhaei *et al*. (2013:49), Alam and Nizamuddin (2012:162-163) present a list of other VBM tools as seen in Table 2.2 showing name of the tool, the developer

and the formula used in the calculations. Each of these tools could be applied by companies in order to achieve strategic goals of wealth maximization.

Table 2.2 Value-based management tools

Name	Developer	Formula
Cash flow return on investment (CFROI)	Boston Consulting Group (BCG) and HOLT Value Associates	CFROI (gross cash flow/ gross assets), is calculated in two steps. First, inflation-adjusted cash flows are compared with the inflation-adjusted gross investment. Then, the ratio of gross cash flow to gross investment is translated into an internal rate of return by recognizing the finite economic life of depreciating assets and the residual value of non-depreciating assets such as land and working capital.
Cash value added (CVA)	Academicians	CVA = Operating Cash Flow (OCF) - Operating Cash Flow Demand (OCFD). OCF is the sum of Earnings before Depreciation, Interest and Tax (EBDIT, adjusted for non-cash charges), working capital movement and non-strategic investments. OCFD represents the average capital costs per year (in absolute terms) that is constant over the investment period.
Shareholder value added (SVA)	Alfred Rappaport and & LEK/Alcar Consulting Group	Estimated future cash flows are discounted to present value to calculate the value of the firm continuously. Measuring the current performance is based on comparing these cash flow estimates and period's real cash flow.
Adjusted economic value added (AEVA)	Academicians	It is unlike EVA in the sense that it uses current value of assets instead of book values.
Refined economic value added (REVA)	Academicians	It uses the market value of the firm in the beginning of the period instead of book value

Source: Alam and Nizamuddin (2012:163)

Traditional approaches to measure performance are mostly based on the company's primary goal, which is considered profit maximisation. The modern approach of value-based management is seen as the connection of all the company's activities together with people who are involved in the business process, using a single criterion that results in the increased value of the invested capitals of company owners (Issham 2013:1757; Bluszcz & Sojda 2015:437; Misankova 2016:1). Reddy (2013:179) states that criticisms against the shortcomings of the traditional measures led several researchers to suggest new performance measures such as presented in Table 2.2.

Al Mamun and Abu Mansor (2012:312) observe that EVA was made popular in countries like Canada, the United Kingdom, Poland, Brazil, Mexico and Germany because of the number of companies in the United States of America that had adopted its use for measuring company performance. Al Mamun and Abu Mansor (2012:312) reveal that countries like New Zealand and China had even adopted EVA for performance measurement of their state-owned companies.

This study focuses on determining company characteristics that impact on wealth creation using EVA as a performance-measuring tool. The reason for using EVA as a measure of wealth (in addition to the ones earlier advanced) is the assertion by Stewart (2015:2) that EVA is directly tied to shareholder value and shareholder returns and that EVA is "the best measure of corporate performance" due to its direct link to value. This implies that achieving a positive EVA is achieving the primary purpose of investing in any business, which is value creation for shareholders.

The application of EVA for wealth evaluation in this study is further reinforced by the fact that many companies that are highly regarded changed from applying traditional performance measurement tools to using EVA in their strategic management decisions. Bhasin (2013:187) and Al Mamun and Abu Mansor (2012:312) identify the companies that have adopted the use of EVA in place of the traditional tools to include Eli Lilly, Toys R Us, CSX, Quaker Oats, DuPont, Coca-Cola, AT&T, Briggs & Stratton, as well as Sprint Corporation. Bhasin (2013:187) and Al Mamun and Abu Mansor (2012:312) state that the companies mentioned employ EVA in making decisions such as investment decisions, capital budgeting, business combinations and also to evaluate the performance of managers and divisions.

2.10 EVA ADVANTAGES AND SHORTCOMINGS

2.10.1 Advantages

Vasilescu and Popa (2011:62), Al Mamun and Abu Mansor (2012:312) and Daraban (2017:170) discuss advantages of the use of EVA as:

- The EVA metric is designed such that value maximising is made the main objective. There are other modified EVA called adjusted economic value-added (AEVA) and refined economic value-added (REVA). However, among these three

versions, EVA is the one that is mostly used. AEVA is computed using the market value of assets, while REVA is computed using book value of assets;

- Adjusting components of the financial statements when calculating EVA eliminates distortions caused by the application of accounting principles and policies so that results would represent the actual performance level;
- Using traditional methods to assess company performance might present a company as making profits compared to if the same company is evaluated using EVA. The difference in the results between the traditional methods and EVA is due to the consideration of costs of all capital if measuring using EVA whereas traditional approaches do not account for costs of all capital employed;
- The use of EVA valuation exposes managers to their responsibility that managers would have to generate the costs to pay for using any amount of capital;
- EVA shows the actual profit generated in each period as it takes into account the cost of equity, therefore, measuring the actual profit performance of the company;
- EVA metric incorporates company business processes and procedures together with policies that govern all company operations;
- EVA is a tool which deals with various areas of decision making such as purchases management, allocation of capital and strategic planning;
- EVA is not easily influenced by manipulating financial statements, unlike the accounting-based measures;
- It is easy for directors of companies and investors to use EVA for project evaluation and investment decisions because it contains clear information that could be measured;
- EVA is a tool that could be used to value shares, therefore, investors could use it to decide which company shares to purchase;
- EVA could be used to design an incentive system so that all employees and managers would focus on maximising company value;
- EVA enables managers to combine the two basic principles of wealth maximisation and future profit growth which is an indication of the market value of shares of the company;
- EVA technique is useable by any type of company because EVA increase indicates growth of wealth of shareholders;

- The benefit of using EVA is that it is simple to explain to non-financial managers that it is the difference between net operating profit after tax and cost of capital employed by company or a division. Because it considers cost of capital, managers would be conscious of the use of company capital.

Bolek *et al.* (2012:3) suggest that EVA could be increased by implementing the following strategies:

- Changing the ratio of debt to equity within the capital structure of the company;
- Increasing the volume of sales;
- Reduction of operating costs, among others.

Bolek *et al*. (2012:3) maintain that every employee could take decisions that would contribute to the improvement of EVA, since there are various activities that could lead to EVA increase.

Al Mamun and Abu Mansor (2012:311) suggest that managers might not have to prepare different financial reporting calculations since EVA could reveal all of the information required. Al Mamun and Abu Mansor (2012:311) state that EVA could show at a glance information regarding the capital market, capital budgeting and net assets. This is because EVA calculations provide results in either positive or negative numbers, indicating if value has been created or not. According to Cachanosky (2009:15), EVA could be used to stimulate and measure economic growth of a nation. The use of EVA to stimulate and measure economic growth of a nation, according to Cachanosky (2009:15), is possible as EVA could be used to reassign and direct the nation's resources to areas where they are mostly required and that could be more productive in the bid to create wealth. It may be appropriate to argue that as resources are directed to most productive areas in order to create value, that the cumulative value created in those areas within the economic system will promote growth.

Tabara (2010:101) posits that EVA results in the creation of wealth in cash and not as a percentage of results. Tabara (2010:102), however, states that EVA is difficult to apply on a project that has a long-term gestation period, as it appears to be an instantaneous measure of value creation. Ohara (2010:33) who revealed that Sony, the Japanese electronics giant, introduced EVA and later dropped it because the

implementation of EVA impacted negatively on the projects that require a long period of gestation supported this view. Ohara (2010:33) further argued that the EVA adoption by Sony hindered investments in research and development, but revealed that the reason for Sony's failure after adopting it was linking EVA with executive compensation. It could be deduced, therefore, that management of Sony was more concerned with their compensations than with making EVA to work.

Ohara (2009:33) further reveals that the opposite was the case with Mitsubishi Corporation, which aligned EVA with its business model by developing what they described as Mitsubishi Corporation Value Added (MCVA). The development of MCVA by the company was merging EVA techniques with the company's risk management and performance measurement systems. Ohara (2009:33) moreover state that while Sony linked EVA with only executive compensation, Mitsubishi linked EVA with compensation at all levels, thereby making all employees to commit to value creation. The Mitsubishi experience confirms the assertion of Alam and Nizamuddin (2012:163) that a company should develop its own tailored EVA that is peculiar to its specific business strategies to benefit from the use of the metric.

It may therefore be appropriate to state that the success or failure of EVA implementation lies largely on steps taken to introduce the system to all levels of a company's stakeholders. The revelation by Ohara (2009:33) shows that if well implemented, EVA would result in a company's growth in value creation.

2.10.2 Shortcomings

Vasilescu and Popa (2011:62-64) and Ray (2012:265) identify the following as shortcomings associated with EVA metric:

- EVA does not take into account the timing of cash flow from a project;
- A company might report negative EVA in the short run from large investments that might require a long period of gestation, despite this, the project has the potential for high rates of return;
- A reduction in the amount of investment could increase EVA in the short-term; therefore, companies that embark on long-term projects could see EVA as not appropriate for reporting their performance;

- There seems to be no objective measurement of long term EVA results, rather, it could be subjectively estimated;
- Economic value added metric does not reveal growth in EVA that is caused by inflation;
- The numerous adjustments suggested in the calculation of EVA makes it too complex to apply;
- EVA is not considered suitable to all companies because the calculation takes capital into account;
- EVA is affected by a company's depreciation policy as it does not conform to the GAAP principles;
- The use of EVA for inter-company and inter-divisional comparisons may not be reasonable due to size effect.

It could be seen from the literature reviewed that the most mentioned disadvantage is that EVA is not suitable for a project that has a long-term gestation period. It should be noted that Sony experienced this disadvantage after the implementation of EVA due to not involving all stakeholders during the planning and implementation stages. This error was avoided by Mitsubishi, which linked EVA with compensation at all levels of the internal stakeholders, making all employees commit to value creation, which produced a success story for the company (Ohara 2010:48).

There is also the observation that EVA is not suitable for inter-company comparisons. However, inter-company comparative analysis could be by using a standardised EVA as suggested by De Wet (2012:66). The standardised EVA is obtained by dividing each company's EVA by economic capital employed in the company's operation throughout the year. Dividing a company's EVA by the economic capital gives what is described in this study as EVA return on capital employed (EVACE).

2.11 EVA ADJUSTMENTS AND FORMULA

2.11.1 Adjustments

Kaur and Narang (2008:43), Cunha Pinto and Machado-Santos (2011:71), Paragh (2012:8) and Khan, Chouhan, Chandra and Goswami (2012:117) have suggested that some adjustments be made in the calculation of EVA to minimise the effects of a

company's accounting policy. The abovementioned authors have indicated company policies to include the creation of provisions that do not involve actual cash flow and that could be used to 'window-dress' a financial statement to make the company appear profitable.

These are:

- Subtracting non-recurring income and expenditure from net operating profit;
- Research and development (R&D) costs: While IFRS may require such an item to be written off immediately, EVA adjustment advocates that they be capitalised and amortised over its useful time period;
- Goodwill is excluded from NOPAT calculation and from invested capital;
- Adding back interest expenses to profits and deducting the tax benefits of the interest;
- Taking out current liabilities from total capital as the cost for them is already charged to operating expenses;
- Investments in marketable securities: These, together with the income therefrom are included in capital;
- Adjusting deferred taxes to present only actual taxes paid;
- Excluding revaluation reserve from capital employed;
- LIFO reserves;
- Deferred tax.

Cunha Pinto and Machado-Santos (2011:71) further suggest factors that should guide the selection of items to adjust when calculating EVA. They include size of a company, available information, time constraints and size of the budget (Cunha Pinto & Machado-Santos 2011:71). Cunha Pinto and Machado-Santos (2011:71) state, however, that less than ten adjustments may be all that could be used when calculating EVA. Bolek et al. (2012:2) who argue that complicated measures would not be accepted by investors, as they may prevent them from controlling the effectiveness of fund management support this minimal adjustment.

2.11.2 EVA

EVA formula has been variously presented and these are stated in Formulae 2.1 to 2.4:

Formula 2.1

EVA = NOPAT-TC x WACC

Where:

NOPAT is net operating profit after taxTC is total capital costs (debt and equity) and

WACC is weighted average cost of capital

(Stern 2011:57)

Formula 2.2

EVA = NOPAT-Cost of invested capital.

Where:

NOPAT is net operating profit after tax;

Cost of invested capital being the product of the cost of capital (weighted average cost of capital) and invested capital.

(Chong, Fountaine, Her and Philips 2009:182-183)

Formula 2.3:

EVA = NOPAT – (WACC × Invested capital)

Where:

NOPAT = profit & loss before tax + interest expense – income taxes – tax shield on interest (tax rate × interest expense)

Invested capital = short term debt + long term debt + minority interest + shareholders' equity or,

Invested capital = total assets – current liabilities

WACC = weighted average cost of capital

WACC = [CD × (1- T)] + [CE ×] CMVE

CMVE = market value of equity (company’s share price × total shares outstanding)

CD = cost of debt

CE = cost of equity

T = tax rate

Market value of company = CMVE + total debt + minority interest.

(Nakhaei, Abdul Hamid, Anuar and Hakimpoor 2013:54-55).

Formula 2.4:

EVA = NOPAT – WACC x IC:

Where:

NOPAT = Net operating profit after tax

NOPAT = Operating profit x (1 - tax rate)

WACC = rD (1 – t) x D/D+E + rE x E/D + E (weighted average cost of capital)

IC = cash invested in the business by shareholders and creditors (Cunha Pinto & Machado-Santos 2011:71).

A careful look at the various formulae presented would reveal that they all could lead to the same result. The reason for this assertion is that all the formula have certain parameters in common. These common parameters are corporate tax, WACC, net operating profit and invested capital. However, for the purpose of this study, the formula presented in Formula 3.1 as obtained from INET- BFA (2017:3), which also contains the same parameters as the ones presented above, is applied. The reason is that the data for this study were obtained from INET- BFA and hence it is considered reasonable to apply the formula from the same source as the data.

2.12 CONFLICTING RESULTS OF STUDIES ON EVA

Khosravi, Fathi and Valinia (2014:105), Khan *et al*. (2012:118), Chong *et al*. (2008:182), Hamilton *et al*. (2009:275- 276) and Laing and Dunbar (2015:46) observe that research on EVA relationship with value creation remains inconclusive. The abovementioned authors state that while some researchers consider EVA a good measure of value creation, others do not view it as superior to the conventional techniques in measuring shareholder wealth creation

Chari (2009:56) and Sharma and Kumar (2012:814) identify reasons for the conflicting results as:

- The presence of scale effects in the use of R^2 and the panel data regression model in measuring value;

- The use of linear regression model whose assumptions could distort results.

Chari (2009:56), therefore, suggests the use of a non-linear S shaped function, which may better explain return-earnings relationships.

The observation made by Sharma and Kumar (2010:204) and the suggestion of Chari (2009:56) that a non-linear S-shaped function be used to analyse studies on EVA has influenced the choice of applying logistic regression analysis, a non-linear S-shaped function for analysing data in this study. The reason is to avoid the distortion of findings that could be possible with the assumptions of R^2 linear regression methods as observed by Chari (2009:56) and Sharma and Kumar (2010:204).

2.13 GLOBAL DISTRIBUTION OF STUDIES ON EVA

The popularity of EVA created much interest among researchers all over the world leading to more and more studies being carried out (Sharma & Kumar 2010:202). Sharma and Kumar (2010:202) analysed a number of researches on EVA from 1994 to 2008. The global coverage of studies on EVA as analysed by Sharma and Kumar (2010:202) is presented on Table 2.3. In addition, a number of articles and publications were reviewed in the course of this study to gain a good understanding of the concept and its application. Table 2.4 contains the number of articles and publications reviewed from various countries indicating a global interest on the subject of EVA.

Table 2.3 demonstrates the global interest in EVA. This suggests that the metric may be of value in that the tool is a good measure of company performance.

Table 2.3 International publications on EVA (1994-2008)

S/N	Country	No. of studies conducted
1	USA	51
2	India	21
3	South Africa	8
4	Australia	5
5	UK	2
6	China	2
7	❖ Others	23

❖ Others include Indonesia, New Zealand, Brazil, Turkey, Russia, Canada, Greece and Kuwait

(Source: Sharma & Kumar 2010:219).

The concept of EVA explored in this literature review for the period between 2008 and 2015 used different platforms. These include EBSCO-Host, Google Scholar and EMERALD/MCB. The research papers have been analysed based on year of publication, the author(s), the methodology used and the country in which the study was undertaken. The analysis is to show the global spread of study on EVA as a confirmation of its popularity in the global business management environment as a tool for measuring value creation.

Appendix 1, with the global spread of EVA, has been constructed in line with Sharma and Kumar (2010:214-217). However, an additional column has been added to show the countries where the respective studies are centred. The information in Appendix 1 shows that EVA has been of interest to researchers in virtually all the continents of the world. This development indicates the importance of EVA in measuring performance of companies. A summary of EVA global spread presented in Appendix 1 is shown in Table 2.4.

While Table 2.3 shows the analysis of a number of researches on EVA as presented by Sharma and Kumar (2010:219) between 1994 and 2008, Table 2.4 shows a summary of a number of the papers reviewed in the course of this study as published between 2008 and 2015. The presentation in Tables 2.3 and 2.4 indicated that the concept of EVA is now discussed globally. The concept that was born in the United States is in use in southern America, Eastern and Western Europe, including Russia and the Czech Republic. It is also a subject of interest in the Pacific and Asian countries of Japan, China, India, Iran, Australia and New Zealand. China and New Zealand have both adopted it in the state-owned enterprises. In Africa, the evidence is noticed in Ghana, Egypt, Kenya, Nigeria and South Africa. Bhasin (2013:195) states that more than 500 companies have adopted the EVA measurement. Ohara (2009:4) noted that as at 2009 that there were more than 50 Japanese companies that had adopted EVA.

Table 2.4 Global spread of study on EVA (2008-2015)

S/N	Country	No. of studies
1	Argentina	1
2	Australia	2
3	Botswana	1
4	China	3
5	Craiova	1
6	Czech Republic	2
7	Denmark	1
8	Egypt	1
9	Ghana	1
10	Indonesia	2
11	India	13
12	Iran	4
13	Japan	1
14	Kenya	2
15	Lithuania	1
16	Malaysia	7
17	Netherlands	1
18	Nigeria	1
19	Poland	1
20	Portugal	1
21	Romania	6
22	Russia	1
23	South Africa	3
24	Sri Lanka	1
25	Taiwan	1
26	United Kingdom	2
27	United States	5
	Total	66

2.14 SUMMARY

From the reviewed literature, the following arguments, positive as well as negative to the EVA concept and application are deduced:

- EVA has more information content to all company stakeholders than the traditional approach to performance measurement.
- That EVA presents real numbers and not ratios and percentage.
- That EVA could be used for various decisions such as stock valuation, resource allocation, capital budgeting, performance measurement and incentive planning.
- Companies could adapt and adopt their own tailored EVA that suits their own business model and risk.
- EVA is suitable for measuring the productivity of an economy as it is considered to measure the productivity of a country better than the traditional GDP calculus.
- EVA is applicable for both internal and external reporting.
- EVA assists managers to focus on shareholder wealth creation, which is the primary goal of the management.
- EVA is most suitable for the manufacturing companies.
- Certain company characteristics influence EVA performance.

Moreover, other arguments have emerged to challenge the support for EVA superiority in measuring company performance. These arguments are listed below:

- EVA adjustments make the tool too complicated and complex to apply.
- EVA does not favour projects with long gestation periods.
- Involving CAPM in EVA calculus makes it difficult to apply in some countries because of the difficulty in ascertaining beta of companies due to the state of the country's stock market.
- EVA does not apply to small companies.

Notwithstanding the arguments that are not in support of the use of the EVA metric in measuring company performance, the reviewed literature shows that several world-class companies have switched to using EVA to measure performance. The adoption by the world-class companies suggests that the EVA metric could be recommended to other companies that have not yet adopted it.

Based on the number of age-old, world-class companies that have adopted EVA, Dunbar (2013:63) suggests that whilst there may be inconsistencies in the findings by various researchers, much needs to be done in order to refine the model and make it of standard applicability. Furthermore, in view of the current scenario, it could be concluded that an intense competition is anticipated in the coming years such that companies would replace other performance measures with EVA and eventually be judged by the extent of value created for shareholders based on the EVA measurement (Srinivasan, Veerakumar & Balachandran 2012:6). In order to achieve its global uniform application, it is of paramount importance to consider introducing specialised accounting standards for calculating and reporting on EVA (Thilakerathne 2015:125).

This chapter presented the numerous literature reviewed in the course of this study. The literature provided an understanding of the publications and various conclusions of the authors on subject of wealth creation and measurement. The reviewed literature also gave insight into the notion about the influence of exchange rate and inflation on EVA. The next chapter contains the methodology applied in achieving the objectives of this research.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 INTRODUCTION

The preceding chapter contains the outcome of the literature review conducted in order to accomplish the theoretical objectives of this study. This study examined company characteristics that impact on EVA using logistic regression analysis. The measure of wealth created is determined by the application of EVA as a metric. This chapter discusses the procedure applied in gathering the necessary data required to ascertain the company characteristics that impact on EVA of the industrial companies listed on the JSE. In addition, the statistical tool applied in the data analysis is discussed. The chapter explains how results of this study are interpreted based on the outcome of the logistic regression analysis run on Statistical Package for the Social Sciences (SPSS), version 24.

This chapter also discusses how wealth created by the industrial companies is measured in this study. In addition, the chapter explains how EVA performances were influenced by exchange rates as well as rates of inflation during the corresponding years covered in this study.

There were 61 companies whose shares traded on the industrial sector of the JSE as at 31 December 2014. The study covers the period from 2005 to 2014, spanning at least two business cycles. A business cycle lasts for an average of five to six years (Investopedia 2017c). The choice for 2005 to 2014 is to ascertain how company characteristics impact their performance given the different business cycle features experienced during the period.

In this study, a business cycle is defined as the changes in economic activity experienced in an economy with the characteristic periods of expansion and recession respectively. During a period of expansion, the economy grows while contraction occurs in a period of recession. Between 2005 and 2014, the world witnessed at least two business cycles, which began to ease out from January 2014 (Investopedia 2017c). The 2007-2009 recession is said to have begun in December 2007 and was triggered by the rush for technology company-related stocks (Investopedia 2017e).

However, the recession preceding 2007-2009 was triggered by the unprecedented United States housing market stock speculations, which peaked in 2006 (Investopedia 2017e). The JSE-listed industrial companies have been exposed to the effects of the business cycles experienced during these periods.

3.2 DATA DESCRIPTION AND COLLECTION

The population for the study were all the 61 companies listed on the industrial sector of the JSE for the period of the study. The study did not make use of study samples but rather the entire population of industrial companies. The criteria for selecting a company for this study are:

- The company is an industrial company
- The company is listed on the industrial sector of the JSE
- The company has published data for the ten-year period from 2005 to 2014.
- The data was published on the INET-BFA platform for the period of study.

The 61 companies were listed on the mainboard of the JSE as at 31 December 2014; the period of the study. Any company that has incomplete data was not included. Only companies with the set of required data are included. In order to determine the effects of company's peculiar characteristics on EVA, the industrial companies have been structured or categorised, as suggested by Porter (1979:214). The categories are sub-sectors of manufacturing, retailing, extraction and property management; operating capital size of large, medium and small; capital gearing of high, moderate and low; products types of industrial and household consumables as well as local and international market segments. The categories are coded in line with Bolton (2009:48), as presented in Table 3.1, to convert metric random variables into categorical variables to suit logistic regression analysis.

The parameters and categories into which the industrial company characteristics have been grouped are presented in Table 3.1. Table 3.1 also shows the codes applied for each of the company categories for processing the data using the logistic regression analysis on SPSS.

The categorisation and the subsequent coding are to make it possible to build a logistic regression analysis model in order to ascertain the relationship between EVA and

company characteristics. Further reasons for grouping the industrial companies for this study into characteristics of market segments, sub-sector, product types, capital size and capital gearing and together with the categories ascribed to each of the parameters, is that each of the industrial companies falls within each parameter and shares the characteristics as well. Therefore, as the companies share in these characteristics, it becomes possible to build a model using logistic regression and then carry out comparisons based on the results of the analysis.

Table 3.1: Company characteristics and codes of the categories

Characteristics and categories	Code
Market segments:	
Export	M1[1]
Domestic	M2 [2]
Mixed	M3 [3]
Sub-sector:	
Manufacturing	S1 [1]
Extraction	S2 [2]
Retailing	S3 [3]
Properties	S4 [4]
Product types:	
Industrial raw materials	P1 [1]
Household consumables	P2 [2]
Equipment & Appliances	P3 [3]
Service firms	P4 [4]
Operating capital size:	
Large [greater than R10b]	C1 [1]
Medium [R1b-R9.99b]	C2 [2]
Small [R0 – R999m]	C3 [3]
Capital gearing:	
Highly geared [ratio 60:40] debt: equity	G1 [1]
Moderately geared [ratio 40:60]	G2 [2]
Lowly geared [ratio 20:80]	G3 [3]

The company characteristics are categorised as shown in Table 3.1. The market factor has categories of export, domestic or combined distributions coded M1, M2 and M3 respectively. The sub-sector factor is categorised into manufacturing, extraction,

retailing and property management coded S1, S2, S3 and S4 respectively. The product type factor is categorised into industrial raw materials, household consumables, equipment, appliances, and service firm. These are coded as P1, P2, P3 and P4 respectively. Operating capital size factor is categorised into large, medium and small with the codes of C1, C2 and C3 respectively. Capital gearing is categorised as highly, moderately and lowly geared with the codes of G1, G2 and G3 respectively.

3.3 CLASSIFICATION OF THE JSE-LISTED COMPANIES

Classification of the JSE-listed companies is by the use of the Industrial Classification Benchmark (ICB). The Financial Times Stock Exchange (FTSE/Russell) runs the ICB to classify companies. Categorisation is by allocating a company to the sub-sector that closely relates to the nature of its business, which is mainly determined by its primary source of revenue (FTSE/Russell 2017). FTSE is owned by London Stock Exchange (LSE) and The Financial Times. The FTSE is similar to Standard & Poor's, specialising in companies' index calculation. Standard and Poor (S&P global) is a rating agency. S&P global gathers intelligence in all parts of the world and delivers credit ratings, assessments and analyses that governments, companies and individuals depend on all over the world for business and economic decisions (S&P Global 2017).

South Africa sector comprising JSE-listed companies, groups all listed companies into three different areas of the economy (economic sectors). The areas are resources, financials and industrials. The criteria for selecting a company into these areas are the company's major source of revenue. This method of grouping companies into the sectors of the economy follows the standard set by ICB, which is a standard recognised globally.

The classification of JSE-listed companies is as shown:

- SA Resources – companies that are in basic materials coded "1000" as well as those in oil and gas coded "0001".
- SA Financials – companies in the financial sector coded "8000".
- SA Industrials – companies that do not fall into codes "1000", "0001" and "8000" respectively. This study is focused on the SA industrials whose shares are quoted on the main board of the JSE.

3.4 THE JSE LISTING CATEGORIES

The JSE has four listing categories: the Main Board and three separate secondary markets, which are the Development Capital Market (DCM) the Venture Capital Market (VCM) and the Alternative Exchange (AltX) (JSE 2017). The main board is for companies that are well established and that seek exponential growth for their companies (JSE 2017). The top 40 stocks on the JSE are listed on the main board (JSE 2017).

The DCM (Code J230) is for small to medium size companies with limited profit history that need a start-up capital for investment (JSE 2017). On the other hand, the VCM (Code J231) is for companies that hold portfolio of investments in venture capital projects (JSE 2017). Moreover, AltX (Code J232) is for every eligible company that has classes of ordinary shares quoted on the AltX (JSE 2017) (Table 3.2).

Table 3 2: JSE key listing requirements for the four boards

Criterion	Main Board	DCM	VCM	AltX
Advisor	JSE sponsor	JSE sponsor	JSE sponsor	Designated advisor
Number of shares	25 000 000	1 000 000	1 000 000	2 000 000
Minimum capital base	R25 000 000	R1 000 000	R1 000 000	R2 000 000
Profit history	3 years	2 years	Not required	Not required
Public spread	20%	10%	10%	10%
Number of shareholders	500	75	75	100

Table 3.2 summarises the key criteria needed to meet the listing requirements of the four boards on the JSE. Table 3.2 shows that the minimum capital requirement for companies in the JSE main board is R25 000 000. The 61 companies studied were listed on the main board of the JSE and each of them has a capital base that exceeds the required minimum during the period covered in this study (see Appendix 3).

The data for the research is obtained from the financial information provider INET-BFA (INET-BFA 2016), which is secondary data. Secondary data is the set of data, which already exists and is available for extraction for the purpose of a study (Kumar 2014:171). The data are in the public domain and are readily available. Therefore, it

is not necessary to obtain permission from the relevant companies to use the available information. The use of INET-BFA platform for data gathering for this study is informed by the availability, standardisation and reliability of data published thereon.

Some of the companies presented their reports in US dollar. However, historical exchange rates were obtained from the South African Reserve Bank website, which has been applied in translating the dollar denominated reports into South African rands. The historical exchange rates used were those applicable to each company's accounting year-end. In addition, one of the companies under study presented some of the reports in Zimbabwean dollar. This was also translated into rands using a historical exchange rates obtained from the Zimbabwean central bank website. The translations have been done in line with the International Accounting Standard (IAS) relating to foreign currency translations.

Data on companies obtained from INET-BFA for this study comprised of the historical EVA of industrial companies, which are the dependent variables. The formula applied in calculating EVA is presented in Formula 3.1

Formula 3.1

EVA =	Spread × CE
Where:	
Spread =	ROCE ÷ WACC
ROCE =	NOPAT ÷ CE
NOPAT =	Net operating profit after tax
ROCE =	Return on capital employed
WACC =	Weighted average cost of capital
CE =	Capital employed (INET- BFA 2017:3).

The companies' respective EVA were computed by applying the WACC obtained in accordance with the capital asset pricing model (CAPM). In calculating the equity portion of WACC, a risk-free rate represented by government bond at R186 was used (INET-BFA 2017: Marx, De Swardt, Pretorius & Rosslyn-Smith 2017:124). The market risk premium of six, which is the difference between risk-free rate and market return,

was applied. The premium of six is the return that is required from any investment, which would be the same as the return on government bond plus additional margin of return to compensate for the risk of investing (risk premium) (Investopedia 2017d). The risk premium is to compensate the investor for taking additional risk by taking up an investment in the security or portfolio.

The beta representing risk profile of the industrial companies during the study period was 0.3562 (INET-BFA 2016). The beta value of 0.3562 has been computed based on price of company shares in the past together with index of data from the market as a whole. The result shows how the company responded to the rising and falling situations of the market in general. Market beta coefficient equals one; therefore, any share whose beta is greater than the market coefficient is regarded as having more risk, while a company coefficient that is less than market coefficient is considered to have a lower risk (ICAEW 2017). The beta of 0.3562 used in the WACC calculation showed that the industrial company's shares were less volatile during the period covered in the study. Overall, the inclusion of beta coefficient in the calculation is because, as a measure of risk of individual security, it is required in the equation for the calculation of the rate of return for any share or portfolio of shares using the CAPM approach (Marx *et al*. 2017:124).

Other sets of data obtained for the analysis are the company characteristics. The company characteristics that form the independent variables are company capital gearing ratios. These are the ratios of long-term liabilities to equity capital (long-term debt/equity). In this study, ratio 40 percent debt: 60 percent equity is taken as moderate while ratio 60 percent debt: 40 percent equity is regarded as highly geared and 20 percent debt: 80 percent equity is regarded as low gearing. This categorisation of gearing ratio is in accordance with De Wet and Hall (2004:11) and Marx *et al* (2017:355).

Another set of data obtained from INET-BFA for the analysis includes the company product types. Company product types are classified into industrial raw materials, household consumables, equipment /appliances and service companies. Others are the market, which was categorised into exports, domestic and mixed, company capital size grouped, in accordance with Hamilton *et al.* (2009:281), into large (greater than

R10 billion), medium (between R1 billion and R9.99 billion) and small capital size (less than R1 billion) and company sub-sector to which each of the companies belong. Sub-sector is categorised into manufacturing, extraction, retailing and properties management.

EVA of the companies were applied to examine companies that created value and those that did not create value by classifying company performance into EVA positive or EVA negative. The company characteristics were applied in achieving the main research objectives by ascertaining if capital gearing, size of company operating capital, company's market segment (import or export sales), product types (industrial or household goods) and sub-sector impact on EVA. Motivation for determining impact of the company characteristics of market segments, product types, operating capital size, sub-sector and capital gearing on EVA is that they are the parameters that could be considered, alongside company EVA performance, when making investment decisions (Lodhi 2014:70). The attributes of market segments, product types, operating capital size, sub-sector and capital gearing require consideration when making investment decisions because they are the parameters that contribute in showing if a company would remain viable in the near future

Historical exchange rates and historical inflation rates were tabulated together with EVA in order to have overview of their relationship based on their respective changes over the period covered in this study. However, instead of using absolute EVA in the comparison, EVA return on capital employed (EVACE) was used. EVACE was calculated by dividing companies' economic capital by the value of EVA achieved (see Appendix 4). The reason for using EVACE instead of absolute EVA is to achieve a uniform basis of comparison by basing EVA on company's capital size as suggested by De Wet (2012:66).

3.5 DATA ANALYSIS TOOL AND PROCEDURE

As mentioned in chapter 1 of this study, a quantitative method is applied in the data analysis. A quantitative research involves applying mathematical, computational and statistical techniques to obtain research results. (SIS 2019). Consequently, the logistic

regression analysis, being a statistical tool applicable for a quantitative research is suitable for this data analysis in order to find answers to the research questions.

Logistic regression analysis (Logit) is used in this study to determine the impact of industry structure (company characteristics) on EVA. Suttle (2017:1) defines industry structure as the number and size distribution of competitors in an industry. However, in this study, industry structure is defined as the characteristics and the categories of the industrial companies on the JSE. The characteristics are explained using the parameters of market segments, companies' product types, capital size, the sub-sectors that the respective companies belong, as well as the capital gearing ratios.

Logistic regression measures relationships between many independent variables and one dependent variable (Park 2013:154). A coefficient, also known as intercept, shows the degree of the relationship between each independent variable and the dependent variable. In this study, EVA is dependent variable while company characteristics of market, product, sub-sector, company capital size as well as capital gearing form the independent variables. The logistic regression analysis has been applied in this study to measure the impact of company characteristics of market segments, product types, sub-sector, operating capital size as well as capital gearing on the outcome variable of EVA. Logistic regression analysis is normally applied in determining relationships between a dependent variable with two possible (binary response) outcomes and many independent variables. A binary response consists of success or failure. In this study, the outcome variable is categorised as positive EVA (Y=1) and EVA negative (Y=0). This dependent variable is binary; hence, logistic regression could be applied.

In the analysis, odds is calculated. Odds show the likelihood of an event happening. It shows, for example, how export markets are more likely to impact on EVA than domestic distribution. Thus the formula for calculating odds is:

Odds = p/(1-p). Where p is the predictor variable or probability of interested outcome. (Park 2013:155).

This is referred to as unconditional odds, that is, odds in the sample as a whole. In this study, the interest is in how some other variables within the industry structure affect EVA outcome, described as conditional odds. Therefore, odds ratio (OR) is used

instead of the odds. OR is obtained by exponentiating the odds denoted as ß. Thus, the formula is given as $e^{ß}$. The log of the OR shows relationship between EVA (dependent variable) and company characteristics (independent variables). (Park 2013:155).

Logistic regression is a model used when the dependent variable is such that it gives two possible outcome categories, for example, pass or fail, survive a disease or not survive a disease. In this study, dependent variable EVA has either positive or negative outcome. The study is on whether a company's characteristics contribute in achieving a positive EVA, which means that the company has created value, or negative EVA, which means that the company has destroyed value.

However, for simplicity of interpretation, clarity of meaning and easy understanding, the outcome of the logistic regression analysis for this study is interpreted using the p-value, in conjunction with odds ratios.The odds ratios of the independent variables is converted into probabilities as suggested by Knowledge Exchange (2019) using the formula propounded by Simon (2013:1-2). Converting odds ratios to probabilities is to offer more clarity in understanding the meaning of the logistic regression numbers (Osborne 2006:5). Moreover, the year that records the highest number of significant factors is used for the analysis and interpretation of results in this study. However, consolidated tables and analysis showing the p-values and other logistic regression data output for all the years is presented in Chapter 4 of this study.

3.6 ASSUMPTIONS OF LOGISTIC REGRESSION ANALYSIS

When using logistic regression as an analysis tool, certain assumptions need to be tested (Statistics Solutions 2017). For the logistic regression model used in this study, some assumptions are not important. Below is a brief discussion on assumptions as they relate to logistic regression:

3.6.1 Linearity

Linear regression assumes a linear relation between the dependent and independent variables. Logistic regression analysis does not require a linear relation, as variables are categorical. In this study, EVA, which is the dependent variable, is changed from

continuous random variable to categorical variable to suit logistic regression. Logistic regression analysis demonstrates linear relation between dependent and independent variables through the logit of the dependent variable.

3.6.2 Independent errors

The assumption of independent error indicates that error should not relate to two samples of a study. This assumption is usually broken, particularly in a study on education where learners are categorised into different sets, classes and schools. Learners tend to behave differently according to the value orientation of their respective schools. This means that there is no uniform behaviour pattern for learners who are from different school environments though learners from the same school may tend to behave alike. This assumption may be related to the theory of industrial organisation, which views the industry as a homogeneous unit (Porter 1979:214). Porter (1979:214) states further that company in one industry are assumed alike in all economically important dimensions. The companies in this study are the 61 listed on industrial sector of the JSE. The industrial companies are considered alike in this study as they all operate as holding companies to many subsidiaries

3.6.3 Multicollinearity

Multicollinearity indicates that independent variables in a study should not have a linear relationship with one another. The independent variables should be independent from each other. However, in logistic regression, independent variables are often correlated with each other to some degree. Regarding this study, the independent variables of market segment and product type, for example, could be related to some degree. The relationship is explained by the fact that certain company products may be designed for specific market segments. However, the issue of multicollinearity could be resolved by breaking variables into categories (Statistics Solutions 2017).

3.7 ADVANTAGES OF USING LOGISTIC REGRESSION

The following factors indicate the advantages of using logistic regression analysis (Fang (2013:626); Wurtz & Gamboa (2014:4)):

- The independent variables do not have to be normally distributed.

- Independent variables could be continuous or dichotomous as is the case with company characteristics.
- Dependent and independent variables may not have to possess any linear relationship, as is the case with EVA and company characteristics.
- The existence of multicollinearity among variables does not affect the results obtained from analysis as variables could be stated in categories.
- Logistic regression has a low variance and so is less prone to over-fitting.

3.8 APPLICATION OF LOGISTIC REGRESSION

As earlier stated, logistic regression analysis is used to predict dichotomous outcomes (example: success/failure). EVA, as a dependent variable, is of interest and well suited for dichotomous analysis, since it is either EVA positive or EVA negative. However, EVA could be zero, if the company earns just enough to pay its cost of all capital. In this study, none of the companies achieved a zero EVA. Logistic regression is standard in packages like SAS, STATA and SPSS. For this study, the logistic regression is run on SPSS for Windows 14.0. SPSS, version 24, was applied to analyse data collected. The motivation for application of SPSS in analysing data is due to its versatility in application and popularity in academia and business analyses (Arkkelin 2014:2)

Moghadas and Salami (2014:206) used Logit in predicting financial distress in firms listed on the Teheran Stock Exchange using financial data of bankrupt and non-bankrupt companies as independent variables. The results show that the logistic regression model is 89 percent accurate to predict company financial distress. In this study, the logistic regression model shows a ten-year lowest prediction accuracy of 63.2 percent in 2011 and the highest of 97.2 percent in 2006 to predict impact of company characteristics on EVA.

Upadhiyay, Brandyopahyay and Dutta (2012:16) used Logit to forecast share performance in Indian stock market. The study of Upadhiyay *et al*. (2012:16) involved the use of seven financial ratios as independent variable categorised into “GOOD”, “AVERAGE” and “POOR”. Categorisation of shares in the study was by comparing return on shares of companies with that of the market. The objective was to investigate

and determine the accounting ratios that influence share price changes. Upadhiyay *et al*. (2012:16) classification showed a predictive accuracy rate of 56.8 percent. Upadhiyay *et al.* (2012:16) suggested that their model could enhance investors' stock price forecast ability. In this study, operating capital size is categorised into large, medium and small, while capital gearing is categorised into highly, moderately and lowly geared (see Table 3.1).

Chandrasekaran and Kumar (2012:975) applied logistic regression analysis to predict a project to completion using data pertaining to information technology projects. Data obtained were described as baseline cost, planned value, earned value and actual cost. The analysis was found applicable for forecasting cost of executing a project to minimise incidence of over-spending on a project. In this study, categorical variable coding provides the factors to use as the baseline categories. The baseline categories could be the first or the last category of a factor depending on the choice in SPPS. Therefore, the last category serves as baseline category to compare with the factors that are significant in the study.

Hassani and Parsadmehr (2012:142) used logistic regression analysis to forecast financial crisis among companies quoted on the Tehran Stock Exchange from 2002 to 2009 using financial ratios as variables. The logistic regression model indicated a forecast strength of 81.49 percent. Achia, Wangombe and Khadioli (2010:38) used logistic regression to determine factors that influence poverty in Kenya using data on demography and public health. Results obtained showed a relationship between the dependent and independent variables used for the study.

Muchabaiwa (2013:72-73) applied logistic regression to determine factors that influence change in the price of the stock of companies quoted on JSE. Variables for the study were assets/capital employed, debt/assets, debt/equity ratio, dividend yield, earnings/ share, earnings yield, operating profit margin, share price, earnings, ROA, ROE and return on capital employed (ROCE). Result obtained showed return on capital as influencing change in share price of companies. Muchabaiwa (2013:72-73) used change in share price as the binary dependent variable and certain accounting ratios as the independent variables. This supports the use of EVA as binary dependent variable and company characteristics as independent variables in this study.

Logistic regression analysis is applied in this research to examine the influence of market segment, operating capital size, capital gearing and product type and company sub-sector on EVA. The analysis is reinforced by Porter (1979:215) and Suttle (2017:1) whose studies suggest that company characteristics of market segment, operating capital size, capital gearing, product types and sub-sector might have a relationship with company profitability.

3.9 LOGISTIC REGRESSION ANALYSIS

Logistic regression produces certain outcomes that provide answers to the research questions. The outcomes result from calculations carried out for determining the appropriateness of the model for the analysis. To evaluate how good and fitting is the model for the analysis, a deviance was computed. If the p-value of deviance is greater than 0.05 it indicates that some variables in the model are significant in determining the impact of independent variables on EVA. Outcomes are discussed as produced on SPSS.

3.9.1 Omnibus test of model coefficient

The omnibus test statistic assesses whether there is relationship between EVA and company characteristics. Omnibus test of p-value less than 0.05 implies that logistic regression analysis is appropriate for the data collected for the study. Omnibus test with p-value <0.05 shows that logistic regression is appropriate for the analysis.

3.9.2 The Hosmer-Lemeshow

To confirm suitability of the logistic regression model for this analysis, the Hosmer-Lemeshow test was carried out. Hosmer-Lemeshow test compares predetermined and actual values of EVA. Where p-value is greater than 0.05, the model is acceptable for the analysis.

3.9.3 The Wald assessment of independent variables

Wald statistic was applied in assessing degree of importance of each category of company characteristics in influencing EVA. A coefficient of p-value less than 0.05

indicates the company characteristics that are important in the model and p-values greater than 0.05 are not important in the model.

3.9.4 Model summary

The model summary has values indicating the extent to which data for the analysis are appropriate in building the logistic regression model. The -2 Log likelihood shows if adding the variables for the study could improve the power of the model in predicting results of the study. The Cox & Snell R^2 explains level of changes in EVA by applying the model, while the Nagelkerke R^2 indicates strength of the relationship between the dependent and independent variables used in the study.

3.9.5 The classification table

The classification table indicates how well the model predicts impact of independent variables on EVA. The high overall percentage indicates that the model is suitable for the analysis.

3.9.6 Variables in the equation

Variables in the equation table contains all the dependent and independent variables used in building the logistic regression model. The following columns are produced in the table:

B (coefficient) is the coefficient of independent variables known also as \“the intercept in null model. The coefficient indicates the extent of the relationship between the dependent and independent variable and if the relationship is positive or negative.

S.E is the standard error surrounding the coefficient for independent variables.

df is the degree of freedom. Each independent variable has one degree of freedom.

Score and sig (p-value) shows the level of significance of independent variable, also described as p-value.

3.9.7 Exp (ß) (odds ratio). Exponent of coefficient of independent variables known as the odd ratio (OR). This explains the chance of a change in the dependent variable caused by impact of independent variable, if other variables are held constant

3.9.8 Constant. The constant term in a logistic regression represents the log-odds of dependent variable = 1, versus dependent variable = 0, if all independent variable values are zero. For example, in this study, the constant values show probability of EVA outcome without the impact of any company characteristics stated in the research.

3.10 CATEGORICAL VARIABLE CODING

Another table provided for data analysis by logistic regression is the categorical variable coding. The categorical variable coding provides the factors used as the baseline categories. The baseline categories are the factors that are not significant among the categories within company characteristics that are significant. Therefore, the baseline categories serve as the baseline factor to compare with the factors that are significant in this study.

3.11 INTERPRETATION OF RESULTS

The outcome of the logistic regression analysis for this study is interpreted by applying a p-value together with odds ratios and the coefficients. Furthermore, the odds ratios of the independent variables are translated into statistical probabilities using Simon's (2013:1-2) formula. The aim is to keep a simple interpretation and clearer meaning of results for easy understanding of the logistic regression numbers. However, in order to avoid repeating same explanations year by year, the year that records the highest number of significant factors is used for the analysis. However, consolidated tables and analysis showing the p-values and other logistic regression data output for all the years are presented in Chapter 4 of this study.

3.12 SUMMARY

This chapter described the method of data gathering, analysis of data as well as the interpretation procedure in order to satisfy the research problem, which is to determine the impact of company characteristics on the industrial companies' wealth creation.

Secondary data required for the study have been obtained from INET-BFA. The secondary data obtained includes companies' EVA, operating capital size, market segment, product types, capital gearing and sub-sectors. The various logistic regression outputs on SPSS for data analysis are discussed in the chapter. The chapter explained how data are processed using the logistic regression analysis run on SPSS and how the outcome are interpreted. Results obtained in this chapter are fully analysed and interpreted in the next chapter.

CHAPTER 4

ANALYSIS OF DATA AND INTERPRETATION OF RESULTS

4.1 INTRODUCTION

The previous chapter discussed the methodology applied in this study. The chapter described the data collection, processing and reporting techniques. In this chapter, the results of the data collected for the study are analysed using the logistic regression analysis. The results were analysed and interpreted. The first part of the chapter contains the description of the variables used in building the logistic regression model to obtain the results that provide solutions to the research objectives stated in Chapter 1. The model formula and parameters used in classifying the variables, as well as the study population (number of companies: N=61) are also presented within the first part of this report. The chapter further contains the various tests carried out in order to assess the appropriateness of the model for this analysis. Furthermore, the chapter contains a presentation of company characteristics found to be significant in this study as well as explanations and how the results have been interpreted.

The second part of this chapter contains analysis of wealth creation of the companies using EVA as a metric. Furthermore, the chapter contains a comparison of EVA, inflation and exchange rates.

4.2 ANALYSIS OF RESULTS

Logistic regression analysis run on SPSS was used to determine impact of the independent variables (company characteristics) on EVA (dependent variable). The dependent variable (EVA) is binary, while independent variables (capital size, product types, market segment, sub-sector and capital gearing) are categorical. Table 4.1 shows the factors used to build the logistic regression model.

Table 4.1 Factors in the logistic regression model

Variable	Dependent/Independent	Variable Type
EVA	Dependent	Binary
Capital size,	Independent	Categorical
Product types	Independent	Categorical
Market segment	Independent	Categorical
Sub-sector	Independent	Categorical
Capital gearing.	Independent	Categorical

4.2.1 Companies used in the analysis

The population for this study are 61 industrial companies listed on the JSE. However, the total number of companies included in the calculations are the 59 companies that have complete data required for this analysis and published on INET-BFA as at 31 December 2014. Therefore, the cases (individual companies) included in the analysis were 59 companies.

The 59 companies included in the analysis were multiplied by six records of each company characteristics stated (EVA, operating capital size, market segment, capital gearing, product type and sub-sector) to get a total of 354 records. This study does not involve the use of samples, rather the entire population of the industrial companies listed on the JSE and hence the measurement of the adequacy of a number of records or samples does not apply in the analysis. The claim for adequacy of the population size for this study is supported by Peng *et al.* (2002:10) who suggested a minimum sample size for multivariate statistics such as logistic regression analysis to be 50. In this study, the total population size is 59 as at 2014. Therefore, it could be considered adequate since the population is greater than the minimum sample size as suggested by Peng *et al.* (2002:10).

Achia *et al.* (2010:39) used a sample selected from a population of 400 households while Bayaga (2010:291) used a population size of 100. Upadhiyay *et al.* (2012:16) used total population of 30 large market capitalisation companies. Based on the work of Upadhyay *et al.* (2012:16) who used a population of 30 companies, a population of 36 companies for 2005 analysed in this study could be considered adequate. Moreover, Hosmer and Lemeshow (2000:347) state that the adequacy of study sample would be determined by the size of the study population.

Table 4.2 shows the number of companies included in the analysis for each year from 2005 to 2014. The number of companies rose from 36 in 2005 to 59 in 2014. The reason for having different number of companies per year is that some companies were listed on the JSE after 2005. However, other companies were listed, but did not publish their financial statements on INET-BFA, therefore, only JSE-listed companies that published complete data in all the years covered in this study have been included in the analysis.

Table 4.2 Companies used in the analysis 2005-2014

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Included	35	36	43	53	54	54	57	58	58	59
Missing	1	1	1	1	1	1	1	1	1	0
Total	36	37	44	54	55	55	58	59	59	59
Not included	0	0	0	0	0	0	0	0	0	0
Total	36	37	44	54	55	55	58	59	59	59

Bergtold, Yeager and Featherstone (2011:9) state that size of the sample should not be a serious factor to consider if a study is aiming to produce a result that is meaningful and to be interpreted. Based on the suggestion of Bergtold *et al.* (2011:9) and Hosmer and Lemeshow (2000:347), even the population size of 36 companies in 2005, which is the least in the ten-year study period, is acceptable for this analysis. The adequacy of the population size for this study is further confirmed by the goodness of fit tests carried out in order to confirm the suitability of the model. The results show that the model with this population size is fit for the analysis

4.2.2 Testing for the model fit

The model was tested for goodness of fit to ascertain how appropriate the model fits the data in order to obtain the necessary results to satisfy the empirical objectives stated in Chapter 1 (Section 1.4.3) of this thesis. That is, how effectively the logistic regression model built for this study describes the outcome variable (EVA). In ascertaining goodness of fit, the following tests were carried out: the Hosmer-Lemeshow test (Table 4.3), classification accuracy (Table 4.4, 4.5 & 4.6), omnibus test (Table 4.7 & 4.8) and model summary (Table 4.9 & 4.10). The goodness of fit tests are briefly discussed.

4.2.2.1 The Hosmer-Lemeshow test

The Hosmer-Lemeshow test compared predicted outcomes with actual outcomes of EVA. If p-value (0.669 for 2014) for the Hosmer-Lemeshow is more than 0.05, it confirms that a model is appropriate for the study, and then there is a confirmation that EVA may be explained by company characteristics. In this study, p-values is used to interpret Hosmer-Lemeshow test.

Table 4 3 Hosmer-Lemeshow test 2005-2014

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Chi-square	0.000	0.000	1.294	3.590	8.377	3.308	6.285	7.660	5.080	4.925
Degree of freedom	4	4	8	8	8	8	7	8	7	7
P-value	1.000	1.000	0.996	0.892	0.398	0.914	0.507	0.467	0.650	0.669

Table 4.3 contains outcomes of Hosmer-Lemeshow test for the ten years to 2014. Results of Hosmer-Lemeshow test in Table 4.3 indicate goodness of fit for the use of logistic regression in the analysis of this study. As indicated earlier, a p-value > 0.05 implies a good fit of the logistic model. As could be seen in Table 4.3, the p-values range from 1.00 in 2005 and 2006 to the least of 0.398 in 2009. Notwithstanding, the result shows that p-values were > 0.05 in all the years, therefore, implying a good fit of the logistic model for this study.

4.2.2.2 Classification accuracy

Classification accuracy shows the predictive accuracy (the forecast strength) of the logistic model for the analysis. If a model containing dependent and independent variables shows any improvement over the model with dependent variables, only then is the model considered well fitted for the analysis. Table 4.4 presents the results for 2014 where only the dependent variable (EVA) is included, before any coefficients (company characteristics) are entered into the equation. Logistic regression compared the model with dependent variables alone with that of the full model (Table 4.5) containing all the variables (dependent and independent) to determine if the latter model would be more appropriate by showing an improvement in the overall percentage.

Table 4.4 Classification accuracy table without independent variables 2014

Observed		Predicted		
		EVA coding		Percentage correct
		Negative	Positive	
EVA	Negative	0	27	0.0
EVA	Positive	0	32	100.0
Overall Percentage				54.2

Note: P-value (deviance) is 0.50

The deviance measures how good the logistic regression model is. A p-value of deviance more than 0.05 implies that there are factors in the model necessary to evaluate impact of company characteristics on EVA. A p-value of deviance > 0.50 (Table 4.4 and Table 4.5) was obtained from this analysis confirming that the factors of market segment, product types, capital gearing, capital size and sub-sector are important in evaluating impact of company characteristics on EVA.

The 59 companies used in this analysis in 2014 (Table 4.4) were made up of 27 with EVA negative and 32 with EVA positive. Table 4.4 shows that the 27 companies with negative EVA records were not correctly classified as negative, leaving none correctly classified, therefore, giving zero percentage correct classification for EVA negative. Table 4.4 also shows that 32 EVA positive have been correctly classified, with zero not correctly classified, therefore, giving a 100 percentage correct classification for EVA positive. The reason for the classification errors observed in Table 4.4 and Table 4.5 is because when classifying the set of binary data of EVA positive and EVA negative, the same observations used to fit the model were also used to estimate the classification error. However, the overall percentage correct classification for both positive and negative EVA is 54.2 percent [(32 ÷ 59) × 100]. That is, without the inclusion of the independent variables, the prediction was correct up to 54.2 percent. This means that EVA would be affected by the independent variables up to 54.2 percent. This is compared with Table 4.5 where all the variables have been included (both dependent and independent). The differences in the figures on the classification tables and the overall percentages show to what extent company characteristics impact on EVA.

Table 4.5 Classification accuracy table with independent variables 2014

Observed		Predicted		
		EVA coding		Percentage correct
		Negative	Positive	
EVA	Negative	21	6	77.8
EVA	Positive	4	28	87.5
Overall percentage				83.1

Note: P-value (deviance) is 0.50

Table 4.5 presents the result for 2014 when the predictors (company characteristics) have been included in the equation. Table 4.5 reveals that EVA negative is correctly classified by 77.8 percent [(21÷27) ×100], as against 0 percent in Table 4.4, while the EVA positive is correctly classified by 87.5 percent [(28÷32) ×100] compared to the 100 percent in Table 4.4. Table 4.5 shows that the classification accuracy has improved from 54.2 percent to 83.1 percent. The result shows that the prediction outcome is 83.1 percent accurate. That is predicting the impact of company characteristics on EVA is correct to 83.1 percent using the logistic regression model for this study.

The improvement from 54.2 percent to 83.1 percent shows that the model is good for the prediction. The claim that the classification result of 83.1 percent for 2014, or the least of the ten-year analysis of 63.2 percent in 2011 (Table 4.6) shows a good fit for the study, is backed up by Upadhyay *et al.* (2012:16) whose classification result was 56.8 percent. With overall percentage of 56.8 obtained by Upadhyay *et al.* (2012:16), the result obtained was considered acceptable for publication as it provided answers to the research questions. Consequently, an overall percentage of 83.1 percent in 2014 or 63.2 percent in 2011 for this study is quite good in measuring the model fit.

Table 4.6 shows summery of classification accuracy for the ten years to 2014 covered in the study. Step 0 are the results of the classification with the absence of independent variables (company characteristics), while step 1 contains results of the logistic model with company characteristic added. The improvement of the outcome for each year, comparing the outcome of step 0 and step 1, show a good fit of the logistic model for the analysis for the ten years covered in this study.

Table 4.6 Consolidated classification accuracy 2005-2014

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Step-0	89.2	91.7	78.2	79.2	55.6	53.7	57.9	56.9	58.6	54.2
Step-1	95.3	97.2	81.4	86.8	72.2	64.8	63.2	67.2	75.9	83.1

Note: Step-0: classification table without independent variables

Step-1: classification table with independent variables.

Table 4.6 shows classification accuracy to be highest in 2006 by improving from 91.7 percent to 97.2 percent. However, the most significant improvement was in 2014, which showed improvement from 54.2 percent to 83.1 percent. Overall, however, the classification accuracy shows improvement between Step 0 and Step 1 for all the years and hence, the indication of a good fit of logistic regression model for this study.

4.2.2.3 Omnibus test of EVA relationship with company characteristics

The omnibus test (Table 4.7) was applied to determine EVA relationship with company characteristics. Table 4.7 shows the chi-square test statistics and the p-values for the model used in this study for 2014.

In 2014, the chi-square statistic showing difference between null and full model is 36.739 at 12 degrees of freedom and a p-value less than 0.05 level of significance. The values for the step and the block are equal to model value (36.739). This is because dependent and independent variables were added at the same time. P-value of 0.000 is less than 0.05, implying an improvement in the adequacy of the model for the analysis. This means that company characteristics applied in the study is appropriate in determining the impact on EVA. This result confirms the suitability of logistic regression analysis model for the data used for the study.

Table 4.7: Omnibus test of EVA relationship with company characteristics 2014

	Chi-square	Degree of freedom	p-value
Step	36.739	12	0.000
Block	36.739	12	0.000
Model	36.739	12	0.000

The omnibus test has been used to test for relationship between EVA and company characteristics. Results of 2007 and 2014 (Table 4.8) show p-values less than 0.05 while results of other years show p-values greater than 0.05. P-values less than 0.05 show a good relationship between EVA and company characteristic in this study, while p-values greater than 0.05 shows no relationship between EVA and company characteristics. That means company characteristics do not impact on EVA in the years with p-value < 0.05.

Table 4.8 Consolidated omnibus test for the years 2005-2014

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Chi-square	11.254	17.880	26.037	18.841	15.384	16.276	9.235	12.972	19.732	36.739
Degree of difference	10	11	12	12	12	12	12	13	12	12
p-value	0.338	0.094	0.011	0.092	0.221	0.179	0.683	0.450	0.072	0.000

Table 4.8, which shows the consolidated Omnibus test for the ten years indicate that only 2007 with p-value 0.011 and 2014 with p-value 0.000 show EVA to be impacted by company characteristics. Other years show p-value greater than 0.05, indicating that company characteristics did not impact on EVA during the period.

4.2.2.4 Testing strength of EVA relationship with company characteristics

Model summary provides values indicating how good the model fits the data and the linear relationship between EVA and company characteristics.

Table 4.9 Model Summary for 2014

-2 Log likelihood	Cox & Snell R-square	Nagelkerke R square
44.628	0.464	0.619

The -2 log likelihood for this model is 44.628 (Table 4.9). Cox & Snell R square of 0.464 indicates that 46.4 percent of changes in EVA are explained by factors in the company characteristics. However, in this study, the Nagelkerke R square, which is the mostly applied among R-square calculations, is used in this analysis to interpret the strength of relationship between EVA and company characteristics. Nagelkerke R square of 0.619 or 61.9 percent in 2014 indicates strong relationship between company characteristics and EVA in his study. Table 4.10 contains a consolidated model summary for the ten years to 2014.

The model summary (Table 4.9 and Table 4.10) show a strong relationship between EVA and company characteristics in this study. This suggestion is evidenced by the outcome of the Nagelkerke R square, which shows 89.7 percent and 61.9 percent for 2006 and 2014 respectively.

Table 4.10 Consolidated model summary for the years 2005-2014.

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
-2Log Likelihood	2.65	2.773	15.3	35.29	58.81	58.29	68.36	66.33	59.0	44.63
Cox & Snell R square	0.300	0.391	0.454	0.299	0.248	0.260	0.150	0.200	0.288	0.464
Nagelkerke R square	0.750	0.897	0.736	0.468	0.332	0.348	0.201	0.269	0.388	0.619

Table 4.10 show Nagelkerke R square of 75.0 percent, 89.7 percent, 73.6 percent and 61.9 percent in 2005, 2006, 2007 and 2014 respectively indicating a strong relationship between EVA and company characteristics. However, results for other years in the study show less relationship between EVA and company characteristic by having Nagelkerke R square less than 50 percent respectively.

In conclusion, results of various tests enumerated confirm company characteristics could explain much of the variations in EVA in this study. In addition, results of the tests for the model fit showed that logistic regression model established relationship between company characteristics and EVA.

4.3 THE BASELINE CATEGORIES

As indicated in Chapter 3 (Section 3.10) of this study, the baseline category is used to compare with other categories. The categorical variables coding (Table 4.11) shows the parameters used in classifying the industrial companies for this study. The classification serves to obtain the required result, which is to determine company characteristics that affect value creation among the industrial companies on the JSE. Table 4.11 also shows the frequency of occurrence of each company category including the baseline categories for each factor. The factors are classified into categories and SPSS automatically chose the highest in the categories as the baseline categories for each of the significant factors. Therefore, the last category of each of the three significant factors is used as the baseline category to compare with the other categories.

The baseline category for the sub-sector factor is properties management category (S4), the baseline category for the capital size factor is the small capital category (C3) and the baseline category for the gearing factor is the lowly geared (G3). Therefore, each category of the significant factors are compared with the baseline category of that factor. Table 4.11 displays the five factors of product types, sub-sector, capital gearing, market segments and capital size. The company categories used for the analysis are those that are shown in Table 4.13 while those used as baseline are those not shown in Table 4.13 (M3, P4, S4, C3 & G3). The baseline categories are compared with the other categories that are shown in Table 4.13 in relation to the degree of impact on EVA. The baseline categories within each significant factor are the company categories that do not have any impact on EVA.

Table 4.11 shows codes used for the company categories. The company categories for market segment factor compared are M1 and M2 (export and domestic) while M3 (mixed) is the baseline category for comparison. S1, S2 and S3 (manufacturing, extraction and retailing) compare with S4 (property management), which is the baseline category. Furthermore, P1, P2 and P3 (industrial raw materials, household consumables and equipment and appliances) are compared with P4 (services), the baseline category. C1 and C2 (large and medium capital sizes) are compared with C3 (small capital size), the baseline category. G1 and G2 (highly and moderately geared) are compared with G3 (lowly geared), the baseline category.

Table 4.11 Company characteristics and categories

Factors		Frequency	Codes for the categories		
			1	2	3
Product:	P1	11	1.000	0.000	0.000
	P2	2	0.000	1.000	0.000
	P3	16	0.000	0.000	1.000
	P4	30	0.000	0.000	0.000
Sub-sector:	S1	14	1.000	0.000	0.000
	S2	2	0.000	1.000	0.000
	S3	27	0.000	0.000	1.000
	S4	16	0.000	0.000	0.000
Gearing:	G1	30	1.000	0.000	
	G2	2	0.000	1.000	
	G3	27	0.000	0.000	
Capital size:	C1	21	1.000	0.000	
	C2	27	0.000	1.000	
	C3	11	0.000	0.000	
Market:	M1	1	1.000	.000	
	M2	17	0.000	1.000	
	M3	41	0.000	0.000	

4.4 TEST FOR SIGNIFICANT COMPANY CHARACTERISTICS FOR 2005-2014

Results of the logistic regression model are used in this study for the analysis. The results from this analysis are interpreted using the variables in the equation (Table 4.13 for 2014).

The variables in the equation contain a number of columns, which have been explained in Chapter 3 (Section 3.9.6). These columns are the coefficient, standard error and the Wald. Others are degree of freedom, p-value and odds ratio. Consolidated tables for the ten years covered in this study have been prepared for each of these columns in tables 4.12, 4.14 and 4.15.

As stated in Chapter 3 (Section 3.11) of this study, the p-value is used to determine factors that are significant. The significant factors are observed from the p-value column. Consolidated p-values are presented in Table 4.12 and show factors that are significant and those not significant in the ten years covered in this study. With

reference to Table 3.1 of Chapter 3 of this study, the main factors are labelled M for market segment with market categories as M1 for export, M2 for domestic and M3 for mixed market segments. Sub-sector is labelled S and manufacturing category as S1, extraction as S2, retail as S3 and properties management as S4. The product type factor is labelled P with P1 for industrial raw materials, P2 for household consumables, P3 for equipment and appliances and P4 for service companies. The operating capital size factor is labelled C with C1 for large capital size, C2 for medium capital size and C3 for small capital size. The capital gearing factor is labelled G with G1 for highly geared, G2 for moderate gearing category and G3 for low gearing category. Significant factors are those with p-value 0.05 or less while those with p-value more than 0.05 are considered non-significant in logistic regression analysis. In this study, however variables with p-values less than 0.1 are significant at 10 percent significance level.

Table 4.12 Consolidated p-values of factors and the categories 2005-2014

Factors & categories	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Market:	**0.646**	**0.646**	0.818	0.998	0.888	0.537	0.386	0.829	0.197	0.438
Export	0.646	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Domestic			0.514	0.998	0.510	0.667	0.686	0.149	0.217	0.199
Subsector:	**0.930**	**0.930**	0.168	0.671	0.968	0.156	0.111	0.103	0.004	0.016
Manufacturing	1.000	0.999	1.000	0.670	0.300	0.149	0.078	0.050	0.013	0.011
Extraction	0.702	0.999						1.000	1.000	1.000
Retailing			0.652	0.286	0.669	0.749	0.150	0.072	0.095	0.016
Product:	**1.000**	**1.000**	0.676	0.847	0.853	0.145	0.332	0.987	0.465	0.526
Raw materials	1.000	0.999	0.999	0.559	0.248	0.089	0.469	0.955	0.667	0.918
Consumables	0.999	0.999	1.000	1.000	1.000	1.000	0.411	0.705	0.713	0.975
Equipment	0.999	0.998	0.999	0.189	0.964	0.360	0.560	0.926	0.893	0.182
Capital size:	**0.898**	**0.989**	0.498	0.739	0.643	0.699	0.890	0.700	0.413	0.059
Large capital	0.999	0.998	0.999	1.000	1.000	1.000	0.805	1.000	0.287	0.059
Medium capital	0.643	0.998	0.880	0.445	0.145	0.918	0.838	0.778	0.215	0.987
Small capital		0.999	0.998	0.415	0.065	0.287	0.907	0.586		
Capital gearing:	**0.999**	**0.999**	0.054	0.810	0.259	0.621	0.779	0.240	0.377	0.026
High	0.958	0.997	0.293	0.574	0.072	0.273	0.984	0.256	0.286	0.008
Moderate	0.999	0.998	1.000	0.999	0.999	0.999	0.999	0.391	0.999	0.190

Note: Significant factors in red colour and significant categories in blue

Table 4.12 reveals that capital gearing factor with p-value of 0.054 and sub-sector factor with p-value of 0.004, show significant impact on EVA in 2007 and 2013

respectively. Table 4.12 shows that manufacturing category of the sub-sector factor was significant in 2011, 2012, 2013 and 2014 with p-values of 0.078 at 10 percent significance level, 0.05, 0.013 and 0.011 respectively. In 2014 significant factors were sub-sector, capital size and capital gearing with p-values of 0.016, 0.059 at 10 percent significance level and 0.026 respectively. However, capital gearing factor was significant in 2007 with p-value of 0.054, but there was no significant category of capital gearing factor in 2007.

The retail category of the sub-sector factor was significant in 2012, 2013 and 2014 with respective p-values of 0.072 at 10 percent significance level, 0.95 at 10 percent significance level and 0.016 (Table 4.12). In 2010, the industrial raw material category of product type factor was significant with p-value of 0.89 at 10 percent significance level. Small capital size category of the operating capital size factor was significant in 2009 with p-value of 0.065 at 10 significance level, while large capital size category of the operating capital size factor was significant in 2014 with p-value of 0.059 at 10 percent significance level. High capital gearing category of the capital gearing factor was significant in 2009 and 2014 with respective p-values of 0.072 at 10 percent significance level and 0.008.

The non-significant factors are market segment factor and product type factor with p-values greater than 0.05 in all the ten years covered in the study, though industrial raw material category of the product type factor was significant in 2010 (Table 4.12). The non-significant factors are those whose changes in volume might not bring about any change in EVA. Further calculation of the coefficients of variables and the subsequent discussions focus on three significant factors together with their respective categories such as manufacturing and retail category for sub-sector factor, large capital category for the capital size factor and highly geared category for capital gearing factor. The reason for focusing discussion on the significant factors is because they are the factors that show to impact on EVA based on this model.

Generally, it could be observed in Table 4.12 that p-values of the factors together with some of the categories are reducing between 2005 and 2014. The reduction in the p-values of the factors and categories indicate movement towards becoming significant in later years.

4.5 ANALYSIS OF SIGNIFICANT FACTORS AND CATEGORIES FOR 2014

As stated in Chapter 3 of this study (Section 3.11), the detailed analysis presented are based on results of the year with the highest number of significant factors. The reason for this decision, as stated in Section 3.11 of this study, is to avoid repetition of explanations in each of the years. The ten-year result presented in Table 4.12 shows that 2014 has the highest number of significant factors and hence results for 2014 are used for the analysis and interpretation of the logistic regression output. Moreover, the analysis of 2014 results relating to significant factors also includes information on other categories that are significant in other years covered in this study.

The outcome of analysis in Table 4.13 for 2014 shows that sub-subsector is significant with p-value of 0.061 at 10 percent significance level. The sub-sector consists of manufacturing with p-value of 0.011 (significant), extraction with p-value 1.000 (non-significant), retail with p-value of 0.016 (significant) and property management (baseline category).

The results shown in Table 4.13 indicate that capital size factor is significant with p-value of 0.059 at 10 percent level of significance. Capital size factor consists of large capital category with p-value of 0.059 at 10 percent level of significance (significant), medium capital size category with p-value of 0.987 (non- significant) and small capital size category (the baseline category).

The result in Table 4.13 reveals that capital gearing is significant factor in the industrial companies' value creation drive. The result shows that capital gearing is significant with p-value of 0.026. The capital gearing factor consists of highly geared category with p-value of 0.008 (significant), moderately geared with p-value of 0.190 (non-significant) and lowly geared (baseline category). This result is supported by Vasile (2013:520) and Bolek *et al.* (2012:3) who suggested that by optimizing company's capital structure (capital gearing), that higher value could be created. Table 4.13 show the variables in the equation for 2014 applied in this analysis.

Table 4.13 Variables in the equation dependent and independent factors used in the logistic regression model for 2014

Factors	Coefficient	Standard error	Wald	Degree of freedom	p-value	Odds ratio
Market			1.652	2	0.438	
M1[Export]	3.034	56841.443	0.000	1	1.000	20.780
M2 [Domestic]	1.428	1.111	1.652	1	0.199	4.170
Sub-sector			7.374	3	**0.061**	
S1 [Manufacturing]	4.140	1.635	6.410	1	**0.011**	62.775
S2 [Extraction]	25.091	40192.969	0.000	1	1.000	788454118631.18
S3 [Retailing]	2.585	1.078	5.749	1	**0.016**	13.262
Product			2.231	3	0.526	
P1 [raw materials]	-0.136	1.318	0.011	1	0.918	0.873
P2 [Consumables]	-0.101	3.274	0.001	1	0.975	0.904
P3 [Equipment]	-1.606	1.203	1.781	1	0.182	0.201
Capital size			5.654	2	**0.059**	
C1[Large]	3.348	1.774	3.561	1	**0.059**	28.449
C2 [Medium]	-0.018	1.100	0.000	1	0.987	0.982
Gearing			7.285	2	**0.026**	
G1 [High]	-4.092	1.538	7.081	1	**0.008**	0.017
G2 [Moderate]	-3.732	2.846	1.720	1	0.190	0.024
Constant	-1.206	1.195	1.020	1	0.313	0.299

4.6 LOGISTIC REGRESSION MODEL FOR COMPANY CHARACTERISTICS

The logistic regression model for company characteristics is given in Formula 4.1. Only the significant factors (company characteristics) identified previously are included in the model.

Formula 4.1

1_n [p(x) ⁄ 1-p(x)] = -1.206 + 4.140x_{11} + 25.091x_{12} + 2.585x_{13} + 3.348x_{21} – 0.018x_{22} – 4.092x_{31} – 3.732x_{32}: where:

-1.206 is the constant

X_{11} is manufacturing

X_{12} is extraction

X_{13} is retailing

X_{21} is large capital size

X_{22} is medium capital size

X_{31} is highly geared

X_{32} moderately geared

The fitted model (Table 4.13 Variables in the equation) has been with the three significant predictor variables of sub-sector, capital size and capital gearing. The fitted model is based on 2014 result, which has the highest number of significant factors and which is used in the analysis as indicated earlier in chapter three (Section 3.11). Moreover, the significant factors in 2014 also incorporate the other two significant factor of gearing in 2007 and sub-sector in 2013 and hence the convenience of having only one formula to illustrate the logistic regression output for this study. Each of the variables have been classified into categories as expressed in Formula 4.1

4.7 EVALUATION OF IMPACT OF COMPANY CHARACTERISTICS ON EVA

A number of factors or company characteristics have been identified in this study as impacting on EVA in 2007, 2013 and mostly, in 2014. The identified significant factors using the logistic regression analysis are the sub-sector factor, operating capital size factor and capital gearing factor. In addition, some categories of the significant factors and including categories of non-significant factors indicated impact on EVA. The

categories that are significant include manufacturing category in 2011, 2012, 2013 and 2014. Other categories that are significant include retailing in 2012, 2013 and 2014 and industrial raw material of the product type factor in 2010. Small capital size category and large capital size category in 2009 and in 2014, as well as high gearing category in 2009 and in 2014.

The odds ratios for the factors that are significant are converted into statistical probabilities to aid interpretation and understanding of results as indicated in Section 3.11 of Chapter 3. Statistical probabilities are obtained by converting the odds ratios to probabilities using the formula *exp (B) ÷ (exp (B) +1)* as suggested by Simon (2013:1-2). Any number closer to 100 percent means a higher probability. These calculations are found in Section 4.7.1 to Section 4.7.3.

Table 4.14 Consolidated odds ratios 2005-2014

Factors	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Export	1.675	0.000	12.678	76616	0.000	0.000	0.000	3.456	2.800	20.780
Domestic			2.614	72890	1.677	.705	.733	3.197	2.945	4.170
Manufacturing	0.672	1711	3.863	0.469	3.987	6.736	7.701	9.615	26.432	**62.774**
Extraction	0.618	0.000						0.000	2251	**78845**
Retailing			1.795	0.302	0.694	0.762	3.417	4.701	4.949	**13.262**
Raw materials	1.559	0.000	24260	2.736	0.205	0.107	0.453	1.061	0.616	0.873
Consumables	0.000	0.000	0.000	0.000	204914	0.000	0.246	0.503	0.429	0.904
Equipment	10285	0.000	43448	5.946	0.959	0.421	0.607	0.925	1.135	0.201
Large capital	44362	0.000	97401	0.073	0.000	710645	0.625	12081	3.169	**28.449**
Medium cap	0.623	0.000	0.764	0.325	5.148	0.899	0.810	1.313	3.420	**0.982**
Small capital		0.000	3323	0.296	8.435	3.009	1.133	1.662		
High gearing	0.940	2493	0.265	1.770	0.265	0.452	0.985	0.430	0.419	**0.017**
Moderate gear	0.000	1804	0.000	13927	226441	139067	986546	0.350	0.000	**0.024**
Constant	2.683	0.998	1.451	6.173	0.429	1.771	0.751	0.349	0.170	0.299

Note: Odds of significant and non-significant factors and categories in red

The respective probabilities and the probable negative or positive impact on EVA by the significant factors have been generated using the odds and the coefficients (Table 4.14 and Table 4.15). Table 4.14 contains the consolidated odds ratios for 2005 to 2014. The odds ratio is applied to explain the degree of impact of the significant company characteristics on EVA. In 2014, the odds ratios for this analysis are 62.774 for manufacturing category, 78845 for extraction category, 13.262 for retail category

and 28.449 for large capital size category. Others are 0.982 for medium capital size category 0.017 for high gearing category and 0.24 for moderate gearing category.

Table 4.15 Consolidated coefficients in variables in the equation table 2005-2014

Factors	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Market										
Export	0.516	0.516	-2.060	-20.361	0.084	0.392	0.535	-0.129	-0.94	3.03
Domestic										1.43
Sub-sector				-0.183	-0.02	-0.54	-0.58	-0.546	-1.20	-0.92
Manufacturing	-0.398	-0.481	-1.157							**4.14**
Extraction	-0.481	-0.481								**25.1**
Retailing										**2.59**
Product			-0.400	-0.083	0.067	0.535	0.339	0.005	0.270	0.09
Raw materials	0.444	0.444								-0.14
Consumables	-41.558	-0.411								-.101
Equipment	20.751	30.751								-1.61
Capital size			-0.540	-0.173	0.206	-0.18	-0.06	0.171	0.399	1.38
Large	19.910	19.910								**3.348**
Medium	-0.473	-0.473								**-.018**
Gearing			1.018	-0.104	0.360	0.343	0.089	0.408	0.337	
High	-0.062	-0.062								**-4.092**
Moderate	-42.461	-42.46								**-3.732**
Constant	0.987	0.987	11.314	63.308	-1.39	-1.27	-0.55	0.943	3.964	-1.21

Note: Coefficients of the categories of factors discussed in red colour

On the other hand, coefficients are used to indicate if impact of the significant company characteristics on EVA is positive or negative. Table 4.15 contains the consolidated coefficients of the variables in the equation table. A positive impact is indicated by positive value while negative impact is shown by a negative value. The coefficients for factors and categories used in this analysis are 4.14 for manufacturing category, 25.1 for extraction category, 2.59 for retail category and 3.348 for large capital size category. Others are -0.18 for medium capital size category, -4.092 for high gearing category and -3.732 for moderate gearing category.

The coefficients (Table 4.15) for manufacturing category, extraction category, retail category and large capital size category are positive. The positive coefficients indicate that these categories have positive relationship with EVA. The coefficients for medium capital size category, high gearing category and moderate gearing category are

negative. This implies that these categories have negative relationship with EVA. The factors with positive coefficients means that any changes in those factors would result in an increase in EVA while those that have negative relationship means that their changes would not result in increase in EVA.

The coefficients have been applied in conjunction with odds ratios in the evaluation and interpretation of the results obtained from the analysis carried out in this study as presented in Section 4.7.1 to Section 4.7.3.

4.7.1 Impact of sub-sector on EVA

The odds for manufacturing (S1) in 2014 (Table 4.14) is 62.774. This implies that manufacturing has 98 percent [(62.774 ÷ 63.774) x100] chance (probability) of impacting on value creation (EVA). Therefore, manufacturing, with positive coefficient of 4.14 has 98 percent chance of increasing EVA, compared to property management (baseline). This result tallies with Gebreselasie (2008:111; 121) who identified manufacturing as contributing significantly to value added in the economy of South Africa.

The odds for mining and extraction in 2014 (Table 4.14) (S2) is 78845418631.184. This means extraction has 99.99 percent [(78845418631.184 ÷ 78845418632.184) x100] chance of increasing EVA with positive coefficient of 25.1 compared to property management (baseline). The result agrees with Kearney (2012:2) who concludes that extraction-related industries are a key driver of the JSE, representing 42 percent of its value.

The odds for retail trade (S3) in 2014 (Table 4.14) is 13.262. This means that retail trade has a 93 percent [(13.262÷14.262) x100] chance of causing an increase in EVA compared to property management (baseline). This is because retail has positive coefficient of 2.59. The result agrees with the reports of the Gauteng Province (2012:23), which confirms that retail business has been contributing significantly to the growth in GDP of South Africa over the years. It could be reasoned that growth in GDP may be contributed by increase in value creation due to activities of the economic units.

The results for manufacturing and retail categories in 2014 show that manufacturing has 98 percent chance of increasing EVA among the industrial companies as compared to property management, while retail trade has 93 percent chance of causing increase in EVA as compared to property management. In addition, extraction has 99.99 percent chance of increasing EVA compared to property management. In conclusion, by comparing their respective coefficients, it could be declared that mining and extraction having the highest coefficient of 25.1 impacts more positively on EVA in the sub-sector category. This is followed by manufacturing with positive coefficient value of 4.14 and, lastly, retail trade with positive coefficient value of 2.59.

4.7.2 Impact of capital size on EVA

The odds for large capital size category in 2014 (Table 4.14) implies that large capital size has a 97 percent [(28.449 ÷ 29.449) x 100] chance of impacting on EVA compared to small capital size (the baseline). The large capital size category with a positive coefficient of 3.348 indicate a positive impact of this category on EVA, all other categories held constant. The result agrees with Wainaina (2008:28), whose study showed that companies with high capital employed reported higher EVA compared to those companies with smaller capital employed.

The odds for medium capital size category in 2014 (Table 4.14) is 0.982. This implies that medium capital size has 49.546 percent [(0.982 ÷ 1.982) x 100] chance of impacting on EVA compared with small capital size (baseline). The medium capital size category with a negative coefficient of -0.018 indicate that a change in this category could have a negative impact on EVA.

In conclusion, results for operating capital size category in 2014 indicate that a change in large capital size could cause positive change in EVA as it has a positive coefficient of 3.348 where as a change in medium capital size could cause a negative change in EVA as it has a negative coefficient of -0.018.

4.7.3 Impact of capital gearing on EVA

Capital gearing describes the relationship between interest-bearing capital of a company and that provided by the owners, usually expressed in percentage.

Furthermore, capital gearing is a ratio of fixed interest capital to total capital of a company. In this study, a ratio of 60 percent debt to 40 percent equity is a highly geared company; a ratio of 40 percent debt to 60 percent equity is moderately geared while ratio of 20 percent debt to 80 percent equity is a lowly geared company.

The odds for high gearing category in 2014 (Table 4.14) is 0.017. This implies that high gearing has 1.67 percent [(0.017÷1.017) x 100] chance of causing a decrease in EVA compared to low gearing (baseline category). This implies that EVA is affected negatively by a highly geared company capital structure. The result reveales that a high gearing ratio has 1.67 percent chance of causing a decrease in EVA compared to lowly geared ratio, as indicated by the negative coefficient of -4.092.

The odds for moderately geared (G2) in 2014 (Table 4.14) is 0.024. This shows that moderate gearing ratio has 2.34 percent [(0.024 ÷ 1.025) x 100] chance of causing a decrease in EVA compared to low gearing ratio (baseline category), as shown by the negative coefficient of -3.732. The result is supported by De Wet and Hall (2004:56) who conclude that EVA is affected by all the factors that sum up to total leverage. The total leverage are fixed costs measured by the degree of operating leverage (DOL), interest on borrowed capital measured using the degree of financial leverage (DFL) and the cost of own capital.

In conclusion, the results for capital gearing in 2014 indicate that a change in high gearing with a higher coefficient of -4.092 would negatively impact on EVA more than a change in moderate gearing with a less coefficient of -3.732.

Other columns found in the variables in the equation table include the standard error and the Wald statistics. These are not applicable in the analysis of data in this study and hence they are not discussed. However, the consolidated standard error and Wald statistics are attached in Appendix 5 and Appendix 6 respectively.

4.8 ANALYSING WEALTH CREATED BY THE INDUSTRIAL COMPANIES

This section analysed wealth creation by industrial companies using the EVA metric. Analysing wealth creation by the companies using EVA is to determine whether wealth

has been created. This section contains the wealth creation analysis using tables, graphs and charts.

4.8.1 Companies that achieved positive/negative EVA

Differing number of companies achieved positive and negative EVA respectively over the ten-year period. The analysis of the industrial companies' EVA performance in terms of number of companies have been presented in Table 4.16. However, the analysis has been summarised using the percentage of companies that achieved positive or negative EVA in relation to total companies that were in operation each year.

Table 4.16 Ten-year company EVA performance summary

Year	Negative EVA	Positive EVA	Total	% Negative EVA	% Positive EVA
2005	10	26	36	28	72
2006	3	34	37	8	92
2007	7	37	44	16	84
2008	11	43	54	20	80
2009	24	31	55	44	56
2010	25	30	55	45	55
2011	24	34	58	41	59
2012	26	33	59	44	56
2013	25	34	59	42	58
2014	27	32	59	46	54

Table 4.16 shows that companies with positive EVA decreased over the years 2005 to 2014. This means the percentage of companies that achieved positive EVA dropped from a peak of 92 percent in 2006 to a low of 54 percent in 2014. It is not clear whether this was due to economic cycle or not, as mentioned in chapter 3 (Section 3.1). The result indicate that EVA and hence, wealth creation dwindled over the ten-year period to 2014.

Chart 4.1 is to demonstrate the changes in the percentage of companies that achieved positive EVA each year and those that achieved EVA negative in relation to companies in operation in each year.

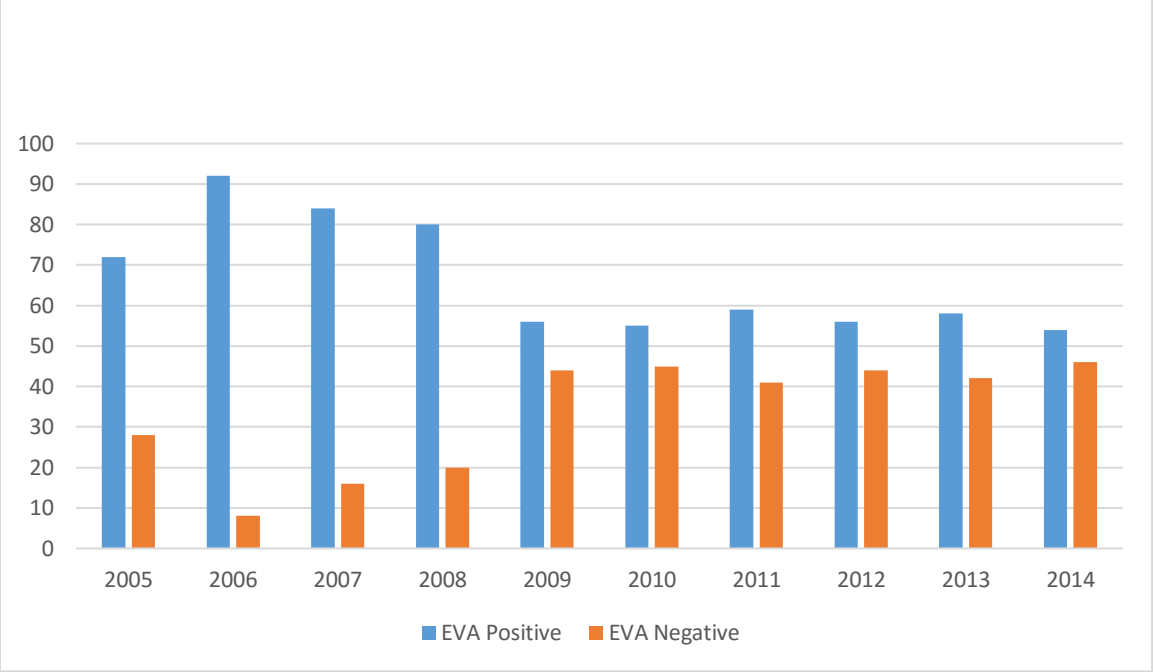

Chart 4.1 Percentage of companies reporting positive and negative EVA

Chart 4.1 shows that the percentage of companies that achieved positive EVA shrank from the period 2006 to 2009, showing a period of global recession as mentioned in chapter three (Section 3.1). It may be argued that the global recession referred to in Section 3.1 impacted negatively on the South African companies through international trading activities so that they achieved negative EVA during the period.

4.8.2 Effects of dwindling number of companies with EVA positive

The effects of the dwindling in the number of companies that achieved positive EVA is shown in Table 4.17. The effects have been a consecutive drop in EVA positive achieved and, hence, a drop in the volume of wealth created by the industrial companies during the ten years covered in this study. In Table 4.17 EVA positive grew from R5.287 billion in 2005 to the peak of R44.204 billion in 2009 and then dropped to R5.650 billion in 2014. Conversely, EVA negative rose from R982.1 million in 2005 to R13.139 billion in 2014. The peak in EVA positive in 2009 could be a result of companies benefiting from the preparation for 2010 World Cup tournament held in South Africa. This is because there were so many construction activities during the period.

Table 4.17 Ten-year summary of EVA positive and negative

Year	Total EVA positive R'000	Total EVA negative R'000
2005	5 286 578.957	982 089.489
2006	7 825 672.591	15 353.980
2007	8 015 426.251	1 825 418.933
2008	9 668 071.126	6 298 527.540
2009	44 204 041.470	10 832 789.667
2010	4 836 664.352	6 632 823.810
2011	6 469 579.070	6 357 224.050
2012	7 406 530.734	8 521 186.280
2013	8 095 144.951	9 216 090.350
2014	5 650 322.150	13 139 344.560
Grand total	107 458 031.652	63 820 848.659

Table 4.17 shows further that a total of R107.458 billion of EVA positive was created over the ten-year period by the industrial companies while achieving a total EVA negative of R63.821 billion. The result means that the industrial companies created wealth to the value of R107.458 billion and at the same time, destroyed value to the tune of R63.821 billion within the ten-year period of the study. Furthermore, Chart 4.2 has been used to show the percentage of wealth created or destroyed by the industrial companies in the ten years covered in this study.

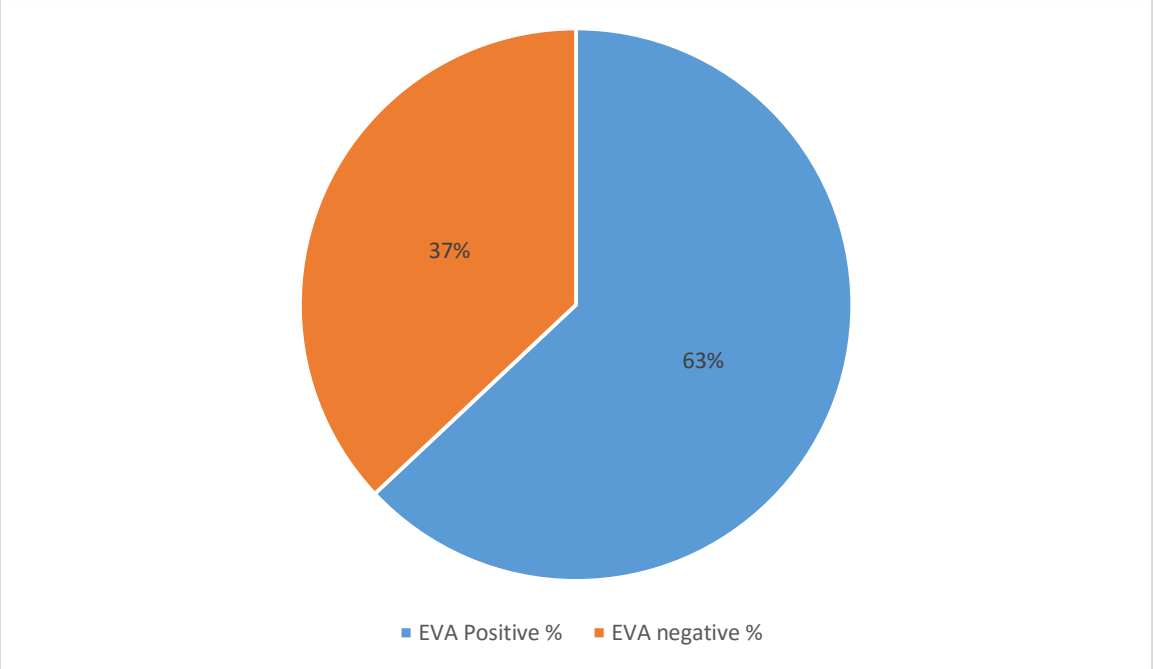

Chart 4.2 EVA performance of the industrial companies 2005-2014

Chart 4.2 shows negative EVA to be 37 percent of the total wealth that should have been created by the industrial companies during the ten-year period, leaving only 63 percent of wealth that was created. Furthermore, Chart 4.3 has been used to show the EVA positive and EVA negative movement over the ten-year period covered in this study. The period 2009 had a spike in wealth creation, probably due to the preparation for the 2010 World Cup event in South Africa. There is also a slowdown in proportion of companies with negative EVA in 2010 due to an increase in economic activities influenced by the 2010 World Cup event. In time series, the spike in 2009 is described as an irregular component.

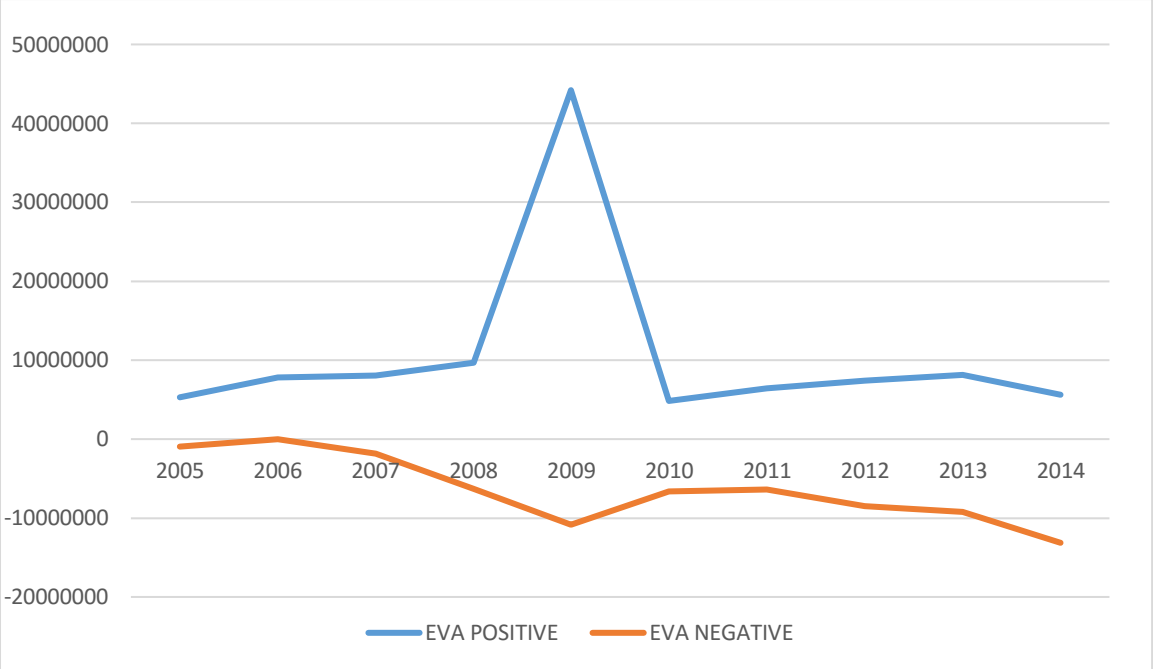

Chart 4.3 EVA positive and negative analysis

Chart 4.3 shows that EVA positive grew to its peak in 2009 and sharply dropped below the EVA negative line in 2010. Chart 4.3 also shows that between 2010 and 2014 that there has been more of EVA negative performance than EVA positive results by the industrial companies during the ten years. This result means that between 2010 and 2014 the industrial companied destroyed more value than they created.

4.8.3 EVA return on economic capital employed (EVACE)

EVA return on capital measures the percentage return achieved by using an amount of economic capital. EVACE was using the total net EVA of the companies and total economic capital of the companies for each year. Table 4.18 shows the relationship between the amount of EVA positive or negative achieved versus the amount of economic capital employed. Table 4.18 reveals positive EVA return on economic capital employed between 2005 and 2009 of 3.3 percent, 4.9 percent, 3.2 percent, 1.4 percent, 14.3 percent and 0.04 percent for 2005, 2006, 2007, 2008, 2009 and 2011 respectively. The negative EVA returns on capital employed are -0.738, -0.338, -0.234 and -1.661 in 2010, 2012, 2013 and 2014 respectively. The result means that the industrial companies achieved negative returns on economic capital employed in 2010, 2012, 2013 and 2014 respectively.

Table 4.18 Annual EVA return on economic capital employed (EVACE) by the industrial companies

Year	Economic capital (R'000)	Net EVA (R'000)	EVACE (%)
2005	131 418 666.000	4 304 489.468	3.2754
2006	158 386 689.000	7 810 318.610	4.9312
2007	195 413 631.000	6 190 007.318	3.1676
2008	248 771 892.770	3 369 543.581	1.3545
2009	234 108 943.100	33 371 251.820	14.2546
2010	513 577.170	-1 796 159.410	-0.7376
2011	277 772 594.210	112 355.020	0.0404
2012	329 998 887.620	-1 114 655.567	-0.3378
2013	399 704 864.300	-1 173 403.019	-0.2936
2014	450 941 510.070	-7 489 022.050	-1.6608

4.8.4 Historical exchange rates, inflation and EVACE compared

As indicated in Chapter 3 (Section 3.5) of this study, EVA return on capital employed (EVACE) has been compared with historical exchange rates and rates of inflation over the same period of ten years covered in this study. The EVA comparison with inflation and exchange rates is presented in Table 4.19.

Table 4.19 shows inflation move from 2.06 percent in 2005 to the peak of 10.04 percent in 2008. Table 4.19 reveals that though inflation dropped from 10.04 percent in 2008 to 4.10 percent 2010, it started and continued to grow until it reached a point of 6.12 percent in 2014.

Data on historical exchange rates as presented in Table 4.19 show that the rand lost value from R5.6356 to the USD in 2005 to R11.5719 to the USD in 2014. This is an approximate loss of 105 percent of the rand to USD over the ten year period. The purpose for the presentation of the historical exchange rates is to see at a glance if changes in exchange rates point to the direction of changes in inflation rates during the same period. That is, if a weakening South African rand against the US dollar reflects a change in the level of inflation during the same period. The rand has been

on an upward trend, except in 2009 and 2010, a phenomenon already described before.

Table 4.19 EVACE, exchange rates and inflation

Year	EVACE %	Exchange rates (rand to dollar)	Inflation rates %
2005	3.2754	5.6356	2.06
2006	4.9312	6.3500	3.24
2007	3.1676	6.7862	6.17
2008	1.3545	9.3035	10.04
2009	14.2546	7.3721	7.26
2010	-0.7376	6.6224	4.10
2011	0.0404	8.0802	5.01
2012	-0.3378	8.4838	5.75
2013	-0.2936	10.4675	5.77
2014	-1.6608	11.5719	6.12

Sources: Inflation.eu (2017); South Africa Reserve Bank (2017)

The return of EVA on economic capital of the industrial companies has been compared with average inflation and historical exchange rates to see at a glance if changes in exchange rate and inflation rate affect EVA performance of companies. The summary of the economic indices of EVACE, historical exchange rates and inflation rates in Table 4.19 has been graphically presented in Chart 4.4.

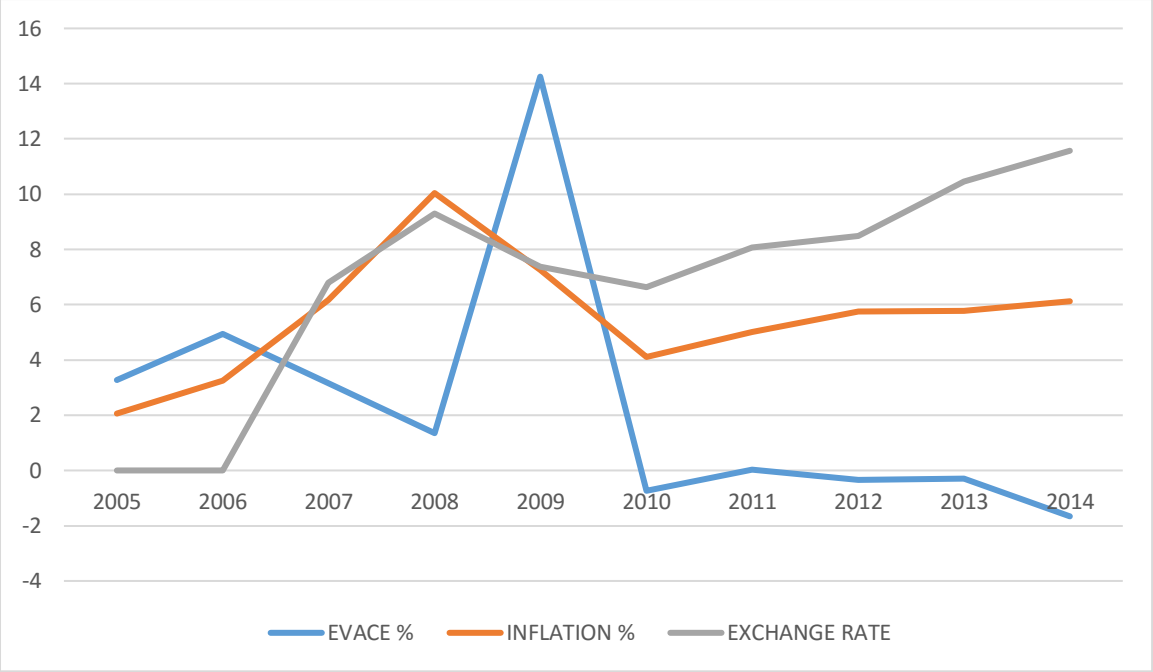

Chart 4.4 Movements in EVACE, inflation and exchange rates

Chart 4.4 shows that as inflation and exchange rates remain relatively low in 2005 and 2006, EVACE was on the rise. However, in 2007 and 2008 inflation and exchange rates began to rise leading to a fall in EVACE. In 2009, inflation and exchange rates dropped causing EVACE to reach its peak in 2009. Chart 4.5 further shows that as inflation and exchange rates rose between 2010 and 2014, so EVACE dropped during the same periods. The graph also shows that inflation follows the rand movement and that if less wealth is created, it is more likely to cause an upward trend in both exchange rate and inflation.

4.8.5 Summary of the net EVA of companies 2005-2014

The yearly EVA performance of the industrial companies have been summarised on sectoral bases in Table 4.20.The summary was calculated by comparing EVA positive and negative achieved by each sector to obtain the net EVA. The information in Table 4.20 is discussed hereunder.

Table 4.20 Net EVA of the companies per sub-sector 2005-2014

Year	Manufacturing	Extraction	Retailing	Property management	Total
2005	1 253 621.195	0	2 463 836.533	587 031.740	4 304 489.468
2006	1 583 847.450	0	4 908 895.040	1 317 576.120	7 810 318.610
2007	1 896 153.09	2 583.231	1 496 217.673	1 477 283.30	6 190 007.318
2008	108 385.036	30 326.850	274 019.055	2 956 812.640	3 369 543.581
2009	-5 451 813.830	17 113.400	35 916 365.21	2 942 044.210	33 423 708.990
2010	581 123.790	-21 527.500	-3 483 713.800	1 127 958.100	-1 796 159.410
2011	1 266 645.170	-18 269.600	1 312 521.590	-2 448 542.140	112 355.020
2012	2 237 688.440	-63 571.700	285 647.393	-3 574 419.700	-1 114 655.567
2013	1 925 531.891	97 938.500	-170 522.090	-3 026 351.320	-1 173 403.019
2014	1 010 201.420	199 746.800	-6 891 346.300	-1 807 623.970	-7 489 022.050
Net EVA	6 411 383.650	244 339.980	36 111 920.30	-448 231.020	43 637 182.940

In 2005, all the sub-sectors returned positive EVA. However, extraction sub-sector did not publish any result on INET-BFA for this analysis. It is evident from the results that retail trade posted the highest amount of positive EVA with R 2.464 billion followed by manufacturing with R1.254 billion and property management with R587 billion. The sub-sectors posted a combined net positive EVA of approximately R4.304 billion in 2005.

The result for 2006 shows that retailing still posted the highest EVA positive with R4 909 billion while manufacturing ranked second in positive EVA performance with R1.584 billion. However, property management ranked third with positive EVA of R1.318 billion, extraction did not publish any result for analysis. Altogether, the companies achieved a total net EVA positive of about R7.810 billion in 2006.

In 2007, manufacturing picked up and ranked the highest EVA performance with R1.896 billion, followed closely by retailing with R1.496 billion. Property management also posted positive EVA with R1.477 billion together with extraction, which achieved a positive EVA of R2.583 million. The result for 2007 shows a total net EVA positive of R6.190 billion, which is lower than the result for 2006.

Results for 2008 show that all the sub-sectors reported positive EVA. The highest positive EVA was achieved by property management sub-sector with R2.957 billion, followed by manufacturing with R108.385 million. The overall result of R3.370 billion

shows a big drop in the performance of all the sub-sectors compared to 2005, 2006 and 2007.

In 2009, manufacturing recorded EVA negative of R5.451 million. In the ten years covered in this study, 2009 is the only year that the manufacturing sub-sector reported EVA negative. However, retail recorded the highest amount of EVA positive in the ten-year period with R35.916 billion followed by property management with R2.942 billion and extraction with R17.113 million. In total, the industrial companies recorded the highest EVA positive of R33.423 billion compared to other years covered in this study.

The property management sub-sector posted the highest EVA positive in 2010 with R1.128 billion followed by manufacturing with R581.123 million. The retail sub-sector recorded a high EVA negative of R3.484 billion while extraction had EVA negative of R21.528 million. The overall result showed a net EVA negative of R1.796 billion achieved by all the companies put together.

The year 2011 was the turn of property management to record EVA negative of R2.449 billion followed by extraction with negative EVA of R18.270 million. However, retailing and manufacturing achieved positive EVA of R1.313 billion and R1.267 billion respectively. The overall result shows a net EVA positive of R112.355 million in 2011.

In 2012, property management recorded a very high EVA negative of R3.574 billion, followed by extraction with R63.571 million EVA negative. Manufacturing achieved EVA positive of R2.238 billion while retailing posted EVA positive of R285.647 million. The overall result for all the companies showed net EVA negative of R1.115 billion.

In 2013, property management again recorded a huge EVA negative of R3.026 billion followed by retail with R170.522 million EVA negative. Manufacturing, however, achieved positive EVA of R1.926 billion and extraction with R97.939 million EVA positive. In all, the companies recorded net EVA negative of R1.273 billion.

In 2014, the industrial companies achieved net EVA negative of R7.489 billion. The negative EVA achievement in 2014 was contributed by retailing with R6.891 billion and property management with R1.808 billion. However, manufacturing achieved positive EVA of R1.010 billion and extraction with R199.746 million.

It is evident from the analysis presented in Table 4.20 that the industrial companies created value during the period covered in this study and also destroyed valued altogether. It is shown in Table 4.20 that retailing created the highest amount of wealth over the ten year period covered in this study, while manufacturing destroyed the least amount of value in 2009 compared to other sub-sectors. Property management consecutively destroyed value between 2011 and 2014 compared to other sub-sectors. Moreover, extraction did not publish any results in 2005 and 2006, hence no record of EVA for the sub-sectors in 2005 and 2006. The retail sub-sector created a net positive EVA of R36.111 billion, followed by manufacturing with R6.411 billion net positive EVA. Extraction sub-sector created EVA positive of the amount of R 244.340 million while the property management sub-sector destroyed value of the amount of R448.231 million in the ten years covered in this study. Overall, the industrial companies created a net EVA positive of approximately R43.637 billion in the ten years covered in this study.

Chart 4.5 has been used to show the percentage contribution of each sub-sector to the amount of wealth created or destroyed by the industrial companies.

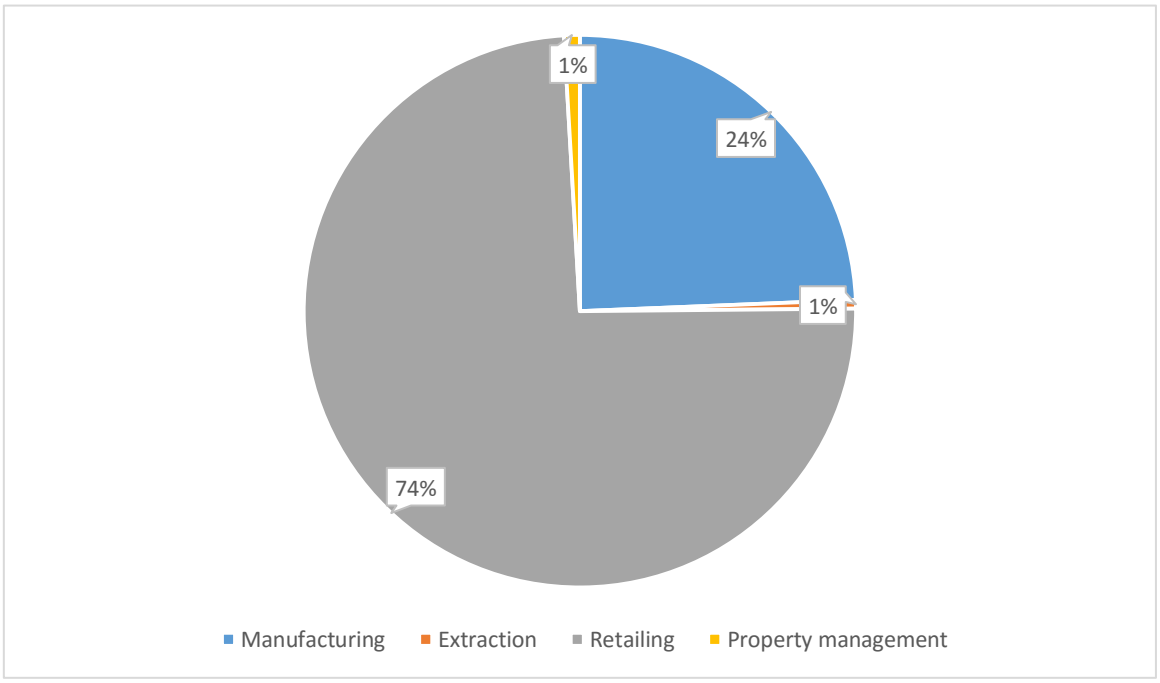

Chart 4.5 Net EVA per sub-sector

Chart 4.5 shows that the retail sub-sector contributed a whopping 74 percent of the total amount of net EVA to the output of the industrial companies in the ten years covered in this study, while manufacturing contributed 24 percent. Furthermore, extraction sub-sector contributed a meagre 1 percent as property management destroyed about 1 percent of what should have been the value created during the period.

4.9 COMPARING EVA RESULTS WITH LOGISTIC REGRESSION RESULTS

Table 4.12 indicate p-values for all factors reducing and moving towards significant levels after 2010. Table 4.16 reveals that the number of companies that achieved negative EVA increased rapidly after 2009, while companies with positive EVA decreased radically during the same period. This means that wealth creation of the companies started to fall after 2009. Table 4.18 shows that EVA return on economic capital employed (EVACE) was highest in 2009 and after that entered negative until 2014. The negative trend may be attributed to the global economic crises already mentioned in the previous chapter. Table 4.19 shows that as inflation started its upward trend in 2011, so exchange rates depreciation escalated correspondingly. Table 4.20 reveals positive EVA dwindling toward 2014. Table 4.20 shows that while manufacturing was still creating value from 2010 to 2014 at a decreasing rate, retail and property management had entered the realm of negative EVA reporting.

Comparison of the outcomes of the regression analysis and EVA performance of the industrial companies as shown in the tables, indicates relationships between wealth creation, inflation and company characteristics. This assertion is arrived at by noting that EVA of the companies started dropping as inflation and exchange rates began to depreciate. In addition, it is observed from the tables that company characteristics began to move towards level of significance during the same period that inflation and exchange rates took a downward trend.

4.10 SUMMARY

The study objective is to determine the company characteristics that impact on value creation by the JSE quoted industrial companies for ten years (2005 – 2014). The analysis considered EVA of the industrial companies as dependent variables and five

company factors of market segment, product types, operating capital size, sub-sector and capital gearing as independent variables.

The EVA performance of the industrial companies was analysed using EVA metric while logistic regression model was applied to determine company characteristics that impact on wealth creation. The outcome of the regression analysis showed that capital gearing factor and sub-sector factor were significant in 2007 and 2013 respectively with the respective p-values of 0.054 at 10 percent level of significance and 0.004. The factors for other years under study have p-values greater than 0.05, therefore, none was considered significant. However, in 2014, three factors have been shown to be significant on EVA performance of the industrial companies.

The logistic regression analysis used to analyse data revealed that manufacturing and retail company categories within the sub-sector factor are significant in causing EVA to change due to change in the volume of manufacturing and retail activities. The analysis also revealed that large capital size is significant within the capital size factor in causing a change in EVA due to a change in the amount of operating capital of the industrial company. It was also shown in the analysis that a further increase in the gearing of highly geared companies within the gearing factor could cause a decrease in EVA. The results show that company product type and the market segment do not have any impact on EVA.

Analysis of wealth created by the industrial companies, using the EVA metric, shows that the industrial companies created value for the shareholders, as more wealth was created than destroyed during the study period. In addition, results of comparisons between EVA, exchange rate and inflation showed there is relationship among these three indices.

Overall, results presented in this chapter indicate that the empirical objectives stated in chapter 1 of this study were achieved.

CHAPTER 5

DISCUSSIONS, RECOMMENDATIONS AND CONCLUSION

5.1 INTRODUCTION

The preceding chapter discussed data analysis and interpretation. Factors that are significant were identified and discussed. The first part of this chapter contains discussions on the findings from the data analysis involving the use of logistic regression analysis. The second part of this chapter contains a discussion on the outcome of the analysis of the EVA performance of the industrial companies as well as the outcome of the comparison of EVA with inflation and exchange rates. The third part of this chapter contains the conclusion, recommendations and suggestions for further studies based on the outcome of this research.

5.2 SUMMARY OF THE RESEARCH

The main objective of the research is to determine the company characteristics that impact on wealth creation by the industrial companies listed under the industrial sector of the JSE for the period 2005 to 2014.

Chapter 1 presented the theoretical and empirical framework guiding the study. The problem statement was discussed and in addition, the theoretical and empirical objectives of the study were formulated.

Chapter 2 provided an overview of the literature about wealth creation, the traditional and the modern measurement metrics. This chapter also provided an analysis of company characteristics in relation to wealth creation.

Chapter 3 presented an in-depth analysis of the research design adopted for this study. The data collection method and data preparations were discussed. The method of data analysis and statistical techniques were outlined.

Chapter 4 dealt with presenting, analysing and interpreting the data collected. A description of the population was done and the results of the logistic regression analysis were presented. This chapter also included an analysis of tests proving suitability of logistic regression model designed for the research. The chapter also

presented results of wealth creation measurement and the comparison of EVA with economic indices of exchange rates and inflation.

5.3 EVALUATION OF THE STUDY OBJECTIVES

The primary objectives of this study have been achieved through achieving the theoretical and the empirical objectives. The extent to which the research objectives have been achieved are discussed hereunder.

5.3.1 Theoretical objectives

The following theoretical objectives formulated for this study and literature reviewed thereon were:

5.3.1.1 The concept of wealth creation

The literature revealed the definition of the concept of wealth creation as discussed in Chapter 2 (Section 2.3). In this study, wealth creation is stated as earning an amount that is greater than the costs of all invested capital for the company to create wealth for the owners (Marshall 1890:244). Unless a company returns more profit than its cost of capital, the company destroys more resources than it creates, therefore, the company does not create wealth but destroys it (Drucker 1995: 7).

5.3.1.2 Evolution of value-based management

In Section 2.3 of Chapter 2, the concept and evolution of VBM was discussed. The origin of VBM dates back to the period of industrial revolution when business operators started to see corporate management as strategic in dealing with matters of efficiency and productivity in organisations (Cunha Pinto & Machado-Santos 2011:71). Alam and Nizamuddin (2012:161) asserted that the origin of value added concepts date back to the 1900s. VBM is described by Cozmiuc and Petrisor (2016:1) as a management system that changes company decisions by focusing on shareholder value. VBM is concerned with making decisions that relate to value or wealth creation (Cunha Pinto & Machado-Santos 2011:71). Maditinos *et al*. (2009:325) reveal that VBM measures of SHV, EVA, EP and CFROI became popular from the late 1980s for incentive compensation management and for making strategic decisions.

5.3.1.3 Business performance measurement

The literature review discussed the concept of performance measurement in Section 2.2 of Chapter 2. Business performance measurement is a system that involves the use of different tools and techniques to collect process and report information regarding the performance of an individual, group or organisation (Okwo and Marire 2012:48). Behn (2003: 586) and Serrat (2010:3) argue that managers could use the tool of performance measurement for budgeting, motivating, controlling, promoting, celebrating achievement, learning and improving on their own efficiency. Furthermore, measuring the outcome of a company's operations could give investors the information they need for evaluation of viability and the financial health of the company (Hamidah 2015:1).

5.3.1.4 Traditional tools for measuring wealth creation

The literature review on traditional performance measures was discussed in Chapter 2, Section 2.8. The traditional tools for measuring wealth creation are such measures that emphasise the size of income, which include share price, earnings, growth in EPS, ROE and return on capital employed (Kaur & Narang 2008:48). These measure do not take into account costs of all capital employed (Panigrahi *et al*., 2014:281). Therefore, any business performance measurement using the traditional techniques would not be adequate to provide shareholders with the information required in assessing the value of their investments (Issham 2013:1758). Khaddafi and Heikal (2014:220) argue that traditional measures of ROE and ROA would not reveal whether a company has created wealth or not as they do not include cost of debt and cost of equity in the calculations.

5.3.1.5 The concept of economic value added

The literature review on the concept of EVA was discussed in Chapter 2 Section 2.3. It is suggested that the concept of EVA followed the idea of Miller and Modigliani (1961:416) to evaluate a business on cash basis (Thilakerathne 2015:118). O'Byrne (1996:116) argued that EVA obtained by subtracting WACC from NOPAT, provides performance and evaluation standards that link theory with practice. EVA, a trademark of Stern Stewart & Co. is described by Stern (2011; 57) as the amount of operating

income that results in economic income after deducting costs of all capital. EVA is said to consider both the economic profits and economic capital before stating if wealth is created or destroyed (Fathabadi *et al*. 2014:206; Sharma and Kumar 2012:805; Bluszcz *et al.* 2015:437).

5.3.1.6 The concept of company characteristics and effect on EVA

The literature on the concept of company characteristics was discussed in Chapter 2 Section 2.7. In this study, company characteristics is defined as attributes, qualities, possessions, relationships and operational activities that differentiate a company from another within the same industry. The concept of company characteristic in this study was borrowed from Porter (1979:215) who states that companies in an industry differ from one another in a number of ways. The observation by Porter (1979:215) gave rise to the discussion on the possible areas of differences that include, but are not limited to, operating capital size, capital gearing, market segments, product types and sub-sector.

5.3.1.7 Exchange rates and inflation and relevance on EVA

The literature (Section 2.7.6 of Chapter 2) reveals a relationship between exchange rates and inflation in Nigeria and Asia (Imimole & Enoma 2011:1; Sek, Ooi & Ismail 2012:1580). Based on the literature, it may be correct to say that exchange rates and inflation may impact on each other in South Africa as well.

The literature review revealed the following:

- That the primary goal of a business is to create wealth for the owners
- That there is a need for a more appropriate technique for measuring wealth creation of companies
- That EVA is suitable for measuring wealth creation as it considers costs of all capital employed, both equity and debt in the calculation
- That they are certain attributes of companies that could impact on its wealth creation ability
- That there is the need to determine company characteristics that impact on wealth creation
- That a relationship exists between exchange rates, inflation and value creation.

5.3.2 Empirical objectives

The primary objectives of the study were successfully achieved through addressing the following empirical objectives:

- Ascertain if company's capital gearing impact on EVA
- Identify if company's size of operating capital impact on EVA
- Determine if company market segments of local and international distributions impact on EVA
- Investigate if product types of industrial and household consumables impact on EVA
- Establish if the sub-sector (manufacturing, extraction, retailing and property management) a company belongs impact on EVA.
- Analysis of the extent of wealth created by the companies using EVA
- Analysis of the relationship of EVA, inflation and exchange rates.

Results of the logistic regression analysis applied in this study reveal in Table 4.12 that three out of the five factors of market segment, operating capital size, product type, sub-sector and capital gearing, impact on EVA in 2007 2013 and 2014. The factors that impact on EVA as obtained from the data analysis are sub-sector, capital gearing and company operating capital size. This finding agrees with Ganea (2014:20) and Vislwanath (2010:36) who suggest that certain company characteristics impact on company value creation. Factors that do not impact on EVA, according to results of this study, are market segment and product types.

The findings discussed hereunder, are disclosed in Table 4.12, while the associated probabilities are disclosed in Section 4.7.1 to Section 4.7.3.

5.3.2.1 Ascertain if company's capital gearing impacts on EVA

Results of the study show capital gearing factor significant in 2007 and 2014. This means that capital gearing factor was significant for 20 percent of the period covered in this study. Though capital gearing factor was not significant in 2009, high gearing category was significant in 2009. High gearing category was found significant in 2014 while moderate and low gearing were not significant. High gearing category was found to have a negative impact on EVA in 2014 compared to low gearing (baseline

category). That means high capital gearing category impacts negatively on value creation for the owners of the company compared to low geared (baseline category). This finding is consistent with Titman and Wessel (1988:17) who found that debt levels are negatively related to company's specific line of business. Based on the conclusion of Titman and Wessel (1988:17) it may be appropriate to say that debt levels in a company's capital structure impact on value creation.

Bolek *et al*. (2012:3), Vasile (2013:520), De Wet and Hall (2014:56) as well as Tunji, Adebayo and Tolulope (2015:77) found that the gearing of a company impacts on earnings. Since EVA is derived from earnings, it would be correct to say that whatever impacts on earnings, invariably impacts on EVA. The level of gearing of a company determines the amount of fixed capital costs that must be paid whether the company makes profits or not. The payment of capital costs usually is made before EVA is ascertained and hence, the higher the capital costs due to high gearing, the lower the EVA performance of the company.

In this study, capital gearing factor has been categorised into high gearing, moderate gearing and low gearing. The negative effect of high capital gearing on EVA could be related to the cost of capital that changes as the capital volume changes. If there is high capital gearing, there is the probability of incurring high capital costs that could lead to a drop in EVA. A company that has high debt capital is obliged to pay high interest that could ultimately reduce the amount of EVA created for shareholders. A company's gearing ratio has an influence on the amount of profits available for the owners of the business. As EVA is derived from profits, a reduction in profit volume of a company has the chance of reducing EVA of the company.

If there is a high debt amount in the structure of a company, the company faces a measure of risk of inability to pay the cost of debt in a period of low productivity. This is because the costs of those debt capital are fixed and must be paid whether the company makes profits or not. Consequently, high gearing indicates a relatively high level of risk inherent to the company. On the other hand, one of the reasons why moderate and low gearing were not significant in terms of EVA could be attributed to the pecking-order theory, which explains that companies that are highly profitable tend to reduce their external financing so that creditors could view such companies to have

low bankruptcy risk (Alkhatib 2012:80). The assertion is also supported by De Wet and Hall (2014:54) who agree that high gearing is related with high EVA volatility, as higher gearing level raises the level of fixed cost, which impacts negatively on EVA, while lower gearing level does not put pressure on EVA, all things being equal.

Shubita and Alsawalhah (2012:109) reveal a negative relationship between debt and profitability, implying that an increase in debt is associated with a decrease in the amount of profits available for the owners of the company. As stated earlier, since EVA is an amount that remains after deducting costs of all capital employed from profit, anything that reduces profit volume would also impact on EVA.

5.3.2.2 Identify if company's size of operating capital impact on EVA

Results of this study indicated that capital size factor was significant in 2014 but not significant in any of the other years covered in the study. The result shows that operating capital size factor was significant for only 10 percent of the time covered in the study. However, capital size factor was not significant in 2009, but small capital size category was found significant in 2009. Capital size here means volume of equity and liabilities at the disposal of companies. Value is created through investment activities. Investment, on the other hand, is made possible only if there is capital at the disposal of the investors. Moreover, the size of investment by any company is a function of the capital size at its disposal (Piana 2001:1). Capital size is categorised into large, medium and small capital sizes. The study shows large capital size to be significant while medium and small capital are not significant. This result indicating significant impact of capital size on EVA agrees with Asimakopoulos, Samitas and Papadogonas (2009:930).

Gaur and Kesava (2007:22) associate high inventory turnover with big companies measured in terms of capital size translating to higher profitability than a company with small capital size does. Similarly, Piana (2001:1), Wainaina (2008:28) and Asimakopoulos *et al*. (2009:930) show a relationship between value creation and the size of a company's capital measured in terms of value of assets employed, which is a function of capital size.

It may be correct to reason that if a company has a considerable amount of capital that the company would be able to invest in the type of technology that could result in optimising its operations. One may also be correct to say that optimising a company's operations through the use of modern technology might result in the level of productivity that might result in optimising value creation. Therefore, it could be concluded that a company's capital size has an impact on the company's value creation drive.

It is apparent that there is no investment if there is no capital at the disposal of the potential investor. Large capital size enables a company to embark on any available profitable venture in order to create value for the owners. In a situation where there is not much capital, a company would not be able to utilise any profitable investment opportunities. The classical definition of capital as wealth that is used in production as well as that in the course of exchange (George 2017) suggests that without capital there would be no production. If there were no production, apparently there would be no value creation. The need for large capital size for investment has been highlighted by the results of this study.

5.3.2.3 Determine if company market segments of local and international distributions impact on EVA

The logistic regression analysis results obtained for this study indicated that local or international market segment was not significant in terms of EVA for the ten years covered in the study. Though market factor did not prove to be significant in any of the ten years covered in this study, the trend in the p-values indicates domestic market to be moving towards significance in terms of EVA between 2012 and 2014. This assertion is based on the p-values, which began to drop from 2012.

Aulakh, Kotabe and Teegen (2000:358) and ITA (2017) suggest that markets where companies sell their goods or services could impact on profitability. It is not clear why the result of this study, in respect of impact of market segment on EVA, is different from those of Aulakh *et al.* (2000:358). Aulakh *et al*. (2000:358) study was on countries whose economies were described as emerging, just as that of South Africa. It may therefore, be asserted that there could be peculiar economic characteristics in these

countries that were different from the economic experience of South Africa and, hence, the difference in the study outcomes.

It may be correct to say that market segment factor is not significant in this study, within the South African environment, according to the study of Musembi (2009:41), who found that industry experience has a positive impact on a company's profitability rather than market development. Musembi (2009:41) conducted the study in the African country of Kenya and, hence, the similar result, as opposed to that of Aulakh *et al*. (2000:358), which was conducted in the Americas. One may reason that profitability results from the difference between input costs and selling price of an item. Input costs, selling price as well as sales volume may not be influenced by market in terms of domestic or international, but rather by the market size. A product might sell more locally and make more returns than if the product is exported and vice- versa.

5.3.2.4 Investigate if product types of industrial and household consumables impact on EVA

Results of this study did not indicate product type factor to be significant in terms of EVA for the ten years covered; however, the industrial raw material category was found significant in 2010. In terms of product quality, Hussein and Gholam (2013:95), Jahanshahi, Gashti, Mirdamadi, Nawaser and Khaksar (2011:253) and BPM Partners (2008:1) conclude that there is a relationship between the product of a company and profitability. Profitability relates to EVA, as EVA is calculated from profit. This study considered product types in terms of household or industrial goods and not quality.

It may, therefore, be appropriate to argue that any product that is found to have a substantial market, be it household or industrial, could create wealth for owners of the company, all things being equal. Results found in the literature enumerated above suggest that what could impact on the ability of a company product to create wealth are production cost and product quality, but not the product type.

5.3.2.5 Establish if the sub-sector to which a company belongs impacts on EVA

The sub-sector to which a company belongs is found to be significant for up 20 percent of the period covered in this study as the sub-sector factor was significant only in 2013 and 2014. Olweny and Shipho (2011:1) and Kearney (2012:2) conclude that a company's sectoral-specific factors, which include but not limited to, capital adequacy, asset quality, liquidity, operational cost efficiency, as well as income diversification, impact on performance. In this study, sub-sector was categorised into manufacturing, mining and extraction, retailing and property management. In addition, Gebreselasie (2008:111; 121) and Gauteng Province (2012:23) conclude that some sub-sectors of the South African economy contribute significantly to growth and development of the economy. Although one may argue that economic growth does not amount to creation of wealth, it should be understood that wealth creation contributes to economic growth. Based on this argument, if according to Gebreselasie (2008:111; 121); Gauteng Province (2012:23), sub-sector contributes to the economic growth of South Africa, then sub-sector could have a positive chance to impact on wealth creation

The sub-sector categories that are found significant are the manufacturing category and retail category, while extraction and property management categories are not significant. The significance of manufacturing and retailing to changes in EVA could be attributed to the characteristic transformation of resources into consumable items through manufacturing and as well bringing such items to the reach of the intended consumers within the economic system through retail trade. The conversion of materials into consumable goods and the eventual delivery to the intended consumers invariably completes an exchange cycle. In this study, exchange cycle is when investments, in the transformation of materials into finished and semi-finished goods and services are realised at a profit through the medium of retail trade in delivering the goods and services so transformed to the consumers profitably.

The manufacturing category was significant for up to 40 percent of the ten-year period covered in the study. This is because the manufacturing category became significant in 2011, 2012, 2013 and 2014. The manufacturing category, also referred to as the real sector, is the sector that combines the production factors of land, labour and

capital to transform material resources into consumable goods. The transformation of materials into consumable goods invariably adds value to such products. The value added on the goods results in value creation to the company, all things being equal. It may be correct to reason that any economy where the manufacturing sector is not operating optimally in producing the goods required by the consumers, that economy would be described as a dependent economy. The reason for this assertion is that the economy would depend on another economy to provide it with consumable products. Consequently, the available land, labour and probably capital, would not be employed towards value creation.

Economic growth, which in this study, is perceived as related to wealth creation, begins when all the resources of land, labour and capital are put into a productive venture (Ross 2015). The manufacturing sector is the sector that commonly utilises these resources to accentuate the creation of value for the company and the society at large (Livesey 2006:1). In South Africa, as well as other parts of the world, manufacturing is the sector, which keeps the engine of the economy running. It could be deduced that the South African economy is experiencing a shift from the primary industry comprising farming, mining and extraction to the tertiary industry, which includes manufacturing. This is due to the high demand for manufactured goods. Consequently, the manufacturing sector contributes immensely to the country's economic growth Gebreselasie (2008:111; 121); Gauteng Province (2012:23)

The extraction factor was not significant in terms of EVA reporting in any of the ten years covered in the study. Kearney (2012:2) concludes that extraction-related industries are significantly driving the JSE; however, according to the result of this study, extraction factor is not significant in relation to EVA. The non-significance of the extraction factor to EVA may be related to the findings of Fedderke and Pirouz (2003:13); Paulo (2015:8) who insinuated that there is a declining importance of gold mining within the South African economy due to changes in the gold mining industry as well as declining commodity prices. It may not be out of place therefore, to argue that non-significance of extraction factor to EVA could be due to the high volatility in the prices of extraction goods. It is often noted that the suppliers in the international market arena fix prices of goods such as gold and crude oil. Discrimination pricing contributes to company's profitability, but extraction goods are mostly priced by

organisations and institutions such as the Organisation of Petroleum Exporting Countries (OPEC), rather than by individual companies. Based on the inability of extraction-related companies to determine prices for their goods and services, their wealth creation potential would depend rather on external market factors rather than by individual company's operational efficiency.

Retail trade was significant for up to 30 percent of the period covered in the study. This is because retail trade became significant in 2012, 2013 and 2014. Gebreselasie (2008:111; 121) and Gauteng Province (2012:23) agree that retail sub-sectors contribute to growth of the economy. Economic growth, as reasoned earlier, could have a relationship with value creation, hence relevant in this comparison. Retailers should not be viewed as merely intermediaries who obtain goods from suppliers and sell to consumers, but rather platforms that create value and deliver to customers as well as to the owners of the business (Sorescu, Frambach, Singh, Rangaswamy & Bridges 2011:5). The retail trade completes the exchange cycle by bringing the goods and services within the reach of the intended consumers. If goods are produced and not made available to the consumers, there is no commerce. Commerce is generally defined as the buying and selling and the distribution of goods and services. It is apparent that where there is no commerce, there would be little or no value creation. The retail activity, therefore, is the integral part of commerce, which enhances value creation for companies and the economy in general. Therefore, manufacturing and retail activities jointly impact significantly on value creation for companies and the entire economy.

Property management is found not significant in this study. Property management produced a net EVA negative in the ten-year period covered in this study. It may not be out of place to insinuate that the nature of property management business makes it not significant in terms of EVA. Generally, property management involves placement of tenants, maintaining and repairing, as well as continuous administration of real property. This, therefore, means that property management deals with a form of fixed assets with fixed prices over a period of time.

5.3.2.6 Analysis of the extent of wealth created by the companies using EVA as a metric

As displayed in Chapter 4 (Section 4.8) of this study, the industrial companies created more value than they destroyed in the ten years covered in the study. It is noted that all the companies achieved positive EVA in some of the years and negative EVA in others. In all, the industrial companies put together achieved more EVA positive than negative.

Retail business created the highest volume of wealth for the shareholders of the industrial companies during the ten years covered in the study. The second largest wealth creation was the manufacturing sub-sector, while the least amount of wealth created was by the extraction sub-sector. However, the property management sub-sector had a net value destruction in the ten years of the study.

5.3.2.7 Analysis of the relationship of EVA, inflation and exchange rates

Results presented in Chapter 4 (Section 4.8) of this study indicated the negative impact of inflation and exchange rates on EVA using EVACE. The results show that as inflation rates increase, exchange rates depreciate. The rising inflation, coupled with exchange rate depreciation, marked a decline in EVA performance of the industrial companies. Winarno (2013:9) and Paul, Tang and Bhatt (2014:1) found that inflation rates exceeding certain levels negatively impact on growth by causing lower growth rates. One of the reasons for the drop in the level of wealth creation due to currency depreciation and rising inflation could be that these economic indices bring about rising production costs and rising consumer prices, leading to a fall in the volume of sales. The fall in the volume of sales due to rising consumer prices means less productivity by the companies and consequently, less value creation for the owners of the companies.

5.4 THE YEARS WITHOUT ANY SIGNIFICANT FACTOR

Results of the study indicating that no factor was significant between 2005 and 2013 except gearing and sub-sector in 2007 and 2013 respectively, tend to reveal that performance of the industrial companies was influenced during the period largely by

external economic factors rather than by factors internal to the companies. The result could be likened to a ship in a stormy ocean. Such a ship would be driven more by the force of the storm rather than the power of its engine.

The smouldering global financial crisis, which gained momentum in 2008, is described as the worst since the great depression of the 1930s (CODESRIA 2017). The impact of the crisis affected the economy of South Africa through the pressure of inflation resulting from the rise in oil and food prices (Viegi 2008). Other impacts of the economic crisis on the economy of South Africa are a stop in international capital flow, resulting in the collapse of share prices and exchange rates (Viegi 2008). Zini (2008) observed that the meltdown caused a decline in agriculture, mining and manufacturing activities, and altogether, impacting heavily on the real economy.

It is equally observed that the world cup tournament hosted in South Africa boosted the economy temporarily as the preparation caused a massive investment in infrastructure, which created mostly temporary jobs (Cherian 2010). However, the economic crisis was found to begin to ease out in January 2014 (Investopedia 2017). Based on the points given in this discussion, it could be concluded that the performance of the industrial companies in the years prior to 2014 was driven by the external factors mentioned, rather than by the internal company characteristics. Consequently, no significant factor was identified during those years until 2014 when such external factors began to decline in influence over company activities.

5.5 EVA PERFORMANCE, INFLATION AND COMPANY CHARACTERISTICS

Section 4.9 reveals that sub-sector p-values started moving towards becoming significant from 2010 to 2014, hence the highest number of significant factors in 2014. Manufacturing became significant from 2011 to 2014 and retail categories from 2012 to 2014. P-value for market started showing signs of becoming significant from 2012. The scenario described above suggest that manufacturing and retail should be focused on to deepen domestic market during inflation. This is because global inflation may not allow any gains from export due to rising operational costs in the international market.

It is observed from results presented in Section 4.9 of this study that certain categories of companies survive more than others during inflation. The results revealed that while manufacturing and the extraction companies were still creating wealth, property management was already reporting losses. This means that investors may put their money in manufacturing companies, as the investment would still generate value during inflation.

The negative EVA by property management indicate that companies with fixed prices may not survive during inflation period. This could be because property rents do not easily change with the changing inflation. As a result, operating costs would tend to increase even when revenue does not and, hence, a possible negative EVA.

Results in Section 4.9 also show negative EVACE during the period of rising inflation of 2011 to 2014. The reason for negative EVACE could be the rising cost of capital associated with inflation. As capital costs increase and without a corresponding increase in the amount of profit generated, EVA return on economic capital would obviously be affected negatively. This assertion could be explained by the falling p-value of capital gearing as inflation began to grow until 2014. The rising inflation could put a strain on high gearing companies due to the rising interest on capital. This suggests that companies should adjust their capital structure during prolonged periods of inflation to cope with rising costs, and then be able to create wealth for owners.

Capital size also began to show signs of becoming significant from 2013 as shown in Section 4.9. Capital size eventually became significant in 2014 as inflation continued its upward trend. Large and medium capital sizes also moved in the direction of showing signs of becoming significant. The movement towards becoming significant by large and medium capital categories suggests that capital size of a company could become important during inflation.

The results of analysis of EVA performance, inflation, exchange rates as well as significant factors of company characteristics suggest a relatively strong positive relationship among them all. This assertion is arrived at by noting that all the indices move in the same direction during the period.

5.6 RECOMMENDATIONS:

The recommendations presented are based on the results shown in Chapter 4 of this study in achieving the research objectives stated in Chapter 1.

5.6.1 Gearing

It is imperative for company managers to plan their gearing ratio at such a level that a company would not be exposed to risk that would cause EVA to fall. To use both debt and equity capital to maximise company profitability, an optimal capital structure (gearing) has to be arranged by company managers. That is, the capital mix of a company should be arranged scientifically at a level where the company's weighted cost of capital (WACC) is lowest. The reason to desire the lowest WACC is that it determines the amount that would be spent as payment to providers of capital. If the capital cost were huge compared to the amount of profits generated, EVA would be minimal. Based on the outcome of this study, it may be suggested that company managers should embark on a strategic plan to adjust their capital structure in the medium to long term period if they wish to optimise company EVA performance.

5.6.2 Capital size

The implication of the significance of capital size in this study is that government should make policies that would make obtaining capital by investors easier and at a lower cost. If the cost of capital is too high, it could discourage borrowing and eventually discourage further investments. A slump in investment activities due to the shortage of capital means that the amount of value creation within the economy would be minimal. If a company has much capital at its disposal that company could plan to go into an expansion program in order to increase its level of operation and hence, EVA. Another implication is that government should create a conducive political and economic atmosphere that could encourage foreign direct investment. Foreign direct investment enhances the flow of capital for investment; a situation that could result in more value creation by the company and the economy as a whole.

5.6.3 Manufacturing

The implication of the result regarding manufacturing is that government should come up with policies that could encourage the growth of the manufacturing sector so that it operates optimally at full capacity. If the manufacturing sector operates at full capacity, then there could be job creation, saving on import costs and a moderation of pressure on the balance of payment situation. Increase in manufacturing activities could also reduce pressure on the country's foreign reserve, as less money would be spent on import financing due to the availability of local substitutes for such goods. In addition, exporting finished goods would attract more volume of foreign currency than primary products. This is in view of the value added to the products through manufacturing. Apparently, manufacturing contributes to economic value creation to both companies and the entire economy as evidenced in the results of this study.

5.6.4 Retailing

Furthermore, government should ensure stability in consumer prices to stimulate consumption. Price stability could be achieved by checking the volatility of consumer price index (CPI). CPI examines the average prices on consumer goods and services such as transportation, food and medical care. CPI is used to assess price changes associated with the cost of living. If prices are high, cost of living would be high and consumption would drop as well. Should there be any drop in consumption due to high prices (inflation); the volume of retail business would equally reduce leading to a fall in the volume of value creation. More so, a fall in retail would result in a drop in manufacturing, all of which would hamper the creation of value by companies and the economy generally. To this end, government should control inflation so that consumption would be high in order to stimulate retail trade to create value for all stakeholders.

5.7 SUMMARY

The objective of this study has been to determine the company characteristics that impact on wealth creation of the industrial companies listed on the JSE. The factors of market segment, operating capital size, capital gearing, sub-sector and product type were categorised and analysed so that logistic regression analysis would be applied

in the data processing. Results indicated capital gearing and sub-sector as significant factors in 2007 and 2013, respectively. The same factors of capital gearing and sub-sector, which were significant in 2007 and 2013 respectively, were also significant in 2014 together with capital size. Consequently, manufacturing, retailing and large capital size were found to have a positive relationship with value creation, while medium capital and gearing have a negative relationship with value creation among industrial companies.

Results further show some of the categories to be significant in some years when the main factors were not significant. These categories are small capital size category in 2009, high capital gearing in 2009, as well as industrial raw material category in 2010. Others are manufacturing category in 2011 and 2012 and retail category in 2012. The significant categories with significant factors include manufacturing category in 2013 and 2014, retail category in 2013 and 2014, large capital size category in 2014 and high gearing category in 2014.

The outcome of this study could be said to have revealed that certain company characteristics could impact on wealth creation. Based on these findings, a conclusion could emerge to suggest the following: high volume of manufacturing and retail activities should be encouraged by economic stakeholders by making capital available for investments and expansion of projects. Furthermore, company managers should endeavour to arrange optimal capital structure for their companies at such a level as to minimise risk as well as costs of capital. Reduction of costs of capital has the potential to increase the amount of value created for business owners. Moreover, researchers and academics should embark on creating appropriate accounting standard on EVA reporting.

5.8 LIMITATIONS AND SUGGESTIONS FOR FURTHER STUDIES

The company characteristics used in this study were limited to five, namely market segment, operating capital size, product types, capital gearing and sub-sector. It is suggested that future studies should increase the number of factors to see if there are other factors that affect EVA besides sub-sector, large capital and high gearing, as revealed in the study.

Another statistical method may be used to see if the result would be the same as obtained in this study. This study made use of logistic regression analysis to determine the impact of company characteristics on EVA. It is suggested that other statistical tools should be used to see if a different result would emerge.

Analysis of EVA relationship with exchange rate and inflation indicates that a relationship exists between these indices. It is suggested that a study be carried out to determine why inflation and exchange rates impact on EVA.

Other suggestions for further study include the use of a qualitative approach with the application of interviews to obtain the opinions of players in the industry. In addition, a future study should focus on individual companies rather than a whole industry as applied in this study. This approach may reveal different results than the result of this study.

This study made use of published secondary data in the analysis. It is recommended that a study, which would make use of data collected from companies be applied. Using companies' specific data in the analysis would explain how individual company characteristics impact of its EVA performance. In addition, a study should be carried out to extend the years beyond 2014 to see if the trend of the significant factors would show any consistency.

This study discussed the impact of each factor and categories on EVA. It is recommended that a future study should be undertaken to determine any relationship among the respective factors on the impact on EVA. This suggested study would determine if one or more factors could be combined to achieve a synergy towards greater levels of wealth creation.

Future study is also suggested that could identify reasons why no factor was found significant in some of the years covered in this study. The suggested study could determine the influence of economic cycles experienced during the ten-year period covered in this study on wealth creation.

This study was limited to industrial companies listed on the JSE. Another study is recommended that would include data on companies listed on the stock market of any other African country to see if a similar result would be obtained.

REFERENCES

ACHIA, T.N.O., WANGOMBE, A. & KHADIOLI, N. 2010. A logistic regression model to identify key determinants of poverty using demographic and health survey data. *European Journal of Social Science*. 13(1):38-45.

AL MAMUN, A. & ABU MANSOR, S. 2012. EVA as superior performance measurement tool. *Modern Economy*, 3(3):310-318.

ALAM, P. & NIZAMUDDIN, M. 2012. Performance measure of shareholders' wealth: an application of economic value added (EVA). *International Journal of Applied Financial Management Perspective,* 1(2):160-166.

ALKHATIB, K. 2012. The determinants of leverage of listed companies. *International Journal of Business and Social Science*, 3(24):78-83.

ARGANDONA, A. 2011. Stakeholder theory and value creation. "*La caixa" Chair of corporate social responsibility and corporate governance, working paper WP-922, IESE Business School, University of Nevada,* May, 2011.

ARKKELIN, D. 2014. Using SPSS to understand research and data analysis. Psychology curricular materials. Book 1. [Online]. Available at: <http://scholar.valpo.edu/psych_oer/1>. Accessed: 12/11/2016.

ASIMAKOPOULOS, I. SAMITAS, A. & PAPADOGONAS, T. 2009. Firm-specific and economy wide determinants of firm profitability: Greek evidence using panel data. *Managerial Finance.* 35(11):930-939.

AULAKH, P.S., KOTABE, M. &, TEEGEN, H. 2000. Export strategies and performance of firms from emerging economies: Evidence from Brazil, Chile, and Mexico. *The Academy of Management Journal*, 43(3):342-361.

AULOVA, R. & FRYDLOVA, M. 2012. EVA and its determinants for selected group of farms: conventional and organic farming*. Agris on-line papers in economics and informatics,* 4(3):3-13.

BALAZOVA, E. & LUPTAKOVA, J. 2016. Application of economic value added index in the performance evaluation of forest enterprise. *Journal of forest sciences,* 62(5):191-197.

BAYAGA, A. 2010. Multinomial logistic regression: usage and application in risk analysis. *Journal of applied quantitative methods*. 5(2):288-297.

BEHN, R.D. 2003. Why measure performance? Different purposes require different measures*. Public administration review*, 63(5):586-606.

BERBER, N., PASULA, M. & RADOSEVIC, M.2012. Economic value added in function of determining incentive compensation system. *Journal of engineering management and competitiveness*, 2(2):81-86.

BERGTOLD, J.S., YEAGER, E.A. & FEATHERSTONE, A. 2011. Sample size and robustness of inferences from logistic regression in the presence of nonlinearity and multicollinearity. Selected paper prepared for presentation at the agricultural & applied economics association's 2011 AAEA & NAREA joint annual meeting, Pittsburgh, Pennsylvania, July 24- 26, 2011. [Online]. Available at: <http://ageconsearch.umn.edu/bitstream/103771/2/Bergtold et al. Logit Bias Paper>. Accessed: 22/12/2016.

BHASIN, M.L. 2013. Economic value added and shareholders' wealth creation: Evidence from a developing country. *International Journal of Finance and Accounting,* 2(4):185-198.

BHASIN, M.L. 2013. Corporate accounting fraud: a case study of Satyam Computers Limited. *Open journal of accounting*, 2:26-38.

BLUSZCZ, A., KIJEWSKA, A. & SOJDA, A. 2015. Economic value added in metallurgy and mining sector in Poland. *Metalurgija,* 54(2):437-440.

BOLEK, M., KACPRZYK, M., & WOLSKI, R. 2012. The relationship between economic value added and cash conversion cycle in companies listed on the WSE. *Financial internet quarterly "e-Finance",* 8(2):1-10.

BOLTON, C. 2009. Logistic regression and its application in credit scoring. [Online]. Available at: < http://repository.up.ac.za/bitstream/handle/2263/27333/dissertation>. Accessed: 10/11/2016.

BOSTAN, I. MATES, D., HLACIUC, E., GROSU, V. IANCU, E. & SOCOLIUC, S. 2010. Implications of the EVA model use in the firm resources' performant allocation plan. *Accounting and management information systems,* 9(1):120-145

BPM Partners. 2008. Profitability analysis & optimization: gaining a competitive edge. White paper. [Online]. Available at: <http://www.bpmpartners.com/documents/WP-ProfitabilityOptimization.pdf>. Accessed: 19/9/2017.

BRIGHAM, E.F. & EHRHARDT, M.C. 2007. *Financial management: revised custom edition.* London: Thompson Learning.

BURESOVA, V. & DVORAKOVA, L. 2014. Enterprises performance management in context of economic development in the beginning of the 21st century*. International journal of economics and statistics,* 2:1-8.

BURKSAITIENE, D. 2009. Measurement of value added creation: economic value added and net present value. *Economics and management*, 14:709-714

BUSINESSDICTIONARY. 2017. [Online]. Available at: <http://www.businessdictionary.com/definition/market.html>. Accessed: 10/4/2017.

BUSINESSFUNDAS 2017. The 4 P's of Marketing – The marketing mix strategies [Online]. Available at: <https://businessfundas.wordpress.com/2011/03/03/the-4-ps-of-marketing-the-marketing-mix-strategies>. Accessed: 5/4/2017.

CACHANOSKY, N. 2009. GDP vs EVA as an economic indicator*. Munich personal research papers in economics archive,* 15262:1-26.

CHANDRASEKARAN, R. & KUMAR R.V. 2012. Application of logistic regression to predict over target baseline of software projects*. International journal of computer applications,* 44(10):1-6.

CHARI, L. 2009. Measuring value enhancement through economic value added: evidence from literature. *Journal of Applied Finance*, 15(9):46-62.

CHERIAN, N.R.K. 2010. FORBES. South Africa and the world cup. [Online]. Available at: <https://www.forbes.com/2010/06/16/world-cup-south-africa-economy-opinions-columnist-nouriel-roubini.html>. Accessed: 4/5/2017.

CHIWAMIT, P., MODELL, S. & YANG, C.L. 2014. The social relevance of management accounting innovations: economic value added and institutional work in the fields of Chinese and Thai state-owned enterprises. *Accounting and business research*, 44(2):144-180.

CHONG, J., FOUNTAINE, D., HER, M., & PHILIPS, M. 2009. EVA: the bubble years, meltdown and beyond. *Journal of asset management,* 10(3):181-191.

CODESRIA. 2012. The global financial and economic crisis and the South: impact and responses. [Online]. Available at :< http://codesria.org/spip.php?article1566>. Accessed: 5/5/2017.

COZMIUC, D.C. &.PETRISOR, I. 2016. Managing Siemens for shareholder value. [Online]. Available at: <http://connection.ebscohost.com/c/articles /110397960/managing-Siemens-shareholder-value>. Accessed: 6/7/2016.

CUNHA PINTO, T. & MACHADO-SANTOS, C. 2011. An analysis of the correlation between EVA ® and MVA ®: The case of a NYSE Euronext Lisbon listed company. *Global Journal of International Business Research,* 4(4):69-79.

DARABAN, M.C.2017. Economic value added – a general review of the concept. Ovidius university annals, economic Sciences Series, 17(1):168-173.

DASH, M.K. 2010. Factors influencing investment decisions of generations in India: an econometric study. *International journal of business, management, economics and Research,* 1(1):15-26.

DE WET, J.H. & HALL, J.H. 2004. The relationship between EVA, MVA and leverage. *Meditari accountancy research,* 12(1):39-59.

DE WET, J.H vH. 2012. Executive compensation and the EVA and MVA performance of South African listed companies. *Southern African business review*, 16(3):57-80.

DIBRA, R. 2016. Corporate governance failure: the case of Enron and Parmalat. *European scientific journal,* 12(1):283-290.

DINU, E.M. & CIORA, C. 2012. Best practices in incentive compensation from the perspective of value- based management. *Amfiteatru economic recommends*, 14(3):273-285.

DICTIONARY.COM. Inflation. [Online]. Available at: <http://www.dictionary. Com/browse/inflation>2017. Accessed: 15/10/2017.

DRUCKER, P.F. 1995. The information executives truly need. Harvard business school publishing. [Online]. Available at: <https://hbr.org/1995/01/the-information-executives-truly-need>. Accessed: 6/07/2016.

DRURY, C. 2015. *Management and cost accounting.* 9th ed. New York: Andrew Ashwin.

DUNBAR, K. 2013. Economic value added (EVA ^{TM}): A thematic bibliography. *Journal of new business ideas and trend,* 11(1):54-66.

DU PLOOY-CILLIERS, F., DAVIS, C. & BEZUIDENHOUT, R. 2015. Research matte

rs. Cape Town: Juta.

FEDDERKE, J., & PIROUZ, F. 2003. The role of mining in the South African economy. [Online]. Available at: <http://pdfs.semanticscholar.org/a675ab28cc 81d2003b4306cfccf240064429be>. Accessed 25/10/2017.

FANG, J. 2013. Why logistic regression analyses are more reliable than multiple regression analyses. *Journal of business and economics*, 4(7):620-633.

FATHABADI, L., FATHI, D. & DAMIRI, M.H. 2014. Examining the relationship between EVA (economic additional value) and ROE (return on equity) and ROA (return of assets) in Cement and Construction Industries in Tehran Stock Exchange Companies*. International journal of academic research in accounting, finance and management sciences, 4*(4):205-209.

FRAKER, G.T. 2006*.* Using economic value added (EVA) to measure and improve bank performance. 2006 Paper Writing Contest RMA – Arizona Chapter. [Online]. Available at: < http://www.rmaaz.org/pictures/measuringbankperformance.pdf >. Accessed: 20/08/2015.

FTSE/RUSSELL. 2017. Industry classification benchmark. [Online]. Available at: <http://www.ftse.com/products/indices/ICB>. Accessed: 23/03/2017.

GANEA, M. 2014. Creating the economic value and the connections between this and the classical indicators of performance. *Audit Financiar,* 12(120):20-26.

GAUR, V. & KESAVAN, S. 2007. The effects of firm size and sales growth rate on inventory turnover performance in the U.S. retail sector [Online]. Available at: <https://www.researchgate.net/publication/226984906_The_Effects_of_Firm_Size_and_Sales_Growth_Rate_on_Inventory_Turnover_Performance_in_the_US_Retail_Sector>. Accessed: 7/04/2017.

GAUTENG PROVINCE. 2012. The retail industry on the rise in South Africa. Quarterly bulletin. April-June 2012. [Online]. Available at:<http://www.treasury.gpg.gov.za/ Documents/QB1%20The%20Retail%20Industry%20on%20the%20Rise>. Accessed: 17/11/2016.

GEBRESELASIE, T.G. 2008. Sectoral elasticity of substitution and returns to scale in South Africa. *South African journal of economics*. 76(2):110-125.

GEETHA, E. & SWAAMINATHAN, T.M. 2015. A study on the factors influencing stock price- a comprehensive study of automobile and information technology industries stocks in India. *International journal of current research and academic review,* 3(3):97-109.

GEORGE, H. 2017. Economics and political economy. [Online]. Available at: <http://www.henrygeorge.org/def2.htm>. Accessed: 5/11/2017.

GODDARD, W. & MELVILLE, S. 2013. *Research methodology. An introduction.* 2nd ed. Cape Town: Juta.

GRANT, C. & OSANLOO, A. 2014. Understanding, selecting, and integrating a theoretical framework in dissertation research: creating the blueprint for your "house". *Administrative issue journal: connecting education, practice and research*. 4(2):12-26.

HAMILTON, J., RAHMAN, S., & LEE, A.C. 2009. EVA: does size matter? *Review of pacific basin financial markets and policies,* 12(2):267-287.

HAMIDAH. 2015. EVA, ROCE, ROE, and EPS as method of assessment of financial performance and its effect on shareholders' wealth: evidence from bank listed at Indonesian Stock Exchange in 2011–2013*. International journal of scientific and research publications,* 5(2):1-7.

HAQUE, S. & FARUQUEE, M. 2013. Impact of fundamental factors on stock price: a case based approach on pharmaceutical companies listed with Dhaka stock Exchange*. International journal of business and management invention*, 2(9):34-41.

HARRISON, J.S. & WICKS, A.C. 2013. Stakeholder theory, value, and firm performance. *Business ethics quarterly,* 23(1):97-124.

HASSANI, M. & PARSADMEHR, N. 2012. The presentation of financial crises forecast pattern (evidence from Tehran Stock Exchange*). International journal of finance and accounting.* 1(6):142-147

HENRYANI, F.F. & KUSUMASTUTI, R. 2013. Analysis of ownership structure effect on economic value added*. International journal of administrative science & organisation,* 20(3):1-6.

HOSMER, D. W. & LEMESHOW, S. 2000. Applied logistic regression. 2nd ed. New York: John Wiley.

HUSSEIN, V.D. & GHOLAM, R.A. 2013. The Relationship between customer loyalty and product brands. *International journal of research in social sciences,* 3(4):95-104.

ICAEW. 2017. Knowledge guide to beta values. [Online]. Available at: http://www.icaew.com/en/library/subject-gateways/financial-markets/knowledge-guide-to-beta-values>. Accessed: 19/03/2017.

IMIMOLE, B. & ENOMA, A. 2011. Exchange rate depreciation and inflation in Nigeria (1986–2008). *Business and economics journal,* 28:1-12.

INFLATION.EU. Worldwide inflation data. 2014. [Online]. Available at: <http://www.inflation.eu/inflation-rates/south-africa/historic-inflation/cpi-inflation-south-africa-2014.aspx>. Accessed: 03/08/2017.

INVESTOPEDIA. 2016. Enron scandal: the fall of a Wall Street darling [Online]. Available at: <http://www.investopedia.com/updates/enron-scandal-summary/>. Accessed: 16/01/2017.

INVESTOPEDIA 2017 (a).What is a 'Sector'? [Online]. Available at: <http://www.investopedia.com/terms/s/sector.asp>. Accessed: 03/04/2017.

INVESTOPEDIA. 2017(b). What is 'Gearing'? [Online]. Available at: <http://www.investopedia.com/terms/g/gearing.asp>. Accessed: 3/04/2017.

INVESTOPEDIA. 2017(c). Business cycle. [Online]. Available at: <http://www.investopedia.com/terms/b/businesscycle.asp. Accessed: 23/03/2017.

INVESTOPEDIA. 2017(d). Market risk premium. [Online]. Available at: <http://www.investopedia.com/terms/m/marketriskpremium.asp>. Accessed: 22/03/2017.

INVESTOPEDIA. 2017(e). When did the real estate bubble burst? [Online]. Available at: <http://www.investopedia.com/ask/answers/100314/when-did-real-estate-bubble-burst.asp>. Accessed: 19/07/2017.

INVESTOPEDIA. 2017(f). How does inflation affect the exchange rate between two nations? [Online]. Available at: http://www.investopedia.com/ask/answers/022415/ how- does-inflation-affect-exchange-rate-between-two-nations.asp. Accessed: 15/10/2017.

INVESTORWORDS (a). 2017. Exchange rate. [Online]. Available at: <http://www.investorwords.com/1806/exchange_rate.html>. Accessed: 15/10/2017.

INVESTORWORDS (b). 2019. Sector [Online]. Available at: <http://www.investorwords.com/4430/sector.html>. Accessed: 02/02/2019.

ISSHAM, I. 2013. Economic value added (EVA) versus traditional tools in predicting corporate performance in Malaysia*. African journal of business management*, 7(18):1757-1764.

INET-BFA. 2016. Financial models: understanding the EVA module. [Online]. Available at: < www.inetbfa.com>. Accessed: 13/11/2016.

INTERNATIONAL TRADE ADMINISTRATION (ITA). 2017. Exporting is good for your bottom line. [Online]. Available at: https://www.trade.gov/cs/factsheet.asp>. Accessed: 7/3/4/2017.

JAHANSHAHI, A.A., GASHTI, M.A.H., MIRDAMADI, S.A. NAWASER, K. & KHAKSAR, S.M.S. 2011. Study the effects of customer service and product quality on customer satisfaction and loyalty. *International journal of humanities and social science*, 1(7):253-260.

JAGONGO, A. & MUTSWENJA, V.S. 2014. A survey of the factors influencing investment decisions: the case of individual investors at the NSE. *International journal of humanities and social sciences,* 4(4):92-102.

JOHANNESBURG STOCK EXCHANGE (JSE). 2017. Secondary market. [Online]. Available at :< https://www.jse.co.za/services/market-data/indices/ftse-jse-africa-index-series/secondary-market>. Accessed: 03/04/2017.

JOHANNESBURG STOCK EXCHANGE (JSE). 2017. Main board. [Online]. Available at: <https://www.jse.co.za/capital/main-board>. Accessed: 03/04/2017.

JOHNSON, H.T. & KAPLAN, R.S. 1987. *The rise and fall of management accounting.* [Online]. Available at: <http://coin.wne.uw.edu.pl/pmodzelewski/ The%20rise%20 and%20fall%20of%20management%20accounting.pdf>. Accessed: 22/06/2015.

JSE ***see*** JOHANNESBURG STOCK EXCHANGE.

JUHASZ, L. 2011. Net present value versus internal rate of return. *Economics and Sociology,* 4(1):46-53.

JUSOH, R., RUDYANTO, A. & HASLIDA, A.H.2012. Performance measurement practices of public sectors in Malaysia. *Journal of Global Strategic Management,* 6(1):43-44.

KADARIYA S. 2012. Factors affecting investor decision making: a case of Nepalese capital market. *Journal of Research in Economics and Internal Finance,* 1(11):16-30.

KAUR, M. & NARANG, S.2008. Economic value added reporting and corporate performance: a study of System Computer Services Ltd. *Journal of Accounting Research*, 11(2):40-52

KEARNEY, L. 2012. Mining and minerals in South Africa. [Online]. Available at: **<**https://www.brandsouthafrica.com/investments immigration/business/economy/ sectors/mining>. Accessed: 28/03/2017.

KHADDAFI, M. & HEIKAL, M. 2014. Financial performance analysis using economic value added in consumption industry in Indonesia Stock Exchange. *American journal of social science,* 3(4):219-226.

KHAN, S., CHOUHAN, V., CHANDRA, B. & GOSWAMI, S. 2012. Measurement of value creation vis-à-vis EVA: Analysis of select BSE companies. *Pacific business review international,* 5(3):114-131.

KHOSRAVI, S., FATHI, Z. & VALINIA S.N. 2014. Investigating the relationship between financial evaluation (economic and market value-added) and dividend yield of the companies listed on Teheran Stock Exchange. *Journal of current research in science,* 2(1):104-109.

KNOWLEDGE EXCHANGE. 2019. Probability, odds and random chance. [Online]. Available at: <https://learn.problemgambling.ca/probability-odds-random-chance>. Accessed: 03/02/2019.

KUMAR, R. 2014*. Research methodology: a step-by-step guide for beginners*. 4th ed. Los Angeles: Sage.

LAING, G. & DUNBAR, K. 2015. . EVA TM, EPS, ROA and ROE as measures of performance in Australian banks: a longitudinal study. *Journal of Applied Management Accounting Research*, 13(1):41-48.

LIVESEY, F. 2006. Defining high value manufacturing. [Online]. Available at: <https://www.ifm.eng.can.ac.uk/uploads/Research/CIG/DefiningHVM> Accessed: 25/09/2017.

LODHI, S. 2014. Factors influencing individual investor behaviour: an empirical study of City of Karachi. Journal of business and management, 16(2):68-76.

MADITINOS, D., SEVIC, Z., & THERIOU, N. 2006. A review of empirical literature on economic value added (EVA) in explaining stock market returns. Which performance measure is more value relevant in the Athens Stock Exchange (ASE)? 5th Annual conference of the Hellenic Finance and Accounting Association, Thessaloniki, 15-16 December, 2006. University of Macedonia.

MADITINOS, D.I., SEVIC, Z. & THRIOU N.G. 2009. Performance measure: traditional accounting measures vs. modern value-based measures. The case of earnings and EVA® in the Athens Stock Exchange (ASE). International journal of economic policy in emerging economics, 2(4):323-334.

MAELAH, R. 2010. Research in management accounting: Malaysian environment. [Online]. Available at: <https://books.google.co.za/books?id=4o0nBwAAQBAJ&pg=PA161&lpg=PA161&dq=obsolete+management++accounting+information&source=bl&ots=rb9zDpa2ps&sig=pkPNpjKsV-k8jp9UdFgEMpm5vqY&hl=en&sa=X&redir_esc=y#v=onepage&q=obsolete%20management%20%20accounting%20information&f=false>. Accessed: 19/08/2015.

MAN, M. & VASILE, E. 2009. Economic value added-Index of companies' internal performance. *Annals of the University of Petrosani, Economics,* 9(2):115-120.

MARSHALL, A.1890. Principles of economics. 8th ed. New York: MacMillan & Company.

MARX, J., DE SWARDT, C., PRETORIUS, M. & ROSSLYN-SMITH, W. 2017. Financial management in Southern Africa. 5th ed. Cape Town. Pearson.

MERRIAM-WEBSTER. 2017. Exchange rate. [Online]. Available at: <https://www.merriam-webster.com/dictionary/exchange%20rate>. Accessed: 15/10/2017.

MIKOŁAJEK-GOCEJNA, M. 2017. Market-based measures of business value creation and value for shareholders. *Financial internet quarterly.* 6:40-56.

MISANKOVA, M. 2016. Business performance, measuring and evaluating. [Online]. Available at: < http://tvp.fek.zcu.cz/cd/2012/PDF_sbornik/108.pdf>. Accessed: 6/07/2016.

MILLER, M.H. & MODIGLIANI, F. 1961. Dividend policy, growth, and the valuation of shares. *The journal of business,* 34(4):411-433.

MILINOVIC, M. 2014. Implementation of residual income concept in measuring company's financial performance. *Journal of accounting and management,* 21-29.

MOGHADAS, H.B.A & SALAMI, E. 2014. Predicting financial distress by use of logistic in firms accepted in Tehran Stock Exchange*. Indian Journal of Fundamental and Applied Life Sciences* 4(1):200-207.

MONEY MATTERS. 2019. Company,meaning definition and characteristics. [Online]. Available at:<https://accountlearning.com/company-meaning-definition-characteristics/>.Accessed: 31/01/2019

MOSAVAI, S.M.K. 2015. Application of economic value added (EVA) in stock return evaluation of accepted oil productions companies in the Tehran Stock Exchange (TSE). *The Caspian Sea Journal,* 9(1):74-80.

MUCHABAIWA, H. 2013. Logistic regression to determine significant factors associated with share price change. [Online]. Available at: <http://uir.unisa.ac.za/bitstream/handle/10500/13229/Final%20Desertation_46265147.pdf?sequence=1>. Accessed: 17/11/2016.

MUSEMBI, K.J. 2009. The relationship between industry experience and profitability of firms in the text books publishing sector in Kenya. [Online]. Available at: <http://erepository.uonbi.ac.ke/bitstream/handle/11295/96925/Kimanga_The%20relationship%20between%20industry%20experience%20and%20profitability%20of%20firms%20in%20the%20text%20books%20publishing%20sector%20in%20Kenya.pdf?sequence=1&isAllowed=y>. Accessed: 23/09/2016.

NAKHAEI, H., ABDUL HAMID, N.I.N. & ANUAR, M. 2013. Evaluation of company performance with accounting and economic criteria in Bursa Malaysia. *Journal of global business and economics,* 6(1):49-62.

O'BYRNE, F. 1996. EVA and market value. *Journal of Applied Corporate Finance*, 9(1):116-185.

OHARA, K. 2009. Importance of economic value added (EVA) in Japan. Graduate independent final report. Ritsumeikan Asian pacific University, School of Management. [Online]. Available at: <http://rcube.ritsumei.ac.jp/bitstream/10367/2625/1/OHARA%20Katsuya.pdf>. Accessed: 18/7/2016.

OKWO, I. & MARIRE, I. M. 2012. Performance measurement in business organisations: an empirical analysis of the financial performance of some breweries in Nigeria. *Research journal of finance and accounting*, 3(11):48-57.

OLWENY, T. & SHIPHO, T.M. 2011. Effects of banking sectoral factors on the profitability of commercial banks in Kenya. *Economics and Finance Review,* 1(5):1-30.

ONGERI, B.O. 2014. Economic value added-accounting value nexus: the effects of accounting measures on economic value added amongst the Kenyan commercial banks. *Global journal of contemporary research in accounting, auditing and business ethics,* 1(3):182-200.

OSBORNE, J.W. 2006. Bringing balance and technical accuracy to reporting odds ratios and the results of logistic regression analyses. *Practical assessment, research & evaluation*, 11(7):1-6.

OWLGEN 2019. Define a company. Explain its characteristics. [Online]. Available at: <https://www.owlgen.com/question/define-a-company-explain-its-characteristics>.Accessed: 31/01/2019.

OYEDOKUN, A.J., REMI, A.J. & TAIWO, O.J. 2011. Elusive factors influencing share values: empirical assessment. *Australian journal of business and management research*, 1(5):104-111.

PANAHI, B., PREECE, C.N., ZAKARIA, N., & ROGERS, J. 2014. The correlation of EVA and MVA with stock price of companies in the Teheran stock Market. *International Journal of contemporary research in business*, 6(2):291-308.

PANIGRAHI, S.K, ZAINUDDIN, Y. & AZIZAN, A. 2014. Comparing traditional and economic performance measures for creating shareholder's value: a perspective from Malaysia. *International journal of academic research in accounting, finance and Management Sciences,* 4(4):280-289.

PANTEA, M.I., MUNTEANU, V., GLIGOR, D. & SOPOIAN, D. 2008. The managerial performance evaluation through the economic value added. *European research studies,* 11(4):83-100.

PARAGH, A. 2012. Bachelor Thesis: Economic value added and its effects on managerial behaviour- an investigation into the effectiveness of an economic value added compensation system. Erasmus School of Economics, Erasmus University, Rotterdam. [Online]. Available at: <https://www.google.com/search?rct=j&q=PARAGH%2C%20A.%202012.%20Bachelor%20Thesis%3A%20Economic%20Value%20Added%20and%20its%20Effects%20on%20managerial%20Behaviour-%20An%20investigation%20into%20the%20effectiveness%20of%20an%20economic%20value%20added%20compensation%20system.%20Erasmus%20school%20of%20economics%2C%20Erasmus%20University>. Accessed: 6/07/2016.

PARK, A. 2013. An introduction to logistic regression: from basic concepts to interpretation with particular attention to nursing domain*. Journal of Korean academy of nursing*. 43(2):154-164.

PAUL, M.T., TANG, Y.P. & BHATT, M. 2014. A study of the relationship between inflation and exchange rates in the Fiji Islands: a co-integration and vector error approach. *Journal of Developing Areas*, 48(4):1-20.

PAULO, S. 2015. The contribution of the mining sector to socioeconomic and human development. [Online]. Available at: <https://ec.europa.eu/growth/tools-databases/eip-raw-materials/sites/rawmaterials/files/1%20-%20Paulo%20de%20Sa%20WB>. Accessed: 27/06/2017.

PENG, C.J., LEE, K.L. & INGERSOLL, G.M. 2002. An introduction to logistic regression analysis and reporting. *Journal of Educational Research*: 96(1):3-14.

PHILIPS, D.M. 2007. The value of economic reality: applying economic value added. [Online]. Available at: <http://digitalcommons.liberty.edu/cgi/viewcontent.cgi?article=1008&context=honours>. Accessed: 21/07/2015.

PIANA, V. 2001. Investment. Economics web institute. [Online]. Available at: <http://economicswebinstitute.org/glossary/invest.htm>. Accessed: 27/03/2017.

PIMCO. 2017. Inflation and its Impact on Investments. [Online]. Available at: http://www.pimcoetfs.com/SiteCollectionDocuments/BAS087-Inflation.pdf. Accessed: 15/10/2017.

PORTER, M.E. 1979. The structure within industries and companies' performance. *The review of economics and statistics.* 61(2):214-227.

RAGO, M. 2008. An analysis of economic value added. [Online]. Available at: <http://digitalcommons.liberty.edu/cgi/viewcontent.cgi?article=1031&context=honors>. Accessed: 19/08/2015.

RAJASEKAR, S., PHILOMINATHAN, P., & CHINNATHAMBI, V. 2013. Research methodology. [Online]. Available at: <http://arvix.org/abs/physics/0601009v3> Accessed: 18/11/2015.

RAY, S .2012. Efficacy of economic value added concept in business performance measurement. Advances in information technology and management (AITM). *World science publisher, United States,* 2(2):260-267

REDDY, N. R. V. R. RAJESH, M. & REDDY, T.N. 2011. Valuation through EVA and Traditional Measures: an empirical study*. International journal of trade, economics and finance,* 2(1):19-23.

REDDY, N.R.V.R. 2013. Identify the superior measure among the traditional and Modern measures by establishing relationship with stock market returns-a study on select cement companies in India*. Indian journal of research*, 2(2):179-180.

RISTIC, Z. & BABALAN, N. 2006. Performance evaluation and measurement of the organization in strategic analysis and control: methodological aspects. *Management information systems.* 1:36-44.

ROSS, S. 2015. Why are the factors of production important to economic growth? [Online]. Available at: <www.Investopedia.com/ask/answers/040715/why-are-factors-production-important-economic-growth.asp>. Accessed: 25/09/2017.

SEK, S.K., OOI, C.P., & ISMAIL, M.T. 2012. Investigating the relationship between exchange rate and inflation targeting. *Applied Mathematical Sciences*, 6(32):1571-1583.

SERRAT, O. 2010. The perils of performance measurement. Asian development bank. [Online]. Available on: <www.businessofgovernment.org/pdfs/behnreport2. *pdf*>. Accessed: 23/08/2016

SHAH, R., HALDAR, A. & RAO, S.V.D.N. 2015. Economic value added: corporate performance measurement tool. *Corporate Board: Role, Duties & Composition,* 11(1):46-58.

SHARIF, T., PUROHIT, H. & PILLAI, R. 2015. Analysis of factors affecting share prices: the case of Bahrain Stock Exchange. *International journal of economics and finance,* 7(3):207-216.

SHARMA, A. K. & KUMAR, S. 2010. Economic value added (EVA) - literature review and relevant Issues. *International journal of economics and finance* 2(2):200-220.

SHARMA, A.K. & KUMAR, S. 2012. EVA versus conventional performance measures- empirical evidence from India. *Proceedings of American society of business and behavioural sciences annual conference, Las Vegas,* 19(1):804-815.

SHIL, N.C.2009. Performance measures: An application of economic value added. *International journal of business and management,* 4(3):169-174

SHUBITA, M.F. & ALSAWALHAH, J.M. 2012. The relationship between capital structure and profitability. *International journal of business and social science*, 3(16):104-122.

SIMON, S. 2013. P.Mean: calculating predicted probabilities from a logistic regression model. [Online]. Available at: < http://www.pmean.com/13/predicted.html>. Accessed: 29/03/2017.

SIS INTERNATIONAL RESEARCH. 2019. What is quantitative research. [Online]. Available on: <https://www.sisinternational.com/what-is-quatitative-research/>. Accessed: 01/02/2019.

SLOOF, R. & VAN PRAAG, M. 2015. Testing for distortions in performance measures: an application to residual income-based measures like economic value added. *Journal of Economics & Management Strategy,* 24(1):74-91.

SORAL, G. & BHANAWAT, S. 2009. Shareholder value creation in the Indian banking industry: an EVA analysis. *The Journal of Accounting Research & Audit Practices*, 8(3/4):52-60.

SORESCU, A., FRAMBACH, R.T., SINGH, J., RANGASWAMY, A. & BRIDGES, C. 2011. Innovations in retail business model. *Journal of retailing*, 87(1):3-16.

SOUTH AFRICA RESERVE BANK. Selected historical rates. [Online]. Available at: <https://www.resbank.co.za/Research/Rates/Pages/SelectedHistoricalExchangeAndInterestRates.aspx>. Accessed: 06/08/2017

S&P GLOBAL. 2017. We are S&P Global. [Online]. Available at: <https://www.spglobal. com/who-we-are/our-company>. Accessed: 19/07/2017.
SRINIVASAN, G.P., VEERAKUMAR, K. & BALACHANDRAN, S. 2012. Economic value added and market value added of private steel companies. Research journal of social science & management, 2(8):1-7.
STATISTICS SOLUTIONS. 2017. Assumptions of logistic regression. [Online]. Available on :< https://www.statisticssolutions.com/assumptions-of-logistic-regression.>. Accessed: 27/03/2017.
STERN, E. 2011. China adopts EVA: An essential step in the great leap forward. Journal of applied corporate finance, 23(1):56-62.

STEWART, B. 2015. Introduction to EVA and EVA dimensions. [Online]. Available at: <http://pub.evadimensions.com/cpiexpress/doc/introduction%20to%20EVA%20and%20Dimensions%20V1>. Accessed: 30/11/2016

SUTTLE, R. 2017. The importance of industry structure for the determination of a firm's profitability. [Online]. Available at: <http://smallbusiness.chron.com/importance-industry-structure-determination-firms-profitability-33862.htm>. Accessed: 18/03/2017

TABARA, M. 2010. Financial valuation of business. A new approach. *EuroEconomica,* 2(25):96-104.

THILAKERATHNE, P.M.C. 2015. Economic value added (EVA) disclosure practices of Sri Lankan listed companies. *Journal of finance and accounting*, 3(5):117-127.

TIAN, X., ZHANG, T. & RENSEL, A. 2014. An analysis of the discrepancies between EVA and net profit: A study with reference to GEM listed companies. J*ournal of accounting research & audit practices,* 13(2):20- 26.

TITMAN, S. & WESSELS, R. 1988. The Determinants of capital structure choice. *The journal of finance*, 43(1):1-19.

TRAN, M. 2002. WorldCom accounting scandal. [Online]. Available at: <https://www.theguardian.com/business/2002/aug/09/corporatefraud.worldcom2>. Accessed: 16/01/2017.

TUNJI, S.T., ADEBAYO, O.S. & TOLULOPE, O.O. 2015. Impact of gearing on performance of companies. *Arabian journal of business and management review,* 3(1):68-80.

UPADHIYAY, A., BANDYOPADHYAY, G. & DUTTA, A. 2012. Forecasting stock performance in Indian stock market using multinomial logistic regression. *Journal of business studies quarterly,* 3(3):16-39.

VAN DER POLL, H.M., BOOYSE, N.J, PIENAAR, A.J. BUCHNER, S. & FOOT, J. 2011. An overview of the implementation of economic value added (EVA™) performance measures in South Africa*. Southern African business review,* 15(3):124-130.

VASILE, B. 2016. Economic value added and stakeholders' interests. *Annals of faculty of economics.* 1(2):512-522.

VASILESCU, L. & POPA, A. 2011. Economic value added: pros and cons. *Finance-challenges of the future,* 1(13):60-65.

VIDRASCU, P.A. 2015. Intangible assets - sustainable economic factors and new creators of value. *Internal auditing & risk management,* 1(37):65-75

VIEGI, N. 2008. Impact of the financial crisis in South Africa. [Online]. Available at: <https://www.ids.ac.uk/files/dmfile/southafricanicolaviegi>. Accessed: 5/5/2017.

VISALTANACHOTI, N., LUO, R. & YI, Y. 2008. Economic value added (EVA) and sector returns. *Asian academy of management journal of accounting and finance,* 4(2):21-41.

VISLWANATH, S.R. 2010. EVA financial management at Godrej Consumer Products Ltd. *Asian case research journal*, 14(1):31-61.

WAINAINA, G.J 2008. Economic value added (EVA) and market returns. The case of companies quoted on the Nairobi Stock Exchange. A management research project submitted in partial fulfilment of the requirements for the degree of Master of Business (MBA), University of Nairobi. [Online]. Available at: http://erepository.uonbi.ac.ke/bitstream/handle/11295/7863/Gikinyo_Economic%20value%20added%20(eva)%20and%20market%20returns.pdf?sequence=5>. Accessed: 6/07/2016.

WAWERU, N.M. 2010. The origin and evolution of management accounting: a review of the theoretical framework. *Problems and perspective in management,* 8(3):166-182.

WELDON, S.G. 2013. The relationship between economic value added and future accounting earnings: a study of South African listed companies. ACC001. Proceedings of the 2013 SAAA biennial conference. 8-31.

WINARNO, T. 2013. The dynamics relationship between inflation and economic growth in Indonesia: a regional thresholds approach. *Journal of economic literature of the American economic association, 1-9.*

WURTZ, K & GAMBOA, B. 2014. Using logistic regression: a case study. [Online]. Available at: <http://www.craftonhills.edu/~/media/Files/SBCCD/CHC/About CHC/Research and Planning/Presentations/Using_Logistic_Regression>. Accessed: 20/04/2017.

Zini, M. 2008. The impact of the financial crisis on South Africa. Africa can end poverty. [Online]. Available at: < http://blogs.worldbank.org/africacan/the-impact-of-the-financial-crisis-on-south-africa>. Accessed: 05/03/2017

APPENDIX 1: GLOBAL SPREAD OF STUDY ON EVA (2008-2015)

S/N	Date	Author(s)	Methodology	Content	Contribution to research	Country
2	2008	Visaltanachoti & Yi	Empirical	B	Relationship between EVA & Stock returns	Australia
8	2008	Kaur & Narang	Empirical	C	Highlights on EVA & shareholder value creation	India
9	2008	Wainaina GJ	Empirical	B	Relationship between EVA & Stock returns	Kenya
10	2009	Man & Vasile	Empirical	C	EVA relevance in quantifying firm performance	Romania
11	2009	Cachanosky N.	Descriptive	H	Measuring GDP with EVA metrics	Argentina
12	2009	Chari L.	Empirical	C	Highlights on using EVA to motivate performance	India
16	2009	Burksaitiene D.	Empirical	F	Comparing EVA with capital budgeting tools	Lithuania
17	2009	Chong *et al*.	Empirical	E	Portfolio management using EVA metrics	USA
18	2009	Hamilton *et al*.	Empirical	I	Reviewing impact of firm size on EVA result	USA
21	2010	Bostan *et al*.	Descriptive	F	Applying EVA in allocating firm resources	Romania

S/N	Date	Author(s)	Methodology	Content	Contribution to research	Country
23	2010	Oberholzer & Westhuizen	Empirical	C	Estimating efficiency & value creation in banks	South Africa
25	2010	Sharma & Kumar	Empirical	J	Display of research contributions on EVA	India
26	2010	Tabara	Descriptive	C	EVA as a tool to stimulate operational efficiency	UK.
27	2010	Vislwanath SR	Empirical	C	EVA as a tool to stimulate operational efficiency	India
29	2011	Issham I.	Exploratory	C	Using EVA to measure company performance	Malaysia
30	2011	Pinto & Machado	Empirical	A	Empirical analysis of EVA-MVA relationship	Portugal
31	2011	Vasilescu L.	Descriptive	C	Emphasis on the merits & shortcomings of EVA	Craiova
34	2011	Stern E.	Empirical	C	Benefits of EVA on Chinese economy	China
35	2012	Alam & Nizamuddin	Theoretical	C	Explanation of EVA theoretical foundation	India

36	2012	Khan *et al*.	Empirical	A	Influence of profitability & sales growth on EVA	India
37	2012	Srinivasan *et al*.	Empirical	A	Measuring economic profit	India
38	2012	Alexei S.	Empirical	A	EVA evaluation at different company levels	Romania
39	2012	Bolek *et al*.	Empirical	C	Linking EVA with cash conversion cycle	Warsaw
40	2012	Sharma & Kumar	Empirical	C	The use of EVA result in investment decisions	Malaysia
41	2012	De Wet	Empirical	D	Role of EVA in incentive planning	South Africa
42	2012	Paragh A.	Empirical	D	EVA effect on managerial behaviour	Rotterdam
43	2012	Ray S.	Empirical	A	EVA measurement as efficiency motivator	India
44	2012	Al Mamun& Abu Mansor	Empirical	C	Enhancing knowledge of EVA application in the firm	Malaysia
45	2012	Aulova & Frydlova	Empirical	L	Revealing relationship of EBIT, WACC & EVA	Czech Rep.
46	2013	Reddy NRVR.	Empirical	B	EVA & stock market returns	India

47	2013	Henryani & Kusumastuti	Empirical	M	Effects of ownership structure on EVA	Indonesia
48	2013	Dunbar K.	Survey	J	Insight into uses & application of EVA from studies	Australia
49	2013	Issham I.	Exploratory	B	EVA in predicting stock returns	Malaysia
50	2013	Nakhaei *et al*.	Empirical	B	EVA versus other tools in explaining stock returns	Malaysia
53	2014	Khaddafi *et al*.	Empirical	C	EVA & financial performance measure	Indonesia
54	2014	Khosravi *et al*.	Descriptive	A	Relating EVA with MVA and Dividend yield	Iran
55	2014	Chiwamit *et al*.	Survey	C	Relevance of EVA in SOEs	China& Thai
57	2014	Tian *et al*.	Descriptive	C	Relating EVA with accounting profits	China
58	2014	Buresova & Dvorakova	Mapping	H	Use of EVA in enterprise for economic development	Czech Rep.
60	2015	Shah *et al*.	Empirical	A	Relating EVA with MVA & employee motivation	India
61	2015	Thilakerathne PMC	Exploratory	A	Motivation for EVA reporting in firm financials	Sri Lanka

62	2015	Ganea M.	Empirical	L	Identifying EVA factors	Romania
63	2015	Sloof & Praag	Empirical	C	Investigating "Gaming & Distortions" in EVA	Denmark
66	2016	Ohara, K.	Empirical	C	Validity of EVA metric in Japan	Japan

Source: Papers reviewed for the study. **Content: S/N-**Serial number**; a**-EVA/MVA; **b**-EVA/Stock returns; c-EVA validity; **d**-EVA-incentive; **e**-EVA/portfolio selection; **f**-EVA/capital budgeting; **g**-EVA critiques; **h**-EVA/economic development; **i**-EVA/firm size; **j**-Review of article; **k**-EVA/e-marketing; **l**-EVA determinants; **m**-EVA/ownership structure.

APPENDIX 2: EVA AND ECONOMIC CAPITAL OF COMPANIES FOR 2014

S/N	Company code	YR	EVA coding	Eco capital (R'000)
1	ADR	2014	1	3,494,815.00
2	AFT	2014	1	1,116,312.00
3	AEL	2014	1	9,259,000.00
4	AER	2014	1	266,196.00
5	ARH	2014	1	912,235.00
6	ART	2014	0	1,448,610.00
7	APK	2014	0	1,633,894.00
8	AEG	2014	0	17,047,000.00
9	BAW	2014	0	21,881,000.00
10	BSR	2014	0	1,625,299.00
11	BEL	2014	0	2,908,004.00
12	BCF	2014	1	475,504.00
13	CAC	2014	1	137,934.43

S/N	Company code	YR	EVA coding	Eco capital (R'000)
14	CGR	2014	1	904,198.00
15	CRG	2014	0	659,657.00
16	CIL	2014	0	3,023,092.00
17	DAW	2014	0	2,589,451.00
18	ELR	2014	1	1,206,215.00
19	ELI	2014	0	1,562,330.00
20	ENX	2014	0	392,802.00
21	EQS	2014	0	11,427,000.00
22	ESR	2014	0	1,057,619.00
23	GND	2014	0	30,227,649.00
24	GRF	2014	1	3,738,939.00
25	HWN	2014	1	938,736.00
26	HDC	2014	0	2,165,746.00
27	IPL	2014	1	39,272,000.00

S/N	Company code	YR	EVA coding	Eco capital (R'000)
28	IWE	2014	1	757,430.00
29	IVT	2014	1	10,973,096.00
30	KAP	2014	1	11,090,000.00
31	KDV	2014	1	240,017.00
32	MMP	2014	0	1,574,813.26
33	MDI	2014	1	1,628,102.74
34	MZR	2014	0	310,244.00
35	MFL	2014	1	709,129.00
36	MMG	2014	1	523,595.00
37	MIX	2014	0	1,705,463.00
38	MPT	2014	1	5,135,800.00
39	MUR	2014	1	9,861,300.00
40	NPK	2014	1	17,196,000.00
41	NTI	2014	0	5,756,783.63

S/N	Company code	YR	EVA coding	Eco capital (R'000)
42	OLG	2014	1	666,266.00
43	PPC	2014	1	8,925,000.00
44	PMV	2014	1	119,814.00
45	RBX	2014	0	3,993,273.00
46	REM	2014	0	74,171,000.00
47	RLO	2014	0	7,351,800.00
48	SNV	2014	1	444,858.00
49	SEP	2014	0	1,034,425.00
50	SOH	2014	0	833,434.00
51	SSK	2014	0	2,879,478.00
52	SPG	2014	1	8,068,829.00
53	BVT	2014	1	52,843,134.00
54	TOR	2014	1	752,379.00
55	TPC	2014	1	439,584.00

S/N	Company code	YR	EVA coding	Eco capital (R'000)
56	TRE	2014	1	52,463,000.00
57	VLE	2014	1	964,484.00
58	WBO	2014	0	5,868,481.00
59	WNH	2014	0	289,260.00

Source: INET-BFA 2016

APPENDIX 3: CONSOLIDATED STANDARD ERROR (SE) 2005-2014

	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year
Factors	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
M1	1.12	17344.	42790.4	40192.9	40192.9	40192.9	40192.9	56841.4	56841.5	56841.4
M2			1.471	10025.6	0.785	0.789	0.766	0.804	0.874	1.097
S1	2603	22279.	17844.4	1.779	1.335	1.323	1.160	1.154	1.323	1.663
S2	1.15	17371.						40192.7	40192.9	40192.9
S3			1.299	1.122	0.854	0.851	0.853	0.860	0.958	1.072
P1	2603	22695.	18324.6	1.721	1.372	1.312	1.095	1.058	1.125	1.346
P2	4656	50708.	40192.9	40182.9	40192.9	40192.9	1.707	1.812	2.299	3.229
P3	1839	5903.4	14681.3	1.358	0.922	0.946	0.856	0.838	0.944	1.192
C1	2349	37330.	25751.3	41424.4	40192.9	40192.9	1.905	40192.9	1.083	1.782
C2	1.02	27925.	1.784	1.472	1.124	1.030	1.033	0.966	0.991	1.394
C3		28438.	8869.35	1.493	1.154	1.034	1.063	0.932		
G1	1.18	10301.	1.265	1.015	0.739	0.724	0.713	0.742	0.816	1.504
G2	4420	27789.	40192.9	13758.0	27550.1	28149.6	28408.3	1.224	28196.4	2.961
Constant	1.14	34899.	1.844	1.618	1.162	1.045	1.155	0.963	1.018	1.652

Source: Output of the logistic regression processed on SPSS. Refer to Table 3.1 for the meaning of factors.

APPENDIX 4: CONSOLIDATED WALD STATISTICS: VARIABLES IN THE EQUATION 2005-2014

	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year
Factors	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
Market (M)	0.211	0.000	0.427	0.000	0.433	0.197	0.164	2.087	1.526	1.652
Sub-sector(S)	0.146	0.000	0.203	1.140	2.541	3.495	3.463	4.611	6.173	7.374
Product (P)	0.000	0.000	0.000	1.725	1.705	2.897	0.916	0.174	0.444	2.231
Capital size ©	0.0215	0.000	0.023	0.715	3.418	2.754	0.247	0.310	1.645	5.654
Gearing (G)	0.003	0.000	1.105	0.317	3.233	1.200	0.000	1.505	1.139	7.285
Constant	1.140	0.000	0.041	1.265	0.530	0.299	0.061	1.194	3.025	1.020

Source: Output of Logistic regression processed on SPSS.