SUSTAINABILITY REPORTING AND STAKEHOLDER VALUE CREATION IN SELECTED JSE LISTED MANUFACTURING COMPANIES IN SOUTH AFRICA

BY

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DEDICATION

I dedicate this dissertation to my parents Mr Jacob and Mrs Rebecca Malapa, and my siblings Nakeng, Sefako, Dikeledi, Refilwe, Tshepo and Lefatane for the unconditional love and support they have always presented to me.

Dikgomo wee!!!!!

DECLARATION

I declare that "**SUSTAINABILITY REPORTING AND STAKEHOLDER VALUE CREATION IN SELECTED JSE LISTED MANUFACTURING COMPANIES IN SOUTH AFRICA"** dissertation as submitted to the University is my own work and that I have never submitted this dissertation to any University. I have acknowledged, referenced all the material and sources contained in this dissertation.

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Full Names   **Date**

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ABSTRACT

Sustainability reporting (SR) in South Africa is on a 'report and explain' basis because the King IV Code has not made it mandatory for all companies operating but only for those companies listed on the Johannesburg Stock Exchange. It has become difficult to align SR with stakeholder value creation. This study examines the relationship between SR and stakeholder value creation represented by employees' health and occupational safety, return on assets, community projects and green investments. The study used a quantitative method that utilises the multiple regressions method to analyse data from selected manufacturing companies for 11 years (2007-2017) listed at South African Johannesburg Stock Exchange's (JSE). The study measures the relationship between employees' health and occupational safety, investment in community projects, green investments and ROA. Results show insignificant relationships between employees' health and occupational safety and ROA, investment in community projects and ROA and green investments and ROA. The study recommends future research on all sectors or inter-country research on sustainability reporting and stakeholder value creation.

Keywords: *sustainability, sustainability reporting, stakeholder value creation, employees' health, occupational safety, community projects, green investments, return on assets.*

Table of Contents

LIST OF FIGURES

LIST OF TABLES

CHAPTER ONE: GENERAL INTRODUCTION

1.1 Introduction

The International Integrated Reporting Council (IIRC) states that communication about value creation to stakeholders should be included in corporate reporting (International Integrated Reporting Council, 2013). Sustainability reporting (SR) enables companies to take into consideration, the impacts of sustainability issues and as such companies need to be translucent to internal and external stakeholders about opportunities and threats faced (Global Reporting Initiative, 2013). Stakeholders are parties who are affected by companies' activities with diverse interests that need to be satisfied (Freeman, Harrison, Wicks, Parmar & De Colle, 2010). The stakeholders can exercise pressure on companies because they do not exist in isolation and as such depends on the environment for resources, the society for social legitimacy through mutual relationships with one another (Freeman *et al.*, 2010). Each company needs to identify its peculiar set of stakeholders. The diverse groups of stakeholders may be internal such as employees, board members and managers or external such as customers, investors, partners, competitors (Marcinkowska, 2013). Stakeholders continually expect companies to report on their activities with regards to social, economic and environmental impacts (Logsdon & Lewellyn, 2000). Hence, reporting on the activities of the company to its stakeholders promotes trust and confidence among the parties by engaging in projects that meet the needs of the different stakeholders.

Sustainability projects are implemented in companies with a desire of remaining competitive in markets where customers highly value and expect sustainability and to support the current and future generations' wellbeing (James, 2015a). Also, SR benefits companies that seek to create, improve or repair a brand, signal trustworthiness, reach social-choice consumers and maintain their license to operate. SR has a positive effect on customer loyalty, reputation and increase the profit of the company (James, 2015b). As companies are continually expected to report on sustainability, the King IV Code on Corporate Governance provided guidelines tailored after the Global Reporting Initiative (GRI) to assist companies in reporting on their environmental and social activities to the stakeholders. Additionally, the King IV Code mandated only Johannesburg Stock Exchange (JSE) listed companies to report on sustainability activities. This study seeks to align SR with stakeholder value creation as it is difficult for stakeholders to determine how manufacturing companies have created value by meeting their expectation. This study used employees' health and occupational safety, community projects, green investments and return on assets to measure the relationship between SR and stakeholder value creation. Value creation was used as a measure because, the stakeholder theory postulates that the stakeholders' needs should be addressed for value creation. SR indicators include investment in employees' health and occupational safety, investment in community projects and green investments. Engagement in the abovementioned activities by manufacturing companies, creates value for stakeholders. The next section presents the research problem.

1.2 Research problem

SR in South Africa is on a 'report and explain' basis because the King IV Code has not made it mandatory for all companies operating but only for those companies listed on the JSE (Global Reporting Initiative, 2011). Moreover, it is difficult to align SR with stakeholder value creation. This difficulty is exacerbated by the inability of the different stakeholder groups to link most of the content of the SR to their information needs and expectation. Furthermore, the challenge stems from the failure on the part of stakeholders to appropriately align the content of the SR in determining the value derived from the activities of the company. Hence, this study examines how companies especially those in the manufacturing sector create value that meets their different stakeholders' expectation. Moreover, the manufacturing sector was chosen because most of their activities affect the different stakeholder groups.

1.3 Aim of the study

This study aims to determine whether SR correlates with stakeholder value creation.

1.3.1 Research hypothesis

This study resolves the following research hypothesis:

H_1: There is no correlation between employees' health and occupational safety expenditure and Return on assets (ROA)mong selected JSE listed manufacturing companies.

H_2: There is no correlation between investment in community projects and ROA among selected JSE listed manufacturing companies.

H_3: There is no correlation between green investment and ROA among selected JSE listed manufacturing companies.

1.3.2 Objectives of the study

The study aims to examine the relationship between SR and stakeholder value creation. Hence, the objectives of the study are:

- To examine whether there is a correlation between employees' health and occupational safety and ROA among selected JSE listed manufacturing companies.
- To examine whether there is a correlation between investment in community projects and ROA among selected JSE listed manufacturing companies.
- To examine whether there is a correlation between green investments and ROA among selected JSE listed manufacturing companies.

1.4 Research methodology

The correlational research design was adopted in this study. Additionally, the positivist paradigm was used since this study is quantitative (Creswell, 2012; Curtis, Comiskey & Dempsey, 2015). Data used in this study is secondary. Data were collected from JSE listed manufacturing companies' sustainability reports, annual integrated reports and IRESS database. Data collected were considered valid because sustainability and annual

integrated reports are prepared following the JSE requirements and are audited. Twenty-six manufacturing companies were purposively sampled for this study. Panel data analysis was used to respond to the research hypothesis in this study.

1.5 Significance of the study

This study will contribute to academia, industry and society in the following manner:

1.5.1 Academia

Results from this study will add to the existing body of knowledge and literature on SR and stakeholder value creation. It will also pave ways for future studies in the field of SR and stakeholder value creation for those researchers who opt to research on sustainability and stakeholder value creation.

1.5.2 Industry

This study might encourage manufacturing companies to implement sustainability initiatives such as employees' health and occupational health, community projects and green investments that will lead to improved company performance and contribute to reducing companies' environmental impact.

1.5.3 Society

This study might help society gain more insight into the operations of manufacturing companies on the issue of sustainability initiatives.

1.6 Limitation of the study

Twenty-six manufacturing companies listed at the JSE in South Africa were sampled. Manufacturing companies that were not listed on the JSE were excluded in this study because it was difficult to collect time series data that were publicly available. There are many companies from different sectors listed at the JSE but this study was limited to manufacturing companies. Other researchers can use other sectors and an increased sample.

1.7 Definition of key terms

Corporate social responsibility refers to strategies on how companies conduct their business in a way that is ethical, society friendly and beneficial to the community in terms of development (Babalola, 2012). Moreover, CSR activities may include charitable contributions to local and national organisations such as fundraising, donations and gifts in areas where it trades and others like regeneration of deprived communities, reclamation of derelict land and creation of new regeneration jobs (Babalola, 2012).

Debt-equity ratio is defined as a ratio that measures a company's ability to pay its long and short-term debts because it is a predictor of ROA (Kamar, 2017). This ratio is calculated by dividing the total liabilities by total equity of a company.

Employees: refers to any person employed by a company remunerated in wages or salary working under the supervision of company supervisors or the company itself (South African Government Gazette, 1990-1999).

Energy efficiency: it involves reducing energy usage input such as heating or cooling leading to better company conditions (Kohler, 2014).

Green investments: is defined as the investment that principals a reduction in greenhouse gas and air pollutants emissions without disruption in the process of production and consumption of non-energy products (Ganda, Ngwakwe & Ambe, 2017)

Green processes: comprise of new green products and processes of renewal (Luan *et al.*, 2016).

ISO 14000: is an international environmental standard that provides a guideline on how companies can improve environmental aspects performance, develop green products and promote the efficiency of products (Hasan & Chan, 2014; Luan, Tien & Chen, 2016).

King IV Code: is a non-legislative document that focuses on stakeholder inclusivity and responsiveness and it is based on principles and practices of reporting a company's sustainability and governance practices (IoDSA, 2016).

Operating profit margin: is a profitability ratio that measures the effectiveness of a company. This ratio is calculated by dividing operating profit with net sales (Tulsian, 2014).

Return on assets refers to the company's capability to invest in its assets (Dewi, Sudarma, Djumahir & Eko, 2014). When companies engage in sustainability activities, such as investing in employees' health and safety, community projects and green investments, these might lead to increased productivity and sales thereby creating value,

which is measured by ROA in this study. ROA is expressed in terms of ratios, and it is used to analyse and interpret financial statements.

Stakeholders: are parties that are affected by the activities of the company (Freeman, 1984).

Stakeholder theory: focuses on companies' ethical behaviour and how management handles issues that affect them (Miles, 2012). This theory identifies the creation of value as a company's driver and recognises that this value is to be shared by all actors of the society who are interested in the company's operations (Freeman, 1984).

Sustainability reports: are reports used by companies to provide accountability to stakeholders (Junior, Best & Cotter, 2014). The preparation of sustainability reports is guided by principles of reporting and implementation contained in GRI.

Value creation: involves companies trying to generate social results to accomplish stakeholders' expectations and thus the development of a relationship with stakeholders (Strand & Freeman, 2015). In this study, value creation was measured by ROA.

1.8 Structure of the study

Chapter One to chapter Five are structured as follows:

Chapter One: Introduction

This chapter introduced the background of the study. The problem statement, aims and objectives of the study were outlined. Significance and limitations of the study were also outlined.

Chapter Two: Literature review

This chapter reviewed the literature on SR and stakeholder value creation. Stakeholder theory and King IV Code were also discussed. South African Government Gazette (1990-1999), GRI 403(2016) and OHS Act 85(1993) were discussed.

Chapter Three: Research Methodology

This chapter explained the research methodology employed in this study. Research design, paradigm, method, data collection approach, population, sample and sampling, dependent, independent and control variables were explained.

Chapter Four: Data analysis and discussions

This chapter discussed the results relating to the hypothesis and the research problem and the findings of the study were discussed.

Chapter Five: Summary, conclusion and recommendation

This chapter presents a summary of the study, recommendations, paths for future researches and the conclusion**.**

1.9 Summary of the chapter

This chapter presented the study background, research problem, aim and objectives of the study. Research hypothesis were also presented in this chapter. The next chapter presents the literature review.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

The previous chapter introduced the background of the study, research problem, aims of the study, hypothesis and the objectives of the study. This chapter reviews existing literature on SR, sustainability reports, sustainability reports and stakeholder value creation, employees' health and occupational safety expenditure and ROA, community projects expenditure and ROA and green investments and ROA. Section 2.2 discussed theoretical framework which is the stakeholder theory. The King IV Code on corporate governance is discussed in Section 2.2.2. Section 2.3 discussed SR which is in two parts, namely, sustainability reports and GRI guidelines. Section 2.4 reviewed literature on employees' health and occupational safety which is in three parts, namely, employees' health, occupational safety and employees' health and occupational safety with ROA. Section 2.5 discussed sustainability reports and stakeholder value creation. Section 2.6 reviewed the literature on community projects expenditure and ROA which are in two parts, namely, company benefits from engaging in CSR and community benefits from CSR. Section 2.7 reviewed literature on green investments which are in two main parts, namely, types of green investments and components of green investments.

2.2 Theoretical framework

This section discusses the theoretical framework- the stakeholder theory. According to Susith and Steward (2014), there are three CSR theories that explain CSR practices, namely, legitimacy theory, stakeholder theory and institutional theory. Legitimacy theory

in the area of CSR limits the disclosure of CSR activities, stakeholder theory emphasises that companies should be responsible for disclosing CSR activities and institutional theory considers CSR disclosure and engagement as voluntary (Susith & Steward, 2014). Furthermore, there are some similarities between sustainability management and stakeholder theory that guide and support the adoption of stakeholder theory in this study (Horisch, Freeman & Schaltegger, 2014). First, is the purpose of business wherein both sustainability management and stakeholder theory extend the view on the business purpose further than getting the most out of temporary shareholder value (Horisch *et al*., 2014). Second, is the error of separation which stresses refusal of the idea that ethical issues can be separated from the company and lastly the opposition to residual CSR as companies are dared to incorporate responsibility into their core business (Horisch *et al*., 2014). Also, both stakeholder theory and sustainability management exemplify and connect descriptive, prescriptive and instrumental elements. This study, therefore, adopts the stakeholder theory.

2.2.1 Stakeholder theory

Stakeholder theory refers to stakeholders as parties that are affected by the activities of the company. Furthermore, the theory suggests ways in which management should meet the interest of the stakeholders (Miles, 2012). Additionally, stakeholder theory is a theory of company ethics and management about the handling of issues that affect them. Also, as a feature for managing a company, the stakeholder theory addresses its principles and standards clearly (Phillips, 2003). The stakeholder theory further identifies the creation of value as a company's driver and recognises that this value is to be shared by all actors

of the society who are interested in the company's operations (Freeman, 1984). Furthermore, this theory is organised under two main questions. The first question is about a company's objectives and the other about the company's responsibility towards its stakeholders (Freeman, 2000). The stakeholder theory is an idea to solve problems (Freeman *et al.*, 2010). Among the problems to be solved include (a) the problem of value creation and trade, (b) the problem of ethics of capitalism and, lastly (c) the problem of managerial mind-set (Freeman *et al.*, 2010). Furthermore, there are three types of stakeholder theories, namely, normative stakeholder theory, descriptive stakeholder theory and instrumental stakeholder theory (Donaldson & Preston, 1995). Normative stakeholder theory deals with how managers together with stakeholders should act and view the purpose of the company. Descriptive stakeholder theory deals with correspondence between stakeholder theory concepts and reality. Instrumental stakeholder theory deals with managers' configuration of decisions with regards to the interest shown by stakeholders in the company's CSR activities and outcomes thereof (Donaldson & Preston, 1995).

However, based on Donald and Preston (1995) stakeholder theories, Horisch *et al.* (2014) emphasise that there are four types of stakeholder theory and their difference is based on each theory's focus. According to Horisch *et al.* (2014), the first stakeholder theory type is descriptive or empirical stakeholder theory which focuses on the description of how companies are managed and the identification of company stakeholders. The second type is instrumental stakeholder theory that focuses on the stakeholder management impact on the attainment of corporate goals (Horisch *et al.*, 2014). The third type is

normative stakeholder theory that concentrates on discussions around issues of business purpose and stakeholder theory moral justifications (Horisch *et al.*, 2014). The fourth type is an integrative theory that considers the first, second and third types of stakeholder theory as outlined above, to have a complicated relationship (Horisch *et al.*, 2014).

Furthermore, the stakeholder theory contains a pool of thinking, expressions and metaphor in correlation with the company's main drive that is to build probable value to its stakeholders (Strand & Freeman, 2015). Stakeholder theory pays attention to companies that seek to meet their stakeholders and company sustainability. This theory does include not only the company shareholders but also those groups that have vested interest in the company (Roy & Goll, 2014). Stakeholders can influence companies to take corporate citizenship behaviour (Mahmood & Orazalin, 2017). Furthermore, stakeholder theory guides and supports companies that implement and engage in CSR activities (Mahmood & Orazalin, 2017).

However, some scholars criticise the stakeholder theory with the perception that since shareholders are company owners, companies should serve only them (Weiss, 2014). Furthermore, scholars criticise that stakeholder theory repudiates and deteriorates fiduciary obligations that managers have towards shareholders. The stakeholder theory is further criticised of deteriorating the influence and power of stakeholder groups and that it weakens the company. Moreover, the theory affects the long-term character of the system of capitalism (Weiss, 2014). Since community projects benefit the society, safety in workplaces benefits the employees and investment in green activities benefit the broader environment, customers and investors, the stakeholder theory was considered

appropriate for this study. Moreover, the stakeholder theory highlights that the needs of the different stakeholders such as community, employees, customers and investors should be addressed for stakeholder value creation. Therefore, manufacturing companies need to recognise and meet the demands of the diverse stakeholders because by satisfying these stakeholders, the company can create value for both the internal and external stakeholders.

2.2.2 The King IV Code on Corporate Governance

The King IV Code is a non-legislative document based on principles and practices of reporting a company's sustainability and governance practices (IoDSA, 2016). King IV's philosophy focuses on stakeholder inclusivity and responsiveness. (IoDSA, 2016). Stakeholder inclusivity means that the company stakeholders have value for decision-making in the company's best interest (IoDSA, 2016). According to IoDSA (2016), stakeholders can either be internal or external. Internal stakeholders are those stakeholders that are directly affiliated to the company such as employees, governing body, management and shareholders. Additionally, external stakeholders are those not directly affiliated to the company such as government, customers and consumers. Internal stakeholders are considered material whereas external stakeholders may seem not to be material (IoDSA, 2016). However, internal or external stakeholding, they need to be included in all dealings of the company; hence, stakeholder inclusivity.

Furthermore, the King IV code advocates a stakeholder inclusivity approach in which the responsibility of legitimate interests, needs and expectations of all stakeholders are in the

hands of the governing body (IoDSA, 2016). Additionally, when contrasting King IV's focus on stakeholders taking into account the Companies Act, it becomes easier to comprehend what it is meant by company stakeholders as well as responsibilities attached to it (IoDSA, 2016). Furthermore, in order to enhance stakeholder involvement in the company affairs, social and ethics committees should be given a chance to play a part in the company (IoDSA, 2016). In other words, by involving all stakeholders and also giving those stakeholders a chance to give inputs in company affairs, promotes stakeholder inclusivity.

Also, contained in the King IV Code, are the principles and practices that deal with relationships to stakeholder-inclusivity approach (IoDSA, 2016). The code further highlights that companies do not put more consideration on societal and environmental impacts and results of their daily activities but merely responsible for the economic bottom line (IoDSA, 2016). This means that there is no balance with regards to these three dimensions, namely, economic, social and environmental and as such, the value and benefits to stakeholders might be eroded.

King IV code is based on governance outcomes, and it benefits stakeholders. If a company is well governed, it motivates its stakeholders and drops the cost of the company's capital (IoDSA, 2016). Furthermore, integrated governance that leads to sustainability is good for the economy, society and the country (IoDSA, 2016). Principle two (2) of King IV code states that a company's ethics should be administrated in a way that a principled culture is supported (IoDSA, 2016). This principle is a recommended

practice that the governing body should approve codes of conduct and ethics policies as well as to ensure that they include stakeholders and key ethical risks (IoDSA, 2016).

Also, the governing body should ensure that there are ways for stakeholders to become familiar with the codes of conduct and ethics policies (IoDSA, 2016). Furthermore, principle five (5) states that the governing body should make it a point that the company issues reports to stakeholders so that informed assessments of the company's performance, its short, medium- and long-term prospects are made (IoDSA, 2016). Also, the principle recommends that the governing body should administer and ensure that reports are biddable with legal reporting requirements and that the stakeholders' needs are met (IoDSA, 2016).

Moreover, it is the responsibility of company management to develop and maintain an ongoing relationship with company stakeholders and to achieve that, companies should understand the needs and expectations of their stakeholders (IoDSA, 2016). Furthermore, understanding the stakeholder's needs, interests and expectations helps those involved in strategic management to develop better strategies (IoDSA, 2016). Also, these relationships with stakeholders need to be kept as an everyday item to keep the company's board of directors appraised of the current relationship status between the company and its stakeholders (IoDSA, 2016).

2.3 Sustainability reporting

SR is a tool that increases transparency and accountability of non-financial items that financial reporting does not deal with (Greiling, Traxler & Stotzer, 2015). There are guidelines to be followed by companies for reporting on sustainability. Those guidelines are outlined in the GRI (Munshi & Dutta, 2016). Companies' sustainability reports should be examined to help evaluate as to whether or not companies try to meet expectations in line with SR and if so, in what manner (Greiling *et al.*, 2015). James (2015a) investigates about the nature and extent of sustainability reporting methods by small and mid-size companies, that is to determine if investors, customers, employees as well as other interested individuals' need are met in the sustainability reports. It was found that some companies which reported on sustainability applied the GRI guidelines while others produced reports, but their reports were not in line with the GRI guidelines (James, 2015a). Moreover, a high percentage of small companies did not even publish a substantial amount of sustainability-related information (James, 2015a). In contrast, Greiling *et al.* (2015) focused on SR in Austrian, German and Swiss public sectors to examine the balance of information with regards to the three SR indicators (social, environmental and economic) and found an indication that there is a weighty and considerable variation with regards to the level of implementation of GRI guidelines. These different levels of uptake are due to the nature of the businesses; that is being small businesses or being public or listed. Hence, there should be a balance of information in reporting with regards to the three dimensions of SR.

2.3.1 Why sustainability reports?

Sustainability emanated from the concept of sustainable development, which is made up of three dimensions, namely; social, environmental and economical (Dissanayake, Tilt & Xydias-Lobo, 2016). The social dimension involves society giving a company permission to operate in its community so that the society can benefit, the environmental dimension involves the company's responsibility towards the environment, and economic benefit involves the financial benefits to the company (Scarcy & Buslivish, 2014).

Furthermore, sustainability reports are used by companies in order to provide accountability to stakeholders (Junior *et al.*, 2014). Sustainability report contains qualitative and quantitative information that stakeholders have an interest in with regards to the company's sustainability issues and initiatives (Scarcy & Buslivish, 2014). Companies rely on SR guidelines to help their report development and to address the needs of different stakeholders since stakeholders should be involved in the development of sustainability reports (Scarcy & Buslivish, 2014). Additionally, companies are motivated to produce sustainability reports as it adds value to building trust when they become transparent to stakeholders (Global Reporting Initiative, 2013). Apart from the abovementioned motivations for producing sustainability reports, there are other motivations, namely, internal pressure motivation, external pressure motivation and, an endeavour for companies to share their stories (Scarcy & Buslivish, 2014). However, Sridhar and Jones (2013) investigated on the three criticisms of the triple bottom line approach and found that among the three dimensions, only social performance is too complex to define because it affects communities differently. Hence, as one of the

stakeholders' needs are that companies should formally report on sustainability efforts, manufacturing companies should, therefore, try to produce those reports to meet stakeholders' needs and expectations. Additionally, preparations of sustainability reports by manufacturing companies will catch the interest of investor which might lead to the provision of more capital.

2.3.2   G4 - Global Reporting Initiative(GRI) Guidelines

G4 reporting guidelines were established to offer a globally applicable framework to support consistent methodology to reporting by encouraging the degree of transparency and consistency that is needed to make information valuable and beneficial (Global Reporting Initiative, 2013). The GRI guidelines provide companies of any size, sector or location with principles of reporting and implementation manual for the preparation of sustainability reports (GRI, 2013). Additionally, the reporting principles and standard disclosure of the GRI guidelines cover the reporting principles, standards disclosure as well as the reporting criteria to be followed by companies in preparations for their sustainability reports (GRI, 2013). Moreover, the implementation manual of the GRI includes the enlightenment of how reporting principles should be applied (GRI, 2013). Furthermore, this implementation manual also contains the information to be disclosed as well as how to interpret different concepts contained in the guidelines (GRI, 2013). Also contained in the GRI guidelines, are the steps to be followed when preparing sustainability reports, namely, obtaining an overview, choosing the preferred method, preparing to disclose general standard disclosures, preparing to disclose specific standard disclosures and then preparing the sustainability report (GRI, 2013).

2.4 Sustainability reports and stakeholder value creation

Stakeholder theory maintains that it should be every company's priority to create value for its stakeholders (Strand & Freeman, 2015). Previously, the focus of companies was to satisfy the needs of customers for financial gains, but that focus has now shifted to the creation of value for stakeholders (Benn, Abratt & O'Leary, 2016). Additionally, creating value is not about defeating the competitors but involves companies attempting to generate social results to fulfil stakeholders' expectations and thus the development of a relationship with stakeholders (Strand & Freeman, 2015). Companies' dependency leads to the development of different relationships on stakeholders for support (Herremans, Nazari & Mahmoudian, 2016; Junior *et al.*, 2014). There is a need for transparency where information regarding the fundamental aspects of SR process should be considered (Herremans, Nazari & Mahmoudian, 2016; Junior *et al.*, 2014). Transparency is among ways of valuing stakeholders and in exercising transparency, companies can involve stakeholders in sustainability reports development, hence value creation (Junior *et al.*, 2014). Five features of SR are associated with stakeholder engagement strategies of a company, namely, using stakeholder engagement for learning, stakeholder inclusivity in the broad, directness of communication, clarity of stakeholder identity and deliberateness of feedback collection (Herremans, Nazari & Mahmoudian, 2016). Benn, Abratt and O'Leary (2016) established how companies' senior management identify their stakeholders and stakeholders were also asked to explain their roles in relation to the company and found that some are primary stakeholders without whom the company ceases to operate, and others are secondary stakeholders who influence the company

but without whom the company continues to operate. However, primary or secondary stakeholding, manufacturing companies should give company stakeholders the level of focus and satisfy their needs, hence stakeholder value creation.

2.5 Employees' Health and Occupational Safety Expenditure

Occupational Health and Safety (OHS) Act 85 of 1993 states that every employer should provide and maintain a safe working environment without risk to the health and safety of the employees (South African Government Gazette, 1990-1999).

2.5.1 Employees' health

Employee refers to any person who is employed by a company, who receives remuneration in the form of wages or salary working under the supervision of company supervisors or the company itself (South African Government Gazette, 1990-1999). The first requirements in workplaces are a safe and healthy workplace and the acquisition of a healthy lifestyle (Ozvurmaz & Mandiracioglu, 2017). Issues of employees' health have risen and as such creating a healthy working environment by engaging in health promotions is necessary for companies to encourage employees to acquire healthy behaviour. The Occupational health and safety (OHS) Act 85 of 1993 guides companies on how they should provide and maintain working environments that are safe, without risk to the health and safety of the employees (South African Government Gazette, 1990-1999; Shah, Kapoor, Cole & Steiner, 2016). Factors such as injustice and unfairness at workplaces can impact on the employees' health (Robbins, Ford & Tetrick, 2012).

Additionally, there are other factors apart from the abovementioned, that can affect an employee's health in workplaces. Among those factors is stress that might lead to employee's mental and physical health impairment and then low productivity (Reimann & Guzy, 2017). Furthermore, in workplaces, burnout has also become an occurrence and a concern, and it is considered a challenge to employees' health and wellness and company performance (Carod-Artal & Vazquez-Cabrera, 2013; Ninaus, Terlutter & Huang, 2015). In other words, work-related factors such as extended working hours, stress and burnouts affect employees' health, and that result in absenteeism, lower productivity, stressful behaviours and reduced focus in workplaces by employees (Kunte, 2016; Reimann & Guzy, 2017).

A workplace has a direct influence on the physical, mental, economic and social wellbeing of employees and as such companies should try as much as possible to engage in health promotion initiatives (Ozvurmaz & Mandiracioglu, 2017). Health promotion initiatives include among others, health responsibility, physical activities and stress management (Ozvurmaz & Mandiracioglu, 2017). Baxter, Sanderson, Venn, Blizzard and Palmer (2014) focused on the relationship between the quality of health promotion programs in workplaces and firm performance and found a positive relationship. Additionally, Ozvurmaz and Mandiracioglu (2017) focused on determining lifestyle behaviour that is healthy that affected the risk factors in employees at small and medium-sized companies and found that employees who benefit from occupational health and safety services display a healthy lifestyle. In contrast, MCPhail-Bell, Bond, Brough and Fredericks (2015) argue that health promotion in workplaces enforces a particular health

promotion-sanctioned description of what is good, rather than to let employees have control over their health. However, manufacturing companies need to engage in health promotion programs as it resembles the creation of value for employees as stakeholders and thus, it will lead to productivity, hence stakeholder value creation.

2.5.2 Occupational Safety

Occupational safety training contributes positively to higher performance by employees (Hinze, Hallowell & Bank, 2013). Occupational injuries and accidents are mostly caused by non-compliance to machinery regulations and incorrect work practices necessitating safety training to reduce accidents and improve company safety culture as well as to avoid additional costs incurred by the employer (Stuart, 2014; Misuirek & Misiurek, 2017). Companies should, therefore, promote safety issues in workplaces such as training within industry (TWI) programs leading to a safety climate (Jafari, Gharari, Ghaffari, Omidi, Kalantari & Fardi, 2014). Stuart (2014) focused on student experiences of safe work practices and safety culture upon being employed in manufacturing industries. Results revealed that, upon completion of their studies, students possess experience gained from the laboratory but lack industrial skills, confidence and experience in operating industry machines proficiently. In other words, a lack of industry machine operation experience necessitates safety training in manufacturing companies. In contrast, Nordlof, Wiitavaara, Winblad, Wijk and Westerling (2015) investigated workers' perspectives about safety training and found that workers feel that it is upon them to make the best from their work environment. In other words, workers take responsibility for their safety at workplaces. Hence, manufacturing companies should provide safety training for the employees as this

will result in employees feeling valued by their employers and commit more to their jobs leading to greater productivity and profits for the company. Additionally, accidents will be less and as such there will be no absenteeism caused by occupational injuries and productivity will not be in jeopardy. Furthermore, since manufacturing companies are defenceless to accidents due to the nature of the business, is it important that safety in these industries be improved and maintained at all times.

2.5.3 Employees' Health and Occupational Safety Expenditure and Return On Assets (ROA)

Employees' health and occupational safety is considered a human right to employees and as such companies have a responsibility of designated health and safety representatives in the workplace whom should ensure that the health and safety measures put in place are useful and efficient (South African Government Gazette, 1990-1999; Global Reporting Initiative (GRI 403, 2016). Designated health and safety representatives should identify possible hazards and possible major incidents at the workplace (South African Government Gazette, 1990-1999). Occupational health and safety (OHS) Act 85 of 1993 further states that health and safety representatives should scrutinise the causes of incidents in the company and investigate complaints relating to health and safety issues. Additionally, health and safety representatives are responsible for inspecting the workplace to ensure that there are no dangerous items laying around that might cause danger to the employees. Moreover, the GRI 403 have set out requirements on occupational health and safety that any company of any size, type or sector can use for pro-activeness. A proactive approach to occupational health and safety

leads to a positive level outcome by employees (Haslam, O'hara, Kazi, Twumasi & Haslam, 2016). Companies that have always been proactive in the management of employees' occupational health and safety have had higher profit margins, lower accidents rates, job satisfaction, more positive safety climate perceptions across eight of the nine safety climate dimensions, an improved organisational commitment by employees (Haslam *et al.*, 2016). In contrast, Anyfantis, Boustras and Karageorgiou (2018) highlight that the cost of implementing and maintaining employees' health and occupational safety in times of financial crisis is usually higher. However, companies should implement employees' health and occupational safety programs to encourage employees to work hard resulting from feeling valued leading to an increase in company productivity and sales. Furthermore, the more sales the company makes, the greater the profits hence return on company assets.

2.6 Community projects expenditure and Return on Assets (ROA)

Companies are no longer assessed on financial performance only, but also on social performance such as CSR as represented by community projects which have become a norm (Rhou, Singal & Koh, 2016). Companies' engagement with social responsibility significantly increases the value of shares and that investors are sensory when it comes to the issue of CSR (Ahmed, Abdullah & Ahmed, 2017). Furthermore, awareness of CSR affects how CSR initiative can result in company financial benefit (Rhou *et al.*, 2016). Rivera, Bigne & Curras-Perez (2016) focused on the relationship between CSR and customer satisfaction and found a positive relationship. Also, Xie, Jia, Meng and Li (2017) focused on CSR, customer satisfaction and financial performance and found a positive

relationship. This implies that if customers as stakeholders feel valued, they have trust in the company leading to increased sales and good returns. Moreover, it is the community projects that attract customers as a way of community approval of the CSR projects.

Malik and Nadeem (2014) focused on the influence of CSR in Pakistanian banks' financial performance using variables of profit margins, ROA, return on equity (ROE) and net profit margins and CSR and found that there is a correlation between ROA and CSR, ROI and CSR and net profit margin and CSR. Dabbas and Al-rawashdeh (2012) focused on the effect of CSR on Jordan industrial sector firms' profitability and found that there is a positive relationship between CSR and firms 'profitability expressed in terms of the net profit which contributes positively to ROE. Moreover, Kiran, Shahid and Farzana (2015) focused on the relationship between CSR and profitability of the company in selected listed oil and gas companies in Pakistan using net profit, net profit margin, total assets and CSR and found a positive relationship between CSR and net profit, CSR and net profit margin and a negative relationship between CSR and total assets and therefore concluded that the relationship between CSR and firm performance is significant. In contrast, Mwangi and Jerotich (2013) focused on the relationship between CSR and company performance and found an insignificant relationship. Moreover, Babalola (2012) also focused on the relationship between CSR and firm performance and found a negative relationship. However, companies should engage in community projects as a way of showing appreciation to the society for approving the corporate social activity, hence stakeholder value creation.

2.6.1 Company benefits for engaging in community projects

CSR engagement such as community projects offer companies many plough backs such as increased sales and market share, building up the image, reputation and brand of the company, strengthening the ability to retain gifted and hardworking employees, cost reduction and increased chances of attracting new investors (Vitezić, Vuko & Morec, 2012). Also, community projects help companies win customer loyalty as a result of satisfaction (Lombart & Louis, 2012). This implies that if customers are satisfied with the activities of the company, they become loyal and patronise the company and that leads to higher levels of profitability. Furthermore, since CSR activities affect the earnings of the company and cash flows, the disclosure should be made in reports in order to attract investors. Hence stakeholder theory highlights that CSR disclosure should be made (Susith & Steward, 2014; Martin & Moser, 2016). In contrast, Price and Sun (2017) highlights that companies are not always socially responsible but sometimes socially irresponsible. Lin-Hi and Muller (2013) define corporate social irresponsibility (CSI) as corporate actions that result in possible drawbacks to other actors. In the same vein as CSR affects firm performance, CSI affects firm performance. The value from stakeholders' relationship decreases and customers lose interest in the company upon detecting irresponsible social behaviour of companies (Price & Sun, 2017). Additionally, Price and Sun (2017) upholds that companies engaged less in CSR and less in CSI activities perform better than companies engaged more in CSI and CSR. However, companies should engage in activities that demonstrate social responsibility towards the

community to maintain good relationships with stakeholders, hence stakeholder value creation.

2.6.2 Community benefits from CSR

Communities benefit from external organisations through CSR. Ismail, Alias and Rasdi (2015) uphold that community projects offer better living standards, health and education to the society. The living standard includes improvements in employment, income, electricity, sanitation and housing, whereas the health dimension involves campaigns about cancer and other health programmes and the education dimension involves school-related matters such as children enrolment, schooling expenses, reading literacy, quality education and among others, student performance (Ismail *et al.*, 2015).

2.7 Green Investment and ROA

The question of companies benefiting by being green is of utmost importance and engagement in those green activities leads to better performance (Cordeiro & Tewari, 2015). Green investment is the investment that leads to a decrease in greenhouse gas and air pollutants emissions without affecting production and consumption of non-energy products (Ganda, Ngwakwe & Ambe, 2017). Eyraud, Clements and Wane (2013) highlight the three main components of green investment. Component number one (1) is low-emission energy supply which involves green investment moving the energy supply from fossil fuels to substitutes that are polluting such as solar systems. Component number two (2) is energy efficiency that involves green investment using technological measures that lessen the energy amount needed in the production process (Eyraud *et*

al., 2013). Component number three (3) is carbon sequestration which involves deforestation, reforestation and sequestering more carbon which contributes to low carbon emissions (Eyraud *et al*., 2013). Dubey, Gunasekaran and Ali (2015) highlight that manufacturing companies that engage in green activities benefit from brand improvement and high interest from investors. Xia, Chen and Zheng (2015) measured the relationship between circumstance pressure, green technology selection and firm performance and found a positive relationship. Furthermore, Lee and Min (2015) measured the relationship between green investment and carbon emissions and green investment and firm performance and found a negative and positive relationship respectively. Hence, manufacturing companies should develop and engage in green processes and activities to remedy the environmental problems faced in today's life, and since customers as stakeholders believe in buying green products from green companies, green company profits will increase.

2.7.1 Types of green activities

Stakeholders want to be involved with companies engaging in green activities, that aim to remain sustainable, to support them. This sub-topic discusses the types of green activities companies can engage in, namely, ISO 14000, green processes, prevention of pollution and green certification.

2.7.1.1   ISO 14000

Hasan and Chan (2014) define ISO 14000 as an international environmental standard guideline to be followed by companies in improving environmental aspects performance.

This type of green activity is used by companies to develop green products and to promote the efficiency of products (Luan, Tien & Chen, 2016). Furthermore, companies can adopt ISO 14000 if they aim at decreasing the supply chains' environmental impact, to legitimise and to inform customers about company's effort in addressing environmental issues (Qi, Zeng, Tam, Yin, Wu & Dai, 2011; Wiengarten, Pagell & Fynes, 2013). Adopting ISO 14000 includes setting objectives, environmental management implementations programs like recycling of waste, growing employee involvement and communication throughout the company, growing communication between project parties, frequently revising programs and encouraging continual improvement (Zhang, Yuzhe Wu & Shen, 2015). Sebastianelli, Tamimi and Iacocca (2015) examined the relationship between environmental performance improvement and market value increment for publicly traded operations using ISO 14000 portfolio performance and other funds and found that ISO 14000 as compared to other funds appears to be a pay-off tactic in the long run.

In contrast, Vilchez (2017) argues that the embracing of ISO is not primarily allied with the development of the companies' proficiencies that assist the company to accomplish a substantial decrease in the negative environmental impact. Additionally, there are many bureaucratic required when ISO is adopted, and there is a limited character of continuity to evaluate progress attained (Heras- Saizarbitoria & Boiral, 2013). Hence, manufacturing companies should introduce ISO standards to decrease environmental impacts caused by their activities to show value to the society, hence the creation of value.

2.7.1.2   Green processes

This type of green activity includes new green products and processes of renewal (Luan *et al.*, 2016). This implies that companies need to either create new products that are clean or renew their processes in order to become more efficient. In the manufacturing of green products, manufacturing companies needs to take into consideration the three (3) "Rs" namely, remanufacture, reduce and reuse or recycle (Govindan, Diabat & Shanka, 2015). One of the reasons for manufacturing companies to go green is reducing the environmental impact caused by their daily activities to save the health of the society, hence value creation (Robinson & Stubberud, 2015). Green manufacturing, thus the production of green products leads to higher performance as customers highly value green products as compared to non-green products due to quality and environmental safety (Borin, Lindsey-Mullikin & Krishnan, 2013). To ensure environmental safety and to move towards sustainability, companies should have environmental management and green innovation strategies in place, namely, the adoption of green products and processes that do not harm natural resources as depletion of these resources has become a problem in societies (Zhu, Sarkis & Lai, 2012; Triguero & Moreno-Mondejar, 2013; Yin, 2015; Huang & Li, 2017). Cai and Zhou (2014) define green innovation as an invention that leads to a decline in environmental impact. Huang and Li (2017) examined the impact that green process innovations and greens products have on company environmental performance and found a positive relationship.

In contrast, Robinson and Stubberud (2015) argue that, of all the companies involved in both green product and processes, only large companies value the reduction of

environmental impact and consider it as a salient objective for green innovation. Hence, manufacturing companies should produce green products as a way of addressing the issue of environmental impact caused by its activities to attract more investors and customers leading to increased sales and more investments. This implies that for companies that want to remain sustainable in future, engaging in green activities is advisable. Improvements in technology and prevention of pollution are incorporated in green innovation (Aquilera-Caracuel & Ortiz-de-Mandojana, 2013).

2.7.1.3   Prevention of pollution

Prevention of pollution as a type of green activity is used by companies which are involved in recycling to improve environmental performance (Yilmaz, Anctil & Karanfil, 2015; Luan *et al.*, 2016). Prevention of pollution is therefore regarded as one of the innovative strategies for decreasing environmental impacts (Aquilera-Caracuel & Ortiz-de-Mandojana, 2013). Ngwakwe (2011) defines pollution prevention as practices of implants of industrial plants that eradicates the industrial pollution affecting the environment. Since manufacturing companies are ranked the most polluting industries and, in applying the prevention of pollution approaches, manufacturing companies should concurrently assess the environmental benefit, environmental impacts and the BATs implementation costs (Yilmaz *et al.*, 2015; Luan *et al.*, 2016).

Furthermore, Department of Environmental Affairs and Tourism in South Africa further outlines the prevention of pollution policy focusing on the production system known as Extended Producer Responsibility(EPR) which has a goal of sustainable company

development (DEAT, 2005b). Additionally, Business for Social Responsibility (2001) outlines the following as motivation for companies to adopt EPR:

Reduced Costs: Companies can reuse the materials for new products leading to a reduction in the use of raw material and cost of manufacturing.

Customers trust: Companies taking responsibility and addressing environmental issues gain customers' trust and retains customers for a long time which leads to a higher number of products sold resulting in higher revenue.

Reduce Production Time/Lower Production Costs: When a whole product can be used in the new generation product, some production processes can be disregarded leading to a speed production process, increased productivity and the reduced time for the product to reach the market place.

Improvement in Decision-Making: Companies adopting EPR approach to lifecycle management makes informed and better decisions.

Creates New Market Opportunities: Companies adopting EPR approach can spark product design innovation and delivery, creating new market opportunities. However, Hoque and Clarke (2013) focused on the greening of industries in Bangladesh with the objectives of documenting prevention of pollution choices and the use of pollution prevention choices and comparing the practices of pollution prevention across industries ranked to be highly pollutant. Results showed that all sampled industries' manufacturing processes are still pollutant influencing human health, natural environment, socio-economic aspects leading to increased social costs. In contrast, Bhupendra and Sangle (2016) focused on the prevention of pollution strategies adopted in Indian manufacturing

companies and found that prevention of pollution is being taken as a priority. Hence, South African manufacturing companies should prevent pollution caused by their activities in order to reduce carbon emissions and to avoid monetary fines such as carbon emission tax. Apart from the monetary fines, the aims should be to preserve the environment by addressing the problem of climate change as well as to prevent diseases such as cancer that might harm the society, hence value creation.

2.7.1.3.1 Recycling

Recycling involves using a material that has been used in the production of certain products, to produce the same product or a new product in order to lessen environmental uncleanness and also to lessen the use of primary raw material. (Tanskanen, 2013). Companies involved in recycling should possess recycling attitudes inspired by diverse social-psychological elements such as knowledge, inspirational factors as well as pro-attitude towards recycling (Flagg & Bates, 2016; Ramayah & Rahbar, 2013). Recycling has the following benefits as outlined by the department of environmental affairs and tourism (South Africa) namely, it lessens the amount of waste that is taken to waste sites, creation of employment opportunities, a decrease in the amount of pollution, it helps reduce pollution and safeguarding of natural resources, it conserves energy preservation and manufacturing cost decline, the amount of littering deteriorates, it can lessen informal rescuing from waste sites. Also, recycling offers companies opportunities to recover valuable materials, and if companies have recycling programs in place, they benefit economically (Flagg & Bates, 2016; Tanskanen, 2013). However, not all waste can be recycled. Department of Environmental Affairs and Tourism (DEAT, 2005b) in South

Africa identifies waste that can be recycled and waste that cannot be recycled. Waste that can be recycled includes among others, metal cans, cardboard, paper, biodegradable plant waste, plastics, textiles, used oil, tyres, batteries, old appliances construction and demolition waste and car bodies and waste that cannot be recycled such as car windscreen and mirrors, general waste mixed with dangerous waste, laminates and recyclables that are very dirty (DEAT, 2005b). However, the responsibility for waste management lays solely with the manufacturer (Department of Environmental Affairs and Tourism (DEAT, 2005b). Hence, manufacturing companies should know how to deal with waste caused by their production activities and also how to deal with that waste when thrown away to avoid penalties and to care about the society living in that environment.

2.7.1.3.2. Use of renewable material

Using material that is renewable in the production process also promotes the prevention of pollution (Bhattacharya, Paramati, Ozturk & Bhattacharya, 2016). Renewable material includes the use of renewable energy derived from nature (DEAT,1990-1999a). Government supports the use of renewable material, and in support of such practices, it rewards with financial incentives such as rebates, tax credits and low-interest loans to those companies practising it (Payne, 2012). For those companies which do not practice the use of renewable material and negatively impact the environment, the government have fines in place. Among the reasons for government to impose fines for waste and pollution caused by production activities and compensate those companies which manage pollution are that manufacturing companies should become cautious and considerate when it comes to the issue of the design of the product, product packaging

and the choice of material used for manufacturing products (DEAT, 1990-1999a). Additionally, the South African government is devoted to encouraging renewable energy sources that are clean through employing special tariffs for renewable electricity generation through a modest process of bidding (Republic of South Africa National Treasury, 2013). Dixon-Fowler, Slater, Johnson Ellstrand and Romi (2013) assessed the association between the use of renewable energy and firm performance and found a positive relationship. In contrast, Trainer (2017) examined some problems in storing renewable energy and found some drawbacks that there are major limitations on the 100% renewable supply systems. Hence, manufacturing companies should try to promote the use of renewable energy to reduce greenhouse gas emissions in order to protect the health of the society as well as to save money. In other words, the impact on the environment will be minimal.

2.7.1.3.3 Green economy

Investing in green activities leads to a green economy. Green economy helps to decrease poverty rate by creating jobs as people earn money enabling them to purchase basic needs and it prevents natural resources degradation from widening the poverty trap since, poor people rely on natural resources such as forestry and fishing for survival (Zeb, Salar, Awan, Zaman and Shahba, 2014). Furthermore, customers are more interested in companies that prove to be environmentally aware and implement sustainability practices as represented by environmental awareness (DiPietro, Cao & Parlow, 2013). DiPietro *et al.* (2013) found that customers are aware of green practices and customers' intentions of knowing more about this practices are growing and also that customers' green

practices at home motivate customers to associate with companies that produce products that safe to the environment and those intentions. Moreover, Martin and Moser (2016) found that potential investors bid higher for companies if disclosure about green investment is made than if they do not disclose. Hence, manufacturing companies should manufacture a green product, that does not harm the environment so as not to harm the society living in it. Furthermore, since customers are aware of green products, sales will increase, and that will lead to a green economy.

2.7.1.4 Green certification

Green certification is a fourth type of green activity. For a product to prove to the customer that it is clean and for export purposes, it should pass green certification (Luan *et al.*, 2016). This implies that upon green certification companies obtains a green certificate. Green certificates need to be renewed each year as they expire (Ciarreta, Espinosa & Pizarro-Irizar, 2017). However, for companies to obtain this certificate, there are requirements (Ciarreta *et al.*, 2017). This implies that for a company to obtain a green certificate, there are specific standards to be met. For example, a company producing electricity should produce at least 50 000kwh of electricity which per year reaches a production level of 25 000kwh to obtain green certificates (Colcelli, 2012).

2.7.2 Components of green investments

This subsection discusses the components of green investments, namely, low-carbon manufacturing, energy efficiency and carbon sequestration.

2.7.2.1 Low-carbon manufacturing

Manufacturing companies' processes of production consume high energy, pollutes the environment and add to high carbon emissions and as such manufacturing companies need to up their game with regards to the implementation of low carbon manufacturing to solve the problem of high energy emissions and high energy consumption (Du, Yi, Li & Liao, 2015). Low-carbon emission involves companies producing items that are low in carbon through processes of manufacturing that are sustainable and that lessen the emission of carbon and the usage of energy (Muller & Bottcher, 2016). In other countries, such as Sweden and European Union countries, the carbon tax has been introduced to change industrial behaviour and encourage them to move to cleaner technology when renewing processes (Murray & Rivers, 2015; Van Heerden, Blignaut, Bohlmann, Cartwright, Diederichs, & Mander, 2016).

2.7.2.1.1 South African policies on low carbon

In South Africa, Department of Environmental Affairs highlights that the carbon tax must be imposed in respect of the sum of the greenhouse gas emissions of a taxpayer, in respect of a tax period expressed as the carbon dioxide equivalent of those greenhouse gas emissions resulting from fossil fuels combustion, in respect of that tax period that is a number constituted by the sum of the respective numbers determined for each type of fossil fuel in respect of which a greenhouse gas is emitted in respect of that tax period (Republic of South Africa National Treasury, 2013). However, taxpayers can reduce the amount of carbon tax by utilising carbon offsets as prescribed by the minister.

Additionally, the decline of the liability for the carbon tax allowed in terms of subsection (1) of South African Carbon tax, may not exceed so much of the percentage of the total greenhouse (Republic of South Africa National Treasury, 2013).

Moreover, the South African government has established wide-ranging policy frameworks that categorise change in climate as the main challenge (Republic of South Africa National Treasury, 2013). Additionally, initiatives for managing the move to a low-carbon and green economy are in place and ready to be actioned, and these need to be aligned to assist in addressing different environmental encounters, including change in climate (Republic of South Africa National Treasury, 2013). Due to environmental challenges, such as climate change, air and water pollution that occur when a specific volume of a specific environmental resource is overdone, the government in South Africa has therefore identified a need for carbon pricing (Republic of South Africa National Treasury, 2013). Among reasons for carbon pricing are that society become end-receivers of resulting pollution, and the polluter is repeatedly not held accountable for the costs of such pollution (Republic of South Africa National Treasury, 2013).

2.7.2.2 Energy efficiency

Energy is needed in order for companies' survival and improvement, leading to social, economic and environmental stability (Yang, Han & Wang, 2013). The issue of the convenience and affordability of energy is a critical problem, and it affects the manufacturing process, hence energy efficiency (Salonitis, 2015). Energy efficiency involves cutting down the use of energy input such as heating or cooling leading to better

organisational conditions (Kohler, 2014). There are three challenges related to energy that can be remedied through energy efficiency, namely, climate change, energy security and economic development (Bukarica & Tomsic, 2017). Energy efficiency wrestles these challenges to ease the burden of cost to society (Bukarica & Tomsic, 2017).

Additionally, for climate change mitigation, energy efficiency can be used as the main rule (Rajbhandari & Zhang, 2018). Furthermore, in their various processes, manufacturing sectors use a considerable amount of energy to attain operations which are more environmentally and economically sustainable (Kluczek, 2017). Moreover, industrial facilities consume an extensive amount of energy for cooling, space heating or maintaining for motors (Kolinski, 2012). However, there is a need for energy efficiency that can be enhanced by an extensive diversity of technical actions all the way through the industrial processes, as well as the confirmation of specific technologies and processes such as refurbishing equipment, replacing and retiring obsolete equipment, process lines to new and state of art technologies or using heat management to cut down heat loss and waste energy (Xue, Wu, Zhang, Dai & Su, 2015). Energy efficiency enhancements involve among others, the implementation of numerous measures of energy efficiency. Implementation of energy efficiency measures by industries enhances processes or systems of energy using technologies in industrial plants (Trianni, Cagno & Farne, 2016). If there are energy efficiency measures in place, as well as energy efficiency projects such as cost-effective technologies, energy performance can improve (Thollander, Backlund, Trianni & Cagno, 2013). However, the financial probability of those

energy efficiency projects should be guaranteed (Mangano, De Marco, Michelucci & Zenezini, 2016).

Furthermore, in guaranteeing the assurance of the financial capability of energy efficiency projects, manufacturing companies need to opt for sustainable funding mechanisms (Sun, Xuhong, Xie, 2014). Moreover, manufacturing companies should engage in energy consumption reducing projects in order to improve (Rosa & Ozolina, 2012; Lunt, Ball & Levers, 2014). Energy efficiency in South Africa has eight goals grouped as social sustainability goals, environmental sustainability goals and economic sustainability goals (Department of Minerals and Energy(DME) 2005). Therefore, for social sustainability, the goals are to, improve the health of the nation by lessening the atmospheric emission of substances considered harmful such as oxides of Sulphur, oxides of Nitrogen, and smoke. In addition to social sustainability, the goal is, to create jobs through the spin-off effects of energy efficiency implementation (Improvements in financial performance, and uplifting the energy efficiency sector itself, will inevitably lead to nationwide employment opportunities). Furthermore, another social sustainability goal is to lessen energy poverty through the ample provision of energy services to the community at an inexpensive cost (DME, 2005).

Additionally, the environmental sustainability goal aim is to reduce environmental pollution by lessening the local environmental impacts of its production and use and reduce CO_2 emissions (DME, 2005). Besides the goals for economic sustainability are to improve industrial competitiveness (DME, 2005). Furthermore, it has been found that one of the most cost-effective ways of capitalising on financial profitability is the implementation of

suitable energy efficiency measures (DME, 2005). Furthermore, another economic sustainability goal for energy efficiency is the improvement of energy security, this is, energy conservation will lessen the needed capacity of imported primary energy sources, crude oil to be exact, improve the strength of South Africa's energy security and will upsurge the country's resilience against external energy supply disturbances and price instabilities (DME, 2005). The last economic sustainability goal is to lessen the need for additional power generation capacity (DME, 2005).

Furthermore, the government in South Africa has implemented the Energy Efficiency and Demand-Side Management (EEDSM) programme, which discourses energy supply security via particular energy efficiency and renewable energy technologies (Republic of South Africa National Treasury, 2013). Also, the solar water heating framework is predominantly intended for households, whereas the anticipated energy-efficiency savings tax-incentive is meant for companies (Republic of South Africa National Treasury, 2013). Furthermore, these processes provide for a deduction against taxable income for confirmable energy efficiency savings and as such add drastically to energy efficiency and, indirectly, to GHG mitigation (Republic of South Africa National Treasury, 2013). Trianni, Cagno, Thollander and Blacklund (2013) highlights that, although manufacturing companies are urged to invest in energy efficiency, there are barriers such as the perception of the lack of resources to be devoted to improving energy efficiency and the existence of other priorities such as the importance of guaranteeing continuity of the business. Hence, manufacturing companies should invest and improve energy efficiency to reduce greenhouse gas emissions and to reduce air pollution caused by manufacturing

activities in order to protect the climate and the health of the environmental occupants, hence value creation. Apart from the abovementioned reasons, other reasons can be to avoid fines attached to emissions and pollution and to receive incentives for green investment practices.

2.7.2.3 Carbon sequestration

Carbon sequestration involves capturing atmospheric carbon and transforming it into a state of not affecting global warming (Nogia, Sidhu, Mehrotra & Mehrotra 2016). Carbon sequestration can either be biologically performed by living organisms such as plants which result in carbon capture and storage using different processes, and non-biological sequestration includes ocean sequestration through fertilisation and terrestrial sequestration or non-biological (Nogia *et al.*, 2016). Additionally, there are carbon sequestration technologies such as carbon capture and storage(CCS) that involve keeping important greenhouse gas out of the air and leads to benefits and trade-offs for air pollution (Zhou, Li, Guo & Li, 2017). Hence, South African manufacturing companies should either engage in carbon-negative activities or store carbon mainly to protect the climate from being destroyed

2.8 Summary of the chapter

This chapter discussed the theoretical framework underpinning this study. King Code IV on corporate governance, SR, SR and stakeholder value creation were discussed. Furthermore, the literature on employees' health and occupational safety, community projects, green investments and their impact on ROA were discussed. The next chapter

discusses the research methodology comprising of research designs, research methods, target population, sampling and data analysis for this study. Reliability and validity, ethical considerations, limitations and significance of this study will be outlined in the next chapter.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

The previous chapter discussed theoretical framework and literature on SR, sustainability reports, sustainability reports and stakeholder value creation, employees' health and occupational safety expenditure, community projects, green investments and ROA. This chapter discussed the overall research methodology for this study. Section 3.2 discussed the research design and Section 3.3 discussed the research paradigm. Section 3.4, 3.5, 3.6 and 3.7 discussed the research method, data collection approach, target population and sampling respectively. Section 3.8 defined the variables used in this study. Section 3.9 discussed data analysis. Section 3.10 discussed reliability and validity, and it is subdivided into two. Section 3.11, 3.12 and 3.13 discussed ethical consideration, limitation of the study and significance of the study respectively.

The research methodology is a technique employed by the researcher to convey the study project, and it outlines specific tools the researcher chooses (Leedy & Ormrod, 2005). Welman, Kruger and Mitchell (2010) specified that the research methodology considers and explains the logic behind research methods. Research methodology

stresses the approaches and instruments to be used throughout the study process. The next subsection explains the research design adopted for the study.

3.2 Research design

Research design is a plan of how the research is to be carried out (Wiid & Diggines, 2013). Additionally, a research design constitutes the strategy for collection, measurement and analysis of data. The objective of this study is to measure the relationship between employees' health and occupational safety and ROA, community projects and ROA and green investment and ROA. Employees' health and occupational safety, community projects and green investments are independent variables, and ROA is the dependent variable. This study, therefore, seeks to determine the effect that these three independent variables have over ROA. This study adopted a non-experimental design called correlational research design.

3.2.1 Correlational research design

Correlational research design is quantitative. This research design is appropriate for this study because it measures the relationships between variables. Hence this study measured the relationship between variables, namely, employees' health and occupational safety and ROA, community projects and ROA and green investment and ROA. Quantitative methods highlight unbiased measurements and statistical, mathematical or numerical analysis of data gathered over polls or by manipulating previous statistical information using computational system (Babbie & Mouton, 2010b). A quantitative approach is, therefore, a research approach that makes use of numbers and

figures. Quantitative research aims to assess objective data comprising of figures and to further comprehend the facts of a research project from the views of other people (Creswell, 2012).

Furthermore, correlational research design estimates the degree to which a change in one variable can lead to a change in the other variable (Welman, Kruger & Mitchell, 2010). Correlational research design explains the relationship between variables, and it is necessary when attempting to relate variables in checking if one variable influences the other (Creswell, 2012; Curtis, Comiskey & Dempsey, 2015). Also, this research design can be used when the researcher knows and can apply statistical knowledge based on calculating the statistical correlation tests (Creswell, 2012). Furthermore, employing a correlational research design can either reveal a positive or negative relationship between variables tested (Welman *et al.*, 2010). Additionally, Van De Voorde and Beijer (2015) used correlational research design to test the relationship between high-performance work systems and employee outcomes represented by human resource attributions, levels of commitment, levels of job strains, high-performance work system practices and human resources performance attributions. Hence, this study used a correlational research design to test the relationships between employees' health and occupational safety and ROA, community projects and ROA and green investment and ROA.

3.3 Research paradigm

Since the quantitative research method is used, this study adopted a positivist paradigm. A positivist research paradigm is aimed at scrutinising, confirming a law-like behaviour

pattern and is used to test theories and hypothesis (Taylor & Medina, 2013). Also, positivists hold that research must be limited to what we can observe and objectively measure (Welman *et al.*, 2010). In positivist research, experimental designs are used to measure the effects of one variable over other variables (Antwi & Hamza, 2015). Positivists emphasise that research methods should be valid and reliable in order to describe and explain events (Antwi & Hamza, 2015).

Positivist research has some advantages. Firstly, there is extensive use of large samples, which could be used to make a generalised conclusion for the whole population. Secondly, using experimental laboratory research designs, survey methods and demanding statistical methods of analysis could ensure reliable empirical evidence. Thirdly, good positivist research is replicable, where two or more researchers could undertake the same research in the same way and come up with similar if not comparable results. Finally, during data collection and data analysis, the researcher's independence and that of the object being studied could be warranted complete objectivity (Ismail & Zainuddin, 2013).

3.4 Research method

The quantitative research method was chosen over qualitative research method in this study because variables, namely, employees' health and occupational safety, community projects, green investment and ROA were measured in rands and in numbers, hence, quantitative research method collects numeric data and measure the correlation between variables. Qualitative research method addresses a research problem in which the

researcher does not know about the variables (Creswell, 2012). Additionally, a qualitative research method is characterised at the stage of research when the researcher, among others, wants to explore a problem and develop an understanding of a central phenomenon and collects data based on words from a small number of individuals so that all participants' views are obtained (Creswell, 2012.

However, these two research methods namely, qualitative and quantitative, have some similarities such as the steps to be followed in the research process and data collection procedures and others (Creswell, 2012). Hence this study used quantitative method and data collected were secondary. Among the differences between these two methods, is the method of analysing data collected. In qualitative research, data is analysed using inquirer analyses words or images other than in quantitative research where data is analysed using statistical software in the form of numbers. (Creswell, 2012). Quantitative research method's characteristics are, among others, researcher's need for an explanation of the relationship among variables, providing a major role for the literature by suggesting questions to be asked, creating the purpose statements and hypotheses that are specific, measurable and observable, collecting numeric data from a large number of people and testing the correlation between variables using statistical analysis (Creswell, 2012).

In this study, the relationship between SR and stakeholders value creation, represented by ROA as dependent variable and employees' health and occupational safety, community projects expenditure and green investments as independent variables is examined. Hence, ROA represents stakeholder value. Besides Nyirenda, Ngwakwe and

Ambe (2013) used the quantitative approach when they examined the relationship between environmental management practices and performance of a mining company. In testing the two variables, regression analysis was adopted. Godfrey, Scott, Difford and Trois (2012) also used quantitative approach-regression analysis in measuring the relationship between corporate data and resultant knowledge. Furthermore, Sinthupundaja and Chiadamrong (2017) also used a quantitative approach, that is regression analysis in investigating the determinants of Thai manufacturing public companies' performance. Additionally, Rodriguez-Fernandez (2016) used a quantitative approach- regression analysis in testing the relationship between corporate environmental responsibility and firm performance. The adoption of regression analysis for this study was relevant, and it helped the researcher to test the correlation between employees' health and occupational safety and ROA, community projects and ROA and green investment and ROA.

3.5 Data collection approach

This study used secondary data because the information needed was already published and were used by other researchers for primary purposes. Data were collected from published manufacturing companies' annual integrated reports and sustainability reports that were readily available through the company's websites and the IRESS Database. Additionally, internet search was conducted for keywords such as sustainability reporting, stakeholder value creation, employees' health, occupational safety, community projects, corporate social responsibility, green investments and other related terms in collecting more information relating to SR and stakeholder value creation. Secondary data are data

that are already collected by someone or institution other than the researcher him/herself, for another primary purpose (Johnston, 2014). Secondary data offer advantages such as cost-effectiveness, convenience and methodological benefits (Smith, Ayanian, Covinsky, Landon, McCathy, Wee & Steiman, 2011). James (2015a) collected data and facts from annual reports and sustainability reports published by companies as well as an internet search for keywords such environment, community involvement, sustainability, corporate social responsibility and other terms relating to SR. Kakakhel, Ilyas, Iqbal and Afeef (2015) also used secondary data obtained from annual reports of sampled companies in measuring the impact of CSR on firm performance. The researcher used a period of eleven years ranging from 2007 to 2017.

3.6 Target population

In this study, the population was all JSE listed manufacturing companies in South Africa because unlike unlisted companies, listed companies publish their financial statements and reports which are audited and which meet the requirements for JSE listing. The population is defined as a group of potential participants from whom we want to generalise the results of a study (Van Zyl, 2012). The researcher used manufacturing companies as the target population for this study because listed JSE companies' information is publicly available.

3.7 Sample and sampling

Sampling helps a researcher to obtain an acceptable sample. Kohtala (2014) defined a sample as a constituent of a larger population to which a study's findings will be applied.

In this study, twenty-six (26) manufacturing companies listed in the JSE were sampled. Sampling has two methods; probability and non-probability sampling. Probability sampling is a method that collects samples methodically to offer all the individuals in the population equal chances of being selected (Kohtala, 2014). Non-probability sampling involves samples being selected based on a researcher's subjective judgement. Purposive sampling is a type of non-probability sampling. This study used purposive sampling to select the sample size. Purposive sampling is adopted as the researcher focused on the manufacturing companies. The manufacturing companies were sampled from different sectors: food producers, beverages, forestry and paper, tobacco, oil and gas and general industrials. The 26 sampled manufacturing companies listed on the JSE SRI are as follows:

- ACL
- ANH
- ARL
- AVI
- BAT
- BAW
- CKS
- CLR
- DIST
- EEL
- ENX

- GRF

- KAP

- MNP

- OAO

- OCE

- PBF

- PFG

- QFH

- RCL

- REM

- RFG

- SAP

- TBS

- TON

- YRK

3.8 Variables definition and data sources

The dependent variable is the ROA while the independent variables are employees' health and occupational safety expenditure, investment in community projects and green investments.

The model used for this study is a regression equation stated as follows:

Restating the regression equation, we have the following models:

$$ROA = \alpha + \beta_1 OHSEXP_{1it} + \beta_2 COMPRJEXP_{2it} + \beta_3 GREENINV_{3it} + \beta_4 OPERPROFIT_{4it} +$$
$$\beta_5 DEBTEQUITY_{5it} + \varepsilon \qquad (1)$$

Where:

ROA = Return on Assets

$\beta_1 OHSEXP_{1it}$ = employees' health and occupational safety

$\beta_2 COMPRJEXP_{2it}$ = Community projects expenditure

$\beta_3 GREENINV_{3it}$ = Green investments

$\beta_4 OPERPROFIT_{4it}$ = Operating profit

$\beta_5 DEBTEQUITY_{5it}$ = Debt-equity

ε = the error term controlling for any omitted variables

3.8.1 Dependent variable

In this study, ROA was used as a value creation variable. Value creation is the company's ability to make added value to inputs it received. As such, value creation is depicted as a measure of the ability of management to improve the financial performance of the company. There are many ratios in profitability and among others are gross profit percentage on sales, gross profit percentage on the cost of sales, net profit percentage

on sales, net profit percentage on the cost of sales, return on equity, ROA, return investments and others. The researcher used ROA as a dependent variable in this study. ROA was considered a true measure of profitability because other researchers such as Kabajeh *et al.*, (2012) have used ROA in measuring profitability by examining the relationship between ROA, ROE and ROI. Siminica, Circiumaru and Simion (2012) used ROA as a dependent variable to test its correlation to the measures of profitability. Alghifari, Triharjono and Juhaeni (2013) also used ROA in examining its effect on Tobin's Q. Furthermore, Dewi, Sudarma, Djumahir and Eko (2014) used ROA as a variable to examine how it is affected by CSR. This ratio is calculated as net profit after tax divided by the total assets. This ratio measures the operating efficiency for the company based on the companies' generated profits from its total assets (Kabajeh, AL Nu'aimat and Dahmash, 2012).

3.8.2 Independent Variables

Independent variables consist of employees' health and occupational safety, community projects and green investments.

3.8.3 Employees' health and occupational safety

Employees health and occupational safety entail provision and maintenance of a safe working environment without risk to the health and safety of the employees by employers (South African Government Gazette, 1990-1999). Employees health and occupational safety is an important social variable because companies need to be socially accountable to all stakeholders including its employees in order to strive for sustainability (Sodhi,

2015). Being socially responsible include engaging in health promotions and taking occupational safety measures at workplaces. Employees are also stakeholders, and when manufacturing companies take health and occupational safety issues seriously, they fulfil their social accountability resulting in employees feeling valued. Reimann and Guzy (2017) focused on psychological contract breach and employee health and used employees' health as one of the variables. This study also used employees' health and occupational safety as one of the variables.

3.8.4 Community projects

Community projects involve a company binding itself to use its resources in order for the society to benefit (Dewi *et al.*, 2014). Rhou *et al.*, (2016) asserts that companies should engage in CSR activities such as community projects since the focus is no longer on financial performance. In this study, the relationship between SR and stakeholder value creation was measured. Value creation involves companies endeavouring to produce social results to fulfil stakeholders' expectations and thus the development of a relationship with stakeholders and that could be achieved through engagement in community projects. Hence, this study used community projects as one of the independent variables.

3.8.5 Green investments

Green investment involves companies proving to their customers that their products are clean and do not harm the environment (Luan *et al.*, 2016). In this study, the relationship between sustainability reporting and stakeholder value creation is measured. Amongst

company stakeholders, we have investors and customers. Investors and customers prefer being associated with companies that evaluate and monitor practices that do not harm the natural environment (Griffin & Sun, 2013). Engaging in green activities was considered the creation of value to investors and customers as it minimises the harm caused to the environment. Hence this study used green investment as one of the independent variables. Additionally, stakeholder theory highlights that if a company includes the natural environment as one of the important stakeholders sideways with green investments, it promotes corporate environmental initiatives.

3.8.6 Control variables

Measuring the relationship between SR and stakeholder value creation alone could not justify the findings from this study and that necessitated the use of control variables. A control variable aims to control for factors that may influence the regression results. Nyirenda *et al*. (2013); Saeidi, Sofian, Saeidi, Saeidi and Saaeidi, 2015; Chen, Ong and Hsu, 2016; Maleka, Nyirenda and Fakoya, 2017 also used control variables. There are many determinants of ROA that can be used as control variables such as liquidity ratios, assets management ratios, debt management ratios, debt-equity ratios, operating expenses ratios and many others (Rosikah, Dwi, Dzulfikri, Muh-Irfandy, Miswar, 2018). This study, therefore, used operating profit margin and debt-equity ratio as control variables because they can affect profitability(ROA) and they are explained below.

3.8.6.1 Operating profit margin

Operating Profit Margin is a performance ratio used to determine the proportion of profit a company yields from its operations, before subtracting taxes and interest charges. It is calculated by dividing the operating profit by total revenue (Operating Profit Ratio = Operating Profit divided by Net Sales multiply by 100) (Tulsian, 2014). Prior researchers such as Tulsian (2014) used operating profit margin as a variable to determine the operational efficiency of the management. This study measured the relationship between SR and stakeholder value creation using operating profit margin as one of the control variables because it can affect ROA.

3.8.6.2 Debt-equity ratio

The debt-equity ratio is a ratio used to measure a company's ability to pay its debts (Kamar, 2017). In checking the company's ability to pay its debts, a comparison is made between the total debts and the entire equity by dividing the total liabilities with shareholders' equity (Kamar, 2017). Prior researchers such as Gupta (2016) focused on capital structures practices in industries and used the debt-equity ratio as a variable. Furthermore, Velnampy and Niresh (2012) also used the debt-equity ratio as a variable in measuring the relationship between capital structure and profitability. This study measured the relationship between SR and stakeholder value creation using the debt-equity ratio as one of the control variables because, like operating profit, it can affect ROA.

3.9 Data analysis

In this study, data collected were analysed using the multiple linear regression analysis (MLRA). The purpose of MLRA is to find the relationship between the dependent and independent variables (Gujarati, 2004). MLRA was considered appropriate in this study as the relationship between the dependent variable and independent variables was measured. Xie, Jia, Meng and Li (2017) focused on CSR, customer satisfaction and financial performance and used ROA, ROS and CSR as variables. Regression analysis was used in their study. Munshi and Dutta (2016) conducted a comparative analysis of the quality of SR in Indian and American manufacturing companies and used multiple regression analysis. The STATA 15 software was used to perform the analysis. STATA was chosen over other statistical software because of its user interface, data structure, data format compatibility, extensibility, user community and timeliness of release. Muhammad, Scrimgeour, Reddy and Abidin (2015) measured the relationship between environmental performance and firm performance and used STATA to analyse data. Quantitative data analysis involves determining how to assign numeric scores to the data, testing the score types to be used, selecting the statistical program to be used and inputting data into the statistical program and cleaning up the database for analysis (Creswell, 2012).

3.10 Reliability and validity

This section explained the reliability and validity of the data and the method of analysis.

3.10.1 Reliability of data

Reliability measures consistency (Creswell, 2012). According to Creswell (2012), scores need to be reliable in order to be valid. Also, reliability helps to assess the goodness of a measure (Sekaran & Bougie, 2016). In ensuring the reliability of data in this study, sources of data were collected only from companies' websites and IRESS database which was considered to be reliable. Since people other than the researcher collected the data used in this study for other purposes, it is considered reliable.

3.10.2 Reliability of research method

To ensure the reliability of data analysis in this study, the researcher used quantitative approach and MLRA because we are looking at the relationship between multiple independent variables against one dependent variable. Furthermore, other researchers such as Godfrey *et al.* (2012), Nyirenda *et al.* (2013), Rodriguez-Fernandez (2016) and Sinthupundaja and Chiadamrong (2017) relied on quantitative research approach in their studies. The researcher analysed data using MLRA to find the relationship between variables as other researchers such as Muhammad *et al.* (2015), Munshi and Dutta (2016) and Xie *et al.* (2017) also relied on MLRA in their studies. Luan *et al.* (2016) also used regression analysis to test the impact that green activities have on firm performance. Rhou *et al.* (2016) focused on the relationship between CSR and firm performance and relied on multiple linear regression for data analysis.

3.10.3 Validity of data

To ensure the validity of data in this research, only published information about listed manufacturing companies and information from IRESS database was used. IRESS database information is hoped to be valid and therefore other researchers can use data from this research. Validity is the development of evidence sound enough to demonstrate that there is a match between the interpretation of the tests and its proposed use (Creswell, 2012). Also, validity is the more encompassing term when testing the instrument chosen (Creswell, 2012). For a researcher to ensure the validity of data used, the appropriate time frame should be selected. The researcher selected the time frame 2007 to 2017 (eleven years) because of data availability and that any amendments to legislation and regulations about sustainability and stakeholder value creation may have been considered. The researcher, therefore, made conclusions and recommendations relevant to manufacturing companies based on the latest research.

3.10.4 Validity of research method of analysis

This study aimed at measuring the relationship between variables which necessitated the adoption of correlational research design. Correlational research design is quantitative. Hence this study used a quantitative research method which also measures relationships between variables. Researchers such as Godfrey *et al.* (2012), Nyirenda *et al.* (2013), Rodriguez-Fernandez (2016) and Sinthupundaja and Chiadamrong (2017) used quantitative research approach and as such this proves the method used in this study to be valid. Furthermore, as stated that the purpose of this study was to find the relationship

between variables, it necessitated the use of MLRA, hence the purpose of MLRA is to find the relationship between independent and dependent variables. Researchers such as Muhammad *et al.* (2015), Munshi and Dutta (2016) and Xie *et al.* (2017), used the same methods as the methods employed in this study and that proves validity.

3.11 Ethical considerations

Since there was no physical contact with participants and secondary data used in this study were collected by other researchers for primary purposes, there was no need for ethical clearance from Turfloop Research and Ethics Committee (TREC). Additionally, since data used in this study were obtained from published manufacturing companies' annual integrated reports and sustainability reports that are publicly available through the company's websites and the IRESS database, which is not protected by copyright, the researcher did not in any way exploit any information for personal gains. The researcher respected companies under study and exercised academic confidentiality by not reporting any information damaging to operations of any of the companies under study. The researcher further acknowledged the resources used and employed suitable methods of referencing.

3.12 Limitation of the study

The study was limited to a sample of 26 manufacturing companies listed on the JSE in South Africa. However, manufacturing companies operating but not listed on the JSE in South Africa were excluded to arrive at the generalisation of the result. The study used correlational research design and quantitative research methods in testing the

relationship between variables. The multiple linear regression was used to analyse data collected from a sample of 26 manufacturing companies for 11 years. Other researchers can arrive at different results by adopting different approaches, designs, methods of analysis and variables that this study did not use.

3.13 Significance of the study

This study might help the academia, industry and society in the following manner:

3.13.1 Academia

This study might add to the existing body of knowledge and literature on SR and stakeholder value creation and might also pave ways for future studies in the field of SR and stakeholder value creation, employees' health and occupational safety and ROA, community projects and ROA and green investments and ROA.

3.13.2 Industry

The intentions of this study were to examine SR and stakeholder value creation in South African manufacturing companies listed at JSE using variables: employees' health and occupational safety, community projects, green investments and ROA. This study might help manufacturing companies to implement sustainability initiatives such as employees' health and occupational health, community projects and green investments that will lead to improved company performance and contribute to reducing companies' environmental impact. When manufacturing companies promote health and safety in workplaces, employees will feel valued and that will result in manufacturing companies being able to

retain those hardworking employees and productivity will grow. Furthermore, manufacturing companies' engagement in community projects and green investment might lead to gaining trust and loyalty from the society and customers leading to high sales and good returns, hence sustainability. This could be achieved by understanding the relationship that employees' health and occupational safety, community projects and green investments have on company performance as represented by ROA. Furthermore, this study might enable those manufacturing companies in South Africa already engaged in health and safety initiatives, community projects and green activities to identify areas which need attention or which need to be improved or strengthened. Additionally, this study might help manufacturing companies which have always been clueless about the importance of employees' health and occupational safety, community projects and green investments and at the same time losing money and performing bad financially.

3.13.3 Society

When companies can implement and improve sustainability initiatives such as community projects, society gains in the form of employment opportunities and improved standard of living. Due to the high rate of unemployment in South Africa, some members of society might benefit. Furthermore, when manufacturing companies can minimise or control the environmental harm caused by their production activities, society benefits. Some members of the society depend on fishing and agriculture to feed families, and as such, the lesser the environment is damaged, the better. Findings of this study might help the society understand the operations of manufacturing companies when it comes to the issue of sustainability initiatives.

3.14 Chapter Summary

In this chapter, the research methodology was discussed. The research design and methods used to achieve the objectives of this study were discussed. The research design selected for this study is quantitative and non- experimental using secondary data and regression analysis as the method of analysing data. This chapter further discussed the target population where it was indicated that only purposefully sampled manufacturing companies were targeted for this study, sampling where it was indicated that the researcher used purposive sampling, data collection method which indicated that the researcher used secondary data, validity and reliability of data and method of analysis where the researcher indicated the use of data from IRESS and MLRA for data analysis. Limitations of the study, significance of the study and ethical considerations were also outlined in this chapter. The next chapter comprises of data analysis and discussions.

CHAPTER FOUR: DATA ANALYSIS AND DISCUSSION

4.1 Introduction

In the previous chapter, the research methodology was discussed. The research design, research paradigm, research method, data collection approach, population, sample and sampling, the definition of dependent, independent and control variables, sources of data, data analysis reliability and validity were discussed in the previous chapter.

This chapter discusses the analysis of data and results based on the hypothesis. STATA 15 was used to analyse the data as indicated in the previous chapter.

4.2. Panel Data Analysis

Secondary data used for analysis in this study were obtained from listed manufacturing companies' annual integrated reports as published on their websites and some data were obtained from the IRESS database. Data were presented in the form of a worksheet as included below. In analysing the relationship between community projects and ROA, employees' health and occupational safety and ROA, green investment and ROA, STATA 15 was employed. Operating profit margin and debt-equity ratio were used as control variables in this study.

4.3. Statistical models and tests

This section presents descriptive statistics test, two sample t-tests, regress test and Durbin-Watson tests. It further discussed scatter plots, Breusch- Pagan tests,

Multicollinearity tests, covariance matrix, correlations matrix, Durbin's alternative test and Breusch-Godfrey LM test. Additionally, the Shapiro-Wilk-W test, fixed effects, random effects and Hausman fixed were discussed.

4.3.1. Descriptive statistics

This section presents the result of the descriptive statistics. The descriptive statistic gives the researcher an idea of the distribution of data.

Table 4. 1: Summary of the descriptive statistics on energy usage

Variable	Obs	Mean	Std. Dev.	Min	Max
ROA	286	7.923811	13.08794	-86.07	50.1
Change in fatalities	286	2.007357	6.212652	0	74
Amount invested in community project	286	21276.06	55432.75	0	625300
Change in fossil fuel energy	286	10744.74	2028164	-25500000	22500000
Operating profit margin	286	-57.9052	1154.404	-19470.26	1122.42
Debt/equity ratio	286	1.067657	1.746837	0	20.59

Source: Authors' results of descriptive statistics from Stata 15 (2019)

Table 4.1 shows that the number of annual integrated reports observed was 286 for 26 JSE listed manufacturing companies sampled from food production, beverages, forestry and paper, tobacco, oil and gas and general industrials over 11 years. The mean for ROA as a dependent variable was 7.923811 whereas the mean for independent variables change in fatalities, amount invested in community projects, changes in fossil fuel energy were 2.007357, 21276.06 and 10744.74 respectively. Moreover, the mean for control variables, operating profit margin and debt-equity ratio were -57.9052 and 1.067657 respectively. This result shows that ROA has the most robust growth rate as compared with the change in fatalities and debt-equity ratio in JSE listed manufacturing companies

for the period 2007 to 2017. However, the operating profit margin has the most robust growth rate compared with ROA, change in fatalities and debt/equity ratio.

Standard deviation measures the spread of variables from the average mean. Results showed ROA as 13.08794 whereas for independent variables, change in fatalities, the amount invested in a community project and change in fossil fuel energy, the standard deviations were 6.212652, 55432.75 and 2028164 respectively. Additionally, for control variables, operating profit margin and debt/equity ratio, standard deviations were 1154.404 and 1.746837. Standard deviation is considered widely spread if it is more than the mean. Table 4.1 above shows a standard deviation of 13.08794 which is more than the average mean of 7.923811 for ROA. This means that ROA widely spread.

Additionally, the standard deviation for change in fatalities is 6.212652 which is more than the mean of 2.007357. This means that the change in fatalities is widely distributed. The standard deviation for the amount invested in a community project is 55432.75, and the mean is 21276.06. In the same vein as ROA and change in fatalities are widely spread, the amount invested in community projects is widely spread. Change in fossil fuel energy shows standard deviation and mean of 2028164 and 10744.74 respectively. Change in fossil fuel energy is therefore widely spread.

Furthermore, the operating profit margin shows a standard deviation and mean of 1154.404 and -57.9052 respectively. Operating profit is therefore widely spread. Lastly, the debt/equity ratio has a standard deviation of 1.746837 more than the mean of 1.067657 which implies that debt/equity ratio is widely spread.

Table 4.1 above further showed the minimum and maximum for dependent variable ROA to be -86.07 and 50.1 respectively while it showed the minimum for independent variables, change in fatalities, amounts invested in a community project and change in fossil fuel energy as 0, 0 and -25500000 respectively. These figures represent the least value of data for independent variables. Also, the maximum for independent variables were 74, 625300 and 22500000 respectively. These figures represent the maximum value of data in this series of independent variables. Moreover, the minimum for control variables, operating profit margin and debt-equity ratio were -19470.26 and 0. These figures represent the minimum value of data in this series of control variables. The maximum for control variables were 1122.42 and 20.59 respectively. These figures represent the maximum value of data in this series of control variables. The next section discusses the two-sample t-test results.

4.3.2. Two-sample *t-test*

This section presents the two-sample t-test. The two-sample t-test is used for evaluating the means of two or more variables.

Table 4. 2: Two-sample test

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
Operating profit margin	286	-57.9052	68.26133	1154.404	-192.266	76.45515
Debt/equity ratio	286	1.067657	0.103293	1.746837	0.864344	1.270971
Combined	572	-28.4188	34.12313	816.1065	-95.4409	38.6034
Diff		-58.9728	68.26141		-193.047	75.10177

diff = mean(operatingprofi~n) - mean(debtequityratio)   t = -0.8639
                    Ho: diff = 0   degrees of freedom =   570

Table 4.2 above shows results of two-sample t-test. Five hundred and seventy-two (572) combined observations for control variables were carried out. The results showed that operating profit had a negative effect (-57.91± 68.26) as compared to debt-equity ratio (1,07± 0.10). This shows that the control variables do not influence each other and are normally distributed. The next section discusses regression test results.

4.3.3 Regress

This section presents regression analysis test results for estimating the relationship between a dependent and independent variable.

Table 4. 3: The Regress Table

Source	SS	Df	MS	Number of obs	=	286
				F(5, 280)	=	5.9
Model	4651.383	5	930.2766	Prob > F	=	0
Residual	44167.46	280	157.7409	R-squared	=	0.0953
				Adj R-squared	=	0.0791
Total	48818.84	285	171.2942	Root MSE	=	12.559

ROA	Coef.	Std. Err.	T	P>t	[95% Conf.	Interval]
Change in fatalities	0.418999	0.144802	2.89	0.004	0.13396	0.704038
Amount invested in community project	0.00000975	0.0000162	0.6	0.549	-0.000022	0.0000417

	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
Change in fossil fuel energy	-0.000000189	0.00000037	-0.51	0.61	-0.000000917	0.000000539
Operating profit margin	0.002336	0.000645	3.62	0	0.001067	0.003605
Debt/equity ratio	-0.25992	0.428485	-0.61	0.545	-1.10338	0.583546
_cons	7.290175	0.918456	7.94	0	5.48222	9.098131

Source: Authors' results of Regress test from Stata 15 (2019)

Table 4.3 shows the regression results of variables. P-value is set at 0.05 meaning that any value less than 0.05 is considered significant. Change in fatalities shows a p-value of 0.04 which is less than 0.05. Change in fatalities is, therefore, a significant variable to explain ROA. The coefficient for change in fatalities is a positive 0.41899 meaning that a positive change in fatalities will result in positive change in ROA. Amount invested in community project shows a p-value of 0.549 which is higher than 0.05. Therefore, the amount invested in a community project cannot be used to explain ROA. However, the coefficient for this variable is a positive 0.00000975.

P-value for change in fossil fuel energy is 0.61 which is more than 0.05. In the same vein as the amount invested in community projects, changes in fossil fuel energy cannot explain ROA. Change in fossil fuel energy shows a coefficient of -0.000000189 which implies that change in fossil energy will affect ROA negative. Operating profit is a significant variable to explain ROA with a p-value of zero. The coefficient for operating profit shows a positive 0.002336 which means that an increase in operating profit will increase ROA. The debt-equity ratio has a p-value of 0.545 which more than 0.05. This implies that the debt-equity ratio cannot explain ROA. Table 4.3 above further shows the

coefficient of -0.25992 which means that an increase in the debt-equity ratio will result in a decrease in ROA.

The null hypothesis for regression results states that independent variables joined together cannot affect the dependent variable. The alternate hypothesis states that independent variables joined together affect the dependent variable.

Probability is set at 0.05 and any value more than 0.05 fails to reject null. Table 4.3 above shows a p-value of 0 which shows that all variables jointly affect ROA. Therefore, the alternate hypothesis is accepted, and the null hypothesis is rejected. R squared shows 0.0953. This implies that 9% (0.09) of variations in ROA can be explained by independent variables jointly. The remaining 81% (100-9) can be explained by other variables not mentioned in this model. Therefore, 81% represent error terms or independent variables not mentioned as more variables can explain ROA. The next section discusses the Durbin-Watson d-statistic.

4.3.4 Durbin-Watson d-statistic

This section presents the Durbin-Watson d-statistics. Durbin-Watson d-statistic test is performed on panel data analysis to test autocorrelation between independent variables.

Table 4. 4: Durbin-Watson d-statistic

Durbin Watson d-statistic (6, 286) = 1.023012

Source: Authors' results of Durbin-Watson d-statistic from Stata 15 (2019)

Table 4.4 shows a probability of 1.023012 for the residuals. The Durbin Watson test reports a test statistic, with a value from 0 to 4, where 2 is no autocorrelation, 0 to <2 is positive autocorrelation, and >2 to 4 is negative autocorrelation. The probability in Table 4.4 above indicates that there is a positive correlation between independent variables. The next section presents the scatter plot. Although there are variables that may influence ROA that were not included in the model, this is because the objective of the study is not to specifically examine those conventional variables that affect ROA rather examine whether sustainability indicators/variables could influence ROA within the selected manufacturing companies.

4.3.5 Scatter plot

The figure below is called a scatter plot. Scatter plots show the relationship between independent variables and dependent variable.
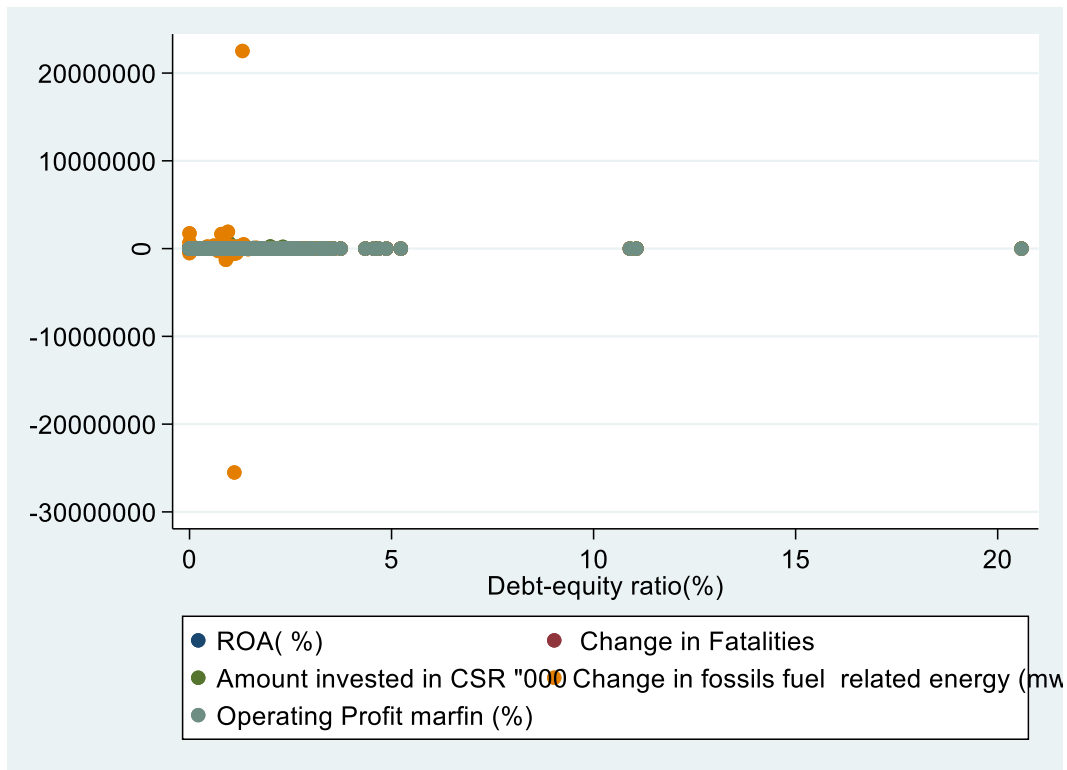
Figure 4. 1: Scatter plot

Source: Authors' results of Scatter Plot from Stata 15 (2019)

Figure 4.1 above does not indicate a clear relationship between independent variables and dependent variable since there is no linear pattern that connects any of the independent variables to dependent variable, therefore, it shows that there is a negative correlation between the variables. The next section discusses the Breusch-Pagan / Cook-Weisberg test for heteroskedasticity.

4.3.6 Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

This section presents the Breusch-Pagan test results. Breusch-Pagan test is used to test for heteroskedasticity in a linear regression model.

Table 4. 5: Breusch-Pagan test

Ho: Constant variance
Variables: fitted values of ROA
chi$^{2(1)}$ =   0.09
Prob > chi^2 =   0.7685

Source: Authors' results of the Breusch-Pagan / Cook-Weisberg test for heteroskedasticity from Stata 15 (2019)

Null hypothesis: Residuals are homoscedastic; Alternate hypothesis: Residuals are heteroscedastic. Table 4.5 above shows H$_0$ to have constant variance. It further shows a chi$^{2(1)}$ of 0.09 and a probability of 0.7685 which is greater than a p-value of 0.05. This means that residuals are homoscedastic. The null hypothesis is therefore accepted, and the alternate hypothesis is rejected. The next section presents the Multicollinearity test.

4.3.7 Multicollinearity test

This section presents the Multicollinearity test. Multicollinearity test measures the correlation between independent variables to measure if they can be used with dependent variables or not. (Yoo et al., 2014)

Table 4. 6: Multicollinearity test

Variable	VIF	1/VIF
Amount invested in a community project	1.46	0.683569
Change in fatalities	1.46	0.683906
Change in fossil fuel energy	1.02	0.983597
Debt/equity ratio	1.01	0.987922
Operating profit margin	1	0.998934
Mean VIF	1.19	

Source: Authors' results of Multicollinearity *test* from Stata 15 (2019)

Variable Inflation Factor (VIF) was performed using Stata 15.1. Table 4.6 shows the mean VIF as 1.19. Additionally, for non-correlation of independent variables, the mean VIF should be less than 5 and as such independent variables can be used with dependent variables. Therefore, there is no multicollinearity between the amount invested in community projects, change in fatalities, change in fossil fuels energy, debt-equity ratio and operating profit margin. This implies that independent variables can be used with the dependent variable in this study. The next section presents the covariance matrix of the coefficient.

4.3.8 Covariance matrix of coefficients of the regress model

This section discusses the Covariance matrix of coefficients of the regress model. The covariance matrix of coefficients of regress model tests linear relationships between independent variables.

Table 4. 7: Covariance matrix

e(V)	Change in fatalities	Amount invested in a community project	Change in fossil fuel energy	Operating profit margin	Debt/equity ratio	_cons
Change in fatalities	0.020968					
Amount invested in a community project	-0.00000131	0.000000000264				
Change in fossil fuel energy	0.00000000451	-0.000000000000763	0.000000000000137			
Operating profit margin	-0.000000665	-0.000000000167	0.000000000000416	0.000000416		
Debt/equity ratio	-0.00667	0.00000037	-0.00000000157	-0.00000551	0.1836	
_cons	-0.00723	-0.00000338	0.0000000074	0.0000348	-0.1908	0.843562

Source: Authors' results of the Covariance matrix from Stata 15 (2019)

Covariance matrix of coefficients of regress model test indicate the linear relationship between independent variables as perfect if it is 1, very strong if it is from 0.8 to 10, strong if it is 0.60 to 0.8, moderate if it is from 0.40 to 0.60, weak if from 0.20 to 0.40 and

extremely weak if it is from 0.00 to 0.20. Table 4.7 shows a positive but extremely weak relationship between change in fatalities and itself indicated as 0.020968. Furthermore, there is a negative and yet extremely weak relationship between change in fatalities and the amount invested in CSR indicated as -0.00000131. Additionally, there is a positive but extremely weak relationship between change in fatalities and change in fossil fuel indicated as 0.00000000451. Moreover, there is a negative and yet extremely weak relationship between change in fatalities and control variables indicated as -0.000000665 and -0.00667 respectively. The next section discusses the correlation matrix of coefficients of the regress model.

4.3.9 Correlation matrix of coefficients of the regress model

This section discusses the correlation matrix of coefficients of the regress model. Coefficient matrix measures the correlation between one independent variable and itself, and one independent variable with other independent variables.

Table 4. 8: Correlation matrix

e(V)	Change in fatalities	Amount invested in a community project	Change in fossil fuel energy	Operating profit margin	Debt/equity ratio	_cons
Change in fatalities	1					
Amount invested in a community project	-0.5563	1				
Change in fossil fuel energy	0.0842	-0.127	1			

Operating profit margin	-0.0071	-0.0159	0.0017	1		
Debt/equity ratio	-0.1076	0.0532	-0.0099	-0.0199	1	
_cons	-0.0543	-0.2266	0.0218	0.0588	-0.4848	1

Source: Authors' results of the Covariance matrix from Stata 15 (2019)

Table 4.8 presents Correlation matrix. Correlation matrix test indicates the linear relationship between variables as perfect if it is 1, very strong if it is from 0.8 to 10, strong if it is 0.60 to 0.8, moderate if it is from 0.40 to 0.60, weak if it is from 0.20 to 0.40 and extremely weak if it is from 0.00 to 0.20. Table 4.8 shows 1.000 for all independent and control variables to show that -variables are correlated to themselves. The results further show the relationship between change in fatalities and itself as 1.000 as expected. However, there is a negative and extremely weak and positive but extremely weak relationship between change in fatalities and the amount invested in community projects as well as a change in fossil fuel energy indicated as -0.5563 and 0.0842. Moreover, there is a negative but extremely weak relationship between change in fatalities and operating profit margin as well as debt-equity ratio shown as -0.0071 and -0.1076 respectively. Table 4.8 shows that amount invested in community projects correlates with itself. However, there is negative and yet extremely weak relationship between the amount invested in community projects and change in fossil fuel energy and a negative relationship between the amount invested in community projects shown as -0.127 and a negative and extremely weak relationship between the amount invested in community projects and operating profit margin indicated as -0.0159. However, there is a positive and yet extremely weak relationship between the amount invested in community projects

and debt-equity ratio indicated as 0.0532. Furthermore, the relationship between change in fossil fuel and operating profit margin is positive but extremely weak indicated as 0.0017. Lastly, change in fossil fuel has a negative and yet extremely weak relationship with debt-equity ratio shown as -0.0099. Respectively this indicates that the independent variables do not have much influence on the dependent variable. However, there could be other variables not considered in this study that has a positive influence on ROA such as liquidity ratios, assets management ratios, debt management ratios, operating expenses ratios and many others (Rosikah, Dwi, Dzulfikri, Muh-Irfandy, Miswar, 2018). The next section discussed Durbin's alternative test for autocorrelation.

4.3.10 Durbin's alternative test for autocorrelation

This section presents the Durbin's alternative test. Durbin's alternative is used to test autocorrelation between independent variables.

Table 4. 9: Durbin's alternative test for autocorrelation

lags(p)	chi^2	Df	Prob > chi^2
1	87.87	1	0.0000

H_0: no serial correlation

Source: Authors' results of Durbin's alternative test from Stata 15 (2019)

Null hypothesis: There is no serial correlation between independent variables, alternate hypothesis: there is a serial correlation between independent variables. P-value is 0.05, and if the Prob > chi^2 is more than 0.05, the null hypothesis is accepted, and the alternate

is rejected. Table 4.9 shows a Prob > chi^2 of 0.0000 which is less than 0.05. Therefore, the alternate hypothesis is accepted, and the null hypothesis is rejected as results above show the Prob > chi^2 of 0.0000 which is less than a p-value of 0.05. Hence, there is a serial correlation between variables. The study measures the relationship between SR and stakeholder value creation and ROA was used as a dependent variable. Operating profit and debt-equity ratio were used as control variables influencing ROA, hence serial correlation. However, other variables that affects ROA were purposively not mentioned in this study. The next section presents the Breusch-Godfrey LM test for autocorrelation.

4.3.11 Breusch-Godfrey LM test for autocorrelation

This section presents the Breusch-Godfrey LM test for autocorrelation. Breusch-Godfrey LM test tests for the existence of serial correlation that has not been included in a planned model structure.

Table 4. 10: Breusch-Godfrey LM test

lags(p)	chi^2	Df	Prob > chi^2
1	68.501	1	0.0000

H$_0$: no serial correlation

Source: Authors' results of the Breusch-Godfrey LM test from Stata 15 (2019)

Table 4.10 shows a null hypothesis which indicates no serial correlation between independent variables. Alternate hypothesis: There is a serial correlation between independent variables. Furthermore, Table 4.10 shows a probability of 0.0000 which is less than the p-value of 0.05. Therefore, the null hypothesis is rejected, and the alternate

hypothesis is accepted. This implies that there is a serial correlation between the variables.

4.3.12 Shapiro-Wilk W test for normal data

This section presents the Shapiro-Wilk W test. Shapiro-Wilk W test measured whether residuals are normally distributed or not.

Table 4. 11: Shapiro-Wilk W test

Variable	Obs	W	V	Z	Prob>z
EU	286	0.8607	28.448	7.841	0.0000

Source: Authors' results of the Shapiro-Wilk W test from Stata 15 (2019)

Null hypothesis: Residuals are normally distributed. Alternate hypothesis: Residuals are not normally distributed. P-value is set at 0.05 and therefore, any value less than 0.05 means null hypothesis should be accepted, and the alternate is rejected. Shapiro-Wilk W test shows a probability of 0.0000 which is less than 0.05. The alternate hypothesis is therefore accepted, and the null hypothesis is rejected as zero (0) is less than 0.05. This means that residuals are not normally distributed. ROA can be influenced by many other variables such as liquidity and assets management ratios. This study only used operating profit margin and debt-equity ratio as control variables and that led residuals to be abnormally distributed. The next chapter discusses the fixed effect model.

4.3.13 Fixed effect model

This section presents the fixed effect model in which the model parameters are fixed or non-random quantities.

Table 4. 12: Fixed Effect model

Fixed-effects (within) regression		Number of obs	=	286
Group variable: cocode		Number of groups	=	26
R-sq:		Obs per group:		
within = 0.0205		Min	=	11
between = 0.3422		Avg	=	11
overall = 0.0542		Max	=	11
		F(5,255)	=	1.07
corr(u_i, Xb) = 0.1824		Prob > F	=	0.3798

ROA	Coef.	Std. Err.	t	P>tl	[95% Conf.	Interval]
Change in fatalities	0.052583	0.142603	0.37	0.713	-0.22825	0.333413
Amount invested in community project	-0.00000388	0.000016	-0.24	0.809	-0.000035	0.0000277
Change in fossil fuel energy	-0.000000162	0.000000283	-0.57	0.569	-0.000000719	0.000000396
Operating profit margin	0.001106	0.000512	2.16	0.032	0.000098	0.002115
Debt/equity ratio	-0.19415	0.438407	-0.44	0.658	-1.05751	0.669206
_cons	8.173991	0.804396	10.16	0.000	6.589886	9.758096

sigma_u	9.28843		
sigma_e	9.545745		
Rho	0.48634		(fraction of variance due to u_i)

F test that all u_i=0: F (25, 255) = 9.19   Prob > F = 0.0000

Source: Authors' results of Fixed effect model from Stata 15 (2019)

F statistic for this model shows 1.07 and the probability value is 0.3798 which is more than 0.05. It is therefore insignificant. Table 4.12 above presents the fixed effect of independent variables and control variables on ROA. The significant level is set to be 95%. A p-value of less than 0.05 is significant. The results above showed that change in fatalities is not a significant variable to explain ROA with a coefficient of 0.052583 and a p-value of 0.713. However, the positive coefficient means that an increase in change in fatalities will positively affect ROA. Additionally, the amount invested in community projects is not a significant variable to explain ROA with a coefficient -0.00000388 and a p-value of 0.809 more than 0.05. The coefficient of -0.00000388 is a clear indication that an increase in the amount invested in community projects will decrease ROA. Change in fossil fuel energy is also not significant to explain ROA with coefficient -0.000000162 and a p-value of 0.569 which is more than 0.05. The coefficient of -0.000000162 is an indication that an increase in fossil fuel energy will result in a decrease in ROA. However, operating profit margin is a significant variable to explain ROA with a coefficient of 0.001106 and a p-value of 0.032. This implies that an increase in operating profit will increase ROA as indicated by coefficient 0.001106. Lastly, the debt-equity ratio is not a significant variable to explain ROA with a coefficient of -0.19415 and a p-value of 0.658.

However, the coefficient of -0.19415 indicated that ROA would decrease as debt-equity ratio increases. This implies that only the operating profit significantly affects ROA. The next section discusses the random effect model.

4.3.14 Random effect model

This section presents the Random effect in which all or some of the model parameters are considered as random variables.

Table 4. 13: Random Effect

Random-effects GLS regression		Number of obs	=	286
Group variable: cocode		Number of groups	=	26
R-sq:		Obs per group:		
within = 0.0187		Min	=	11
between = 0.4816		Avg	=	11
overall = 0.0839		Max	=	11
		Wald chi$^{2(5)}$	=	8.24
corr(u_i, X) = 0 (assumed)		Prob > chi^2	=	0.1436

ROA	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
Change in fatalities	0.13807	0.138907	0.99	0.320	-0.13418	0.410324
Amount invested in community project	-0.000000524	0.0000156	-0.03	0.973	-0.000031	0.0000301
Change in fossil fuel energy	-0.000000168	0.000000289	-0.58	0.560	-0.000000736	0.000000399
Operating profit margin	0.001312	0.00052	2.52	0.012	0.000292	0.002332
Debt/equity ratio	-0.17754	0.422952	-0.42	0.675	-1.00651	0.651432

_cons	7.925131	1.584768	5.00	0.000	4.819043	11.03122
sigma_u	6.825999					
sigma_e	9.545745					
Rho	0.338337		(fraction of variance due to u_i)			

Source: Authors' results of Random effect model from Stata 15 (2019)

Table 4.13 presents random effects model results. Wald $chi^{2(5)}$ stands at 8.24 for independent variables. The Prob > chi^2 stands at 0.1436 which is more than 0.05 and therefore it is insignificant. Change in fatalities shows a p-value of 0.320 which makes it an insignificant variable to explain ROA. The coefficient for change in fatalities is a positive 0.13807. Amount invested in community project shows a p-value of 0.973 which is more than 0.05 making amount invested in community projects insignificant to explain ROA. The coefficient for the amount invested in community projects is -0.000000524. Furthermore, change in fossil fuel energy is an insignificant variable to explain ROA with a p-value of 0.560 which is more than 0.05. Random effects show a coefficient of -0.000000168 for change in fossil fuel energy. However, operating profit margin is a significant variable to explain ROA. The p-value for operating profit margin is 0.012 with a coefficient of 0.001312. Lastly, the debt-equity ratio is an insignificant variable to explain ROA. P-value and coefficient for debt-equity ratio are 0.675 and -0.17754 respectively. The next chapter discusses the Hausman fixed.

4.3.15 Hausman Fixed

This section presents the Hausman fixed test. Hausman fixed distinguish between fixed effects model and the random effects model in panel data.

Table 4. 14: Hausman test

	Coefficients ----			
	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	Fixed	Random	Difference	S.E.
Change in fatalities	0.0525833	0.1380702	-0.08549	0.032256
Amount invested in community project	-0.00000388	-0.000000524	-0.00000336	0.00000362
Change in fossil fuel energy	-0.000000162	-0.000000168	0.00000000684	.
Operating profit margin	0.0011063	0.0013121	-0.0002058	.
Debt/equity ratio	-0.1941534	-0.01775389	-0.0166146	0.1153777

Source: Authors' results of Hausman Fixed from Stata 15 (2019)

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

$\chi^{2(3)} = (b-B)'[(V\_b-V\_B)^{(-1)}](b-B)$

= 3.23

Prob>χ^2 = 0.3577

(V_b-V_B is not positive definite)

Null hypothesis: Random effect model is appropriate

Alternate hypothesis: Fixed effect model is appropriate

Table 4.14 shows Prob>chi^2 of 0.3577 which is more than 0.05 and therefore the null hypothesis is accepted, and the alternate hypothesis is rejected. This implies that the random effect is the appropriate model. Therefore, random effect results will be used to determine the relationship between independent variables and dependent variable.

4.4 Results Overview

The section above discussed descriptive statistics test, two sample t-tests, regress test and Durbin-Watson tests. It further discussed the scatter plots, Breusch- Pagan tests, Multicollinearity tests, covariance matrix, correlations matrix, Durbin's alternative test and Breusch-Godfrey LM test. Additionally, the Shapiro-Wilk-W test, fixed effects, random effects and Hausman fixed were discussed.

This section discussed random effects for the hypothesis in this study. Objective number one of this study examines the relationship between employees' health and occupational safety as represented by a change in fatalities and ROA. Objective number two examines the relationship between community projects and ROA. Lastly, objective number three examines the relationship between green investments as represented by a change in fossil fuel energy and ROA. Hausman fixed results identified random effect as the relevant model to determine the relationship between independent and dependent variables.

4.4.1 Random effects: The relationship between change in fatalities and ROA (H$_1$)

The first hypothesis H$_1$ of this study states that there is no relationship between employees' health and occupational safety as represented by a change in fatalities and ROA among selected JSE manufacturing companies in South Africa. Employees' health and occupational safety were represented by a change in fatalities in this study because figures for the amount invested in employees' health and safety were not accessible, but at least almost all sampled manufacturing companies reported on fatalities and injuries. In this study, a random effect was set at a significant level is 95% (0.95) and the p-value is 0.05. Results showed a p-value of 0.320 which is greater than 0.05. Therefore, there is an insignificant relationship between change in fatalities and ROA and the alternate hypothesis is accepted. This result supports those of Haslam *et al.* (2016) where an insignificant relationship between employees' health and firm performance, represented by a high-profit margin and lower accident rate, was found. Furthermore, this result supports those of Nordlof *et al.* (2015) where a negative relationship between occupational safety and firm performance was found resulting from employees' perception that it is upon them as employees to make the best out of their work environment.

However, this result contradicts the stakeholder theory which postulates that the needs of the employees, as stakeholders, should be addressed as a way of creating value. This study believed that value would have been created where the EHS issues are properly addressed through concerted and focused investment or spending for its improvement. Random effects showed an insignificant relationship between employees' health and

occupational safety and ROA. This implies that employees' needs are not addressed as per stakeholder theory and this makes it is difficult to align SR with stakeholder value creation. When manufacturing companies treat the issue of health and occupational safety with utmost importance, employees will feel valued, and that will lead to improved productivity. Moreover, this result contradicts the King IV Code which emphasises that companies should understand what the stakeholders need and expect in order to develop better strategies (IoDSA, 2016). An insignificant relationship between employees' health and occupational safety and ROA indicates that the needs and expectations of stakeholders are not understood and met. When manufacturing companies understand the health and occupational safety needs of employees, they can put important strategies in place and implement them. Manufacturing companies need to recognise and meet the demands of company stakeholders because by satisfying employees, it will lead to good company performance, hence value creation. Additionally, one way of valuing employees can be when manufacturing companies treat the employees' health and occupational safety issue as paramount because employees will feel valued and the number of fatalities and injuries leading to reduced productivity and increase in several days absent from work, will be minimised. The next section discusses random effects on the relationship between the amount invested in community projects and ROA.

4.4.2 Random effects: The relationship between the amount invested in community projects and ROA (H$_2$)

The second hypothesis (H$_2$) states that there is no relationship between the amount invested in community projects and ROA among selected JSE listed manufacturing

companies in South Africa. Random effects results showed the negative and yet insignificant relationship between the amount invested in a community project and ROA with a p-value of 0.973 greater than that of 0.05 and therefore, H_2 which states that there is no correlation between the amount invested in community projects and ROA, was not rejected. This result is in support of those of Mwangi and Jerotich (2013) and Malik and Nadeem (2014) where an insignificant relationship between CSR and company profitability was found. Furthermore, this result contrasts those of Kiran *et al.* (2015) where a significant relationship between CSR and firm performance was found. However, companies should engage in community projects as a way of being socially responsible and responsive to the community it operates in. When companies do not engage in community projects, the community within which it operates, as stakeholders, will feel not valued and as a result, they might end up not associating nor patronising the company.

An insignificant relationship between the amount invested in community projects and ROA indicates that companies are not engaging in CSR activities and that contradicts the stakeholder theory and King IV Code, and that becomes a challenge as to how to stakeholder value has been created. Susith and Steward (2014) highlighted that companies which engage and disclose CSR activities create value for stakeholders. This implies that when manufacturing companies undertake sustainability initiatives, they should be included in the sustainability reports as per GRI guideline for reporting. Moreover, companies should exercise stakeholder inclusivity and respond towards stakeholders' needs as per King IV Code (IoDSA, 2016). In other words, the more the company engages in social activities, the more customers will mushroom and as a result

company profits will increase. The next section discusses random effects on the relationship between fuel fossil energy and ROA.

4.4.3 Random effects: The relationship between fossil fuel energy and ROA (H_3)

Hypothesis three (H_3) of this study states that there is no relationship between green investments and ROA among selected JSE listed manufacturing companies in South Africa. The green investment was represented by fossil fuel energy in this study as it was common among manufacturing companies sampled in this study. Random effect confidence level is set at 95% with a p-value of 0.05. Change in fossil fuel energy shows a p-value of 0.560 which is higher than 0.05 and therefore hypothesis three (H_3) which states that there is no correlation between green investments, as represented by a change in fossil fuel energy, and ROA is accepted.

This result contrasts with those of Luan *et al.* (2016), Lee and Min (2015) and Dixon-Fowler *et al.* (2013) where the focus was on the relationship between green investments and ROA. Results showed a significant relationship between ROA represented by firm performance (which in this study is a proxy for value creation) and green investment represented by the prevention of pollution, ISO 14000 and green processes. Furthermore, this result contrasts the stakeholder theory and King IV Code. An insignificant relationship between green investments and ROA indicates a contradiction with stakeholder theory which postulates that companies should treat the natural environment as one of the stakeholders sideways with green investment activities in order to promote environmental initiatives. Moreover, companies should put more consideration on environmental

impacts resulting from business activities as postulated in King IV Code. This contradiction makes it challenging to align SR with stakeholder value creation. However, manufacturing companies should try to minimise the environmental impact by promoting green investment activities since some stakeholders are likely interested in associating with companies that practice green. The next section presents the summary for this chapter

4.5 Chapter summary

In this chapter, data were analysed and interpreted. Different tests result from Stata 15 were analysed and interpreted. Descriptive test which showed the number of observations to be 286 for 26 manufacturing companies was discussed. Two sample t-tests for measuring the relationship between control variables were discussed. Additionally, regression tests were discussed. Among other tests discussed were Durbin-Watson tests, scatter plots, Breusch- Pagan tests, Multicollinearity tests, covariance matrix, correlations matrix, Durbin's alternative test, Breusch-Godfrey LM test and the Shapiro-Wilk-W test. Moreover, the Fixed effect and Random effect models were discussed wherein Hausman fixed was used to decide on the model. The overview of results and random effects for the hypothesis were also discussed. The next chapter comprises of summary, conclusion, recommendations and paths for future researchers.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Introduction

The previous chapter presented the result of the study. This chapter, therefore, presents the summary of the study, recommendations, paths for future researchers and conclusion.

5.2 Summary of the study

The aim and objectives of this study were achieved through the discussion of different traits of the existing literature and theoretical frameworks. Based on the literature reviewed in Chapter Two, there is little or no studies about SR and stakeholder value creation focusing on manufacturing companies in South Africa. Chapter Two discusses the stakeholder theory which encourages companies to engage in corporate social projects and disclose the said projects. Moreover, manufacturing companies are encouraged to engage in corporate social projects and activities that address health and occupational issues and green initiatives to address stakeholders' needs. It is believed that such engagements will lead to increased profitability whereby the stakeholders are satisfied. Furthermore, Chapter Two discussed the King IV Code which recommends that companies should respond to stakeholders' needs regarding sustainability issues, hence, stakeholder inclusivity. The King IV Code recommends that companies should develop better strategies and have a better understanding of their stakeholder needs and interests to meet their expectations. The chapter further discussed SR and the reasons for corporate citizenship reporting. The GRI guidelines were discussed which provide

guidelines and principles for reporting on companies' sustainability performance. Moreover, the link between sustainability reports and stakeholder value creation was discussed noting that when companies report to stakeholders through sustainability reports and their expectations are met; value is created. Employees' health and occupational safety as a variable for social dimension was discussed as well as its influence on ROA within manufacturing companies. Some researchers found that those companies that are proactive with their employees' health and occupational safety concerns have had high-profit margins. On the other hand, other researchers asserted that when companies engage in health and safety issues, they are imposing certain lifestyles on employees. However, manufacturing companies are encouraged to treat the issue of health and safety with high importance to reduce the level of fatalities and injuries at the workplace.

The relationship between community projects expenditure and its influence on ROA was discussed. Through literature, it was noted that a company engaging in community projects could bring about community and customers' satisfaction and therefore, ethical company performance. Moreover, manufacturing companies should engage in community projects to entrench social cohesion between the community and the company. Green investments and its relationship to ROA were among the discussions in Chapter Two. Types of green investments: ISO 14000, green processes and prevention of pollution were discussed.

Additionally, components of green investments: low-carbon, energy efficiency and carbon sequestration were further discussed. This study noted through literature that green

companies are likely to achieve higher profit margins. Hence, manufacturing companies were encouraged to invest in green projects to create a safe environment for all.

Chapter Three described the overall research methodology. The correlational research design was adopted for this study to measure the relationship between independent variables and the dependent variable. A positivist paradigm was used for this study since the quantitative method was adopted. The use and justification for using the quantitative method were explained, which helped the researcher to address the objectives of this study. Data used in this study was obtained from published manufacturing companies' annual integrated reports and sustainability reports through the company's websites and the IRESS Database. The target population were all JSE listed manufacturing companies in South Africa because listed companies publish their financial statements according to JSE listing requirements and those reports are audited and publicly available. There were about thirty (30) manufacturing companies listed on the JSE at the time of this study. Twenty-six (26) manufacturing companies from the food production, beverages, forestry and paper, tobacco, oil and gas and general industrials were purposively sampled. Dependent variable, independent variables and control were described. Additionally, data were analysed using panel data utilising the MLRA to find the relationship between dependent and independent variables. MLRA was considered suitable in this study as the relationships between the dependent variable and independent variables were measured.

Chapter Four presented the analysis of data and results of the study from the statistical analysis to achieve the study objectives and listed research hypothesis. Descriptive statistics results were discussed where ROA as a dependent variable reflected the most

substantial growth rate as compared with independent variables, change in fatalities and debt-equity ratio. However, operating profit margin had the most substantial influence when compared to ROA, change in fatalities and debt-equity ratio. The two sample t-test was performed on the control variables. Other tests conducted were: regression test for estimating the relationship between a dependent variable and independent variables, Breusch-Pagan test for heteroscedasticity in a linear regression model, Multicollinearity test for measuring the correlation between independent variables, Covariance matrix of coefficients of regress model for testing linear relationships between independent variables, coefficient matrix for measuring the correlation between one independent variable and itself, and one independent variable with other independent variables.

Furthermore, Durbin's alternative test was conducted to test for autocorrelation. *Shapiro-Wilk W* test was conducted to measure whether residuals are normally distributed or not. Lastly, random effects and fixed effect models were discussed wherein the Hausman fixed was used to decide on the model to be used.

The study revealed a positive and insignificant relationship between employees' health and occupational safety, as represented by a change in fatalities and ROA. Additionally, a negative and yet insignificant relationship between the amount invested in a community project and ROA was further revealed. Moreover, a positive yet insignificant relationship between change in fossil fuel energy and ROA was revealed. The result of this study might add to the existing knowledge and literature on sustainability and stakeholder value creation. The study might pave way for further research in the field of sustainability and stakeholder value creation. The next section presents the conclusion for the study.

5.3 Recommendations

The study provides recommendations as follows:

5.3.1 Knowledge and practice

This research bridged the existing gap in knowledge about SR and stakeholder value creation in listed manufacturing companies as no previous studies in SR and stakeholder value creation was conducted. Additionally, through literature, it was essential that manufacturing companies that are pro-active on issues of employees' health, community projects and green investment has had higher profit margins since the majority of them based on the result appear not to prioritise sustainability issues considered in this study. As such, the results from this study encourage manufacturing companies to put more efforts on improving sustainability issues to create value for the stakeholders.

5.3.2 Contribution of the study

Based on the results from this study which showed insignificant relationships between independent variables and dependent variable in sampled JSE listed manufacturing companies, it is clear that value has not been created for the employees, the community and the environment because the sampled companies have not prioritised these sustainability issues in their operations.

5.4 Conclusion

This study examined the relationship between SR and stakeholder value creation represented by variables: employees' health and occupational safety, community projects, green investments and ROA in JSE listed manufacturing companies. Data were collected from sustainability reports of twenty-six manufacturing companies listed at JSE from 2007 to 2017. In examining the relationship between SR and stakeholder value creation, the relationship between employees 'health and occupational safety with ROA, community projects with ROA and green investments with ROA were measured. Employees' health and occupational safety, community projects and green investments were used as independent variables whereas ROA was used as a dependent variable. Results from statistical analysis showed no relationship between these variables among the twenty-six sampled JSE listed manufacturing companies. This results, therefore, indicate whether a value has been created for employees working for the manufacturing companies and for the community and the environment within which these manufacturing companies operate.

However, based on the analysis of data in this study, the value was not created for the stakeholders probably because issues relating to employees' health and safety, green investments and community projects were not prioritised by manufacturing companies selected in this study.

5.5 Future research

This study paved the way for future researchers in the area of SR and stakeholder value creation. Future researchers can bring all sectors or conduct inter-country research on SR and stakeholder value creation. Future researchers that can offer answers to the above questions will provide an understanding of the relationship between SR and stakeholder value creation.

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