The impact of COVID-19 on the relationship between sustainability and financial performance: A multi-theoretical interpretation

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ABSTRACT

Title: The impact of COVID-19 on the relationship between sustainability and financial performance: A multi-theoretical interpretation

Keywords: COVID-19; Environmental, Social, Governance (ESG); financial performance; Johannesburg Stock Exchange (JSE); multiple theories; South Africa; sustainability performance; theoretical framework; Tobin’s Q; return on equity (ROE).

Most research papers do not emphasise the importance of theoretical frameworks enough – theories are often only included for publication purposes, or briefly mentioned and never revisited, or even omitted. The focus of this study was to consider how theoretical frameworks impact the interpretation of results. The primary objective of the study was to consider the interpretation of multiple theories (six selected theories) on a specific scenario, i.e., the relationship between JSE listed companies’ financial performance (in terms of financial ratios) and sustainability performance (in terms of ESG) before and after the COVID-19 pandemic.

Literature revealed that there are inconclusive results regarding the relationship between financial and sustainability performance. Furthermore, there were limited cases where this relationship was examined within a crisis-period. The most recent crisis, the COVID-19 pandemic, had an immense impact on companies’ performance; subsequently this study investigated the relationship between companies’ financial and sustainability performance before and after COVID-19. This relationship was used as a scenario where the results obtained were interpreted within the context of multiple theoretical frameworks.

A sample of 104 JSE listed companies from the sectors that were probably most severely affected by COVID-19 was selected. Data was extracted for 2017 to 2022 to analyse the association between financial performance and sustainability performance. A mixed effect regression model was developed to test the association and to provide a basis to interpret the results within the context of multiple theories.

ROE, an accounting-based measure of financial performance, was the main indicator of financial performance. However, after correlations were conducted, Tobin’s Q, a market-based measure of financial performance, and ESG, a measure of sustainability performance, revealed the most significant relationship – therefore, the relationship between these two variables, before and after COVID-19, was considered when the results were interpreted within multiple theories.

It was concluded that sustainability performance had a negative impact on financial performance, both before and after COVID-19. In contrast, financial performance had a negative impact on sustainability performance before COVID-19, but a positive impact after COVID-19. These results were interpreted within the context of stakeholder-, stewardship-, signalling-, shareholder-, resource-based- and legitimacy theory. It was concluded that the theoretical framework from which a specific scenario is considered, impacts the interpretation of results, i.e., the same results can be seen as positive or negative, depending on the applicable theory. This illustrated the importance of theoretical frameworks.

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LIST OF ABBREVIATIONS

BSC	:	Balanced Scorecard
CEO	:	Chief Executive Officer
COVID-19	:	Coronavirus disease 2019
CSR	:	Corporate Social Responsibility
EBIAT	:	Earnings before interest but after tax
EBIT	:	Earnings before interest and tax
ESG	:	Environmental, Social, Governance
FLM	:	Financial Leverage Multiplier
FP	:	Financial performance
GDP	:	Gross Domestic Product
GVIF	:	Generalised Variance Inflator Factor
IIRC	:	International Integrated Reporting Council
IRESS	:	Identification of Requirements for Enterprise Social Software
ISO	:	International organisation for standardisation
JSE	:	Johannesburg Stock Exchange
NWU	:	North-West University
ROA	:	Return on assets
ROE	:	Return on equity
SA	:	South Africa
SBSC	:	Sustainable Balanced Scorecard
SDG	:	Sustainable development goal
SP	:	Sustainability performance

TBL	:	Triple Bottom Line
UK	:	United Kingdom
UN	:	United Nations
WHO	:	World Health Organisation

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1 INTRODUCTION

"Educators often superficially toss out the name of a theorist or make a sideways reference to a specific theory and move on, as if assuming their audience possesses the necessary familiarity to appreciate, evaluate, integrate, and appropriately apply its insights for improving their particular set of circumstances" (Kessler, 2013).

Kessler (2013) elaborated on the above statement by stating that researchers frequently encounter a stumbling block: "Which motivational theory should they use?" Consequently, researchers select a theory arbitrarily, as if all theories are applicable in all circumstances. Rocco and Plakhotnik (2009) stated that a theoretical framework anchors a research paper. Furthermore, Merriam and Simpson (cited by Rocco & Plakhotnik, 2009) stated that a theoretical framework serves the following functions: it forms the basis of research, it illustrates the study's contribution to knowledge, it provides clarity on the study, it evaluates the research design, and lastly it provides guidelines for the interpretation of results. It is thus evident that a theoretical framework is a crucial component of any research study (Muthukrishna & Henrich, 2019).

Literature reveals that, when one specifically considers the relationship between companies' financial and sustainability performance, there are not only contradictory results, but the theories used in explaining this relationship are also inconsistent (Hussain *et al*., 2018). There are multiple theories addressing the contribution of sustainability to companies' financial performance; however, the interpretation and application of these theories, within a certain context (for example a crisis-time), are limited (Lozano *et al.*, 2015). According to De Soto *et al.* (2021) there are no specific guidelines for overcoming crises; the actions implemented determine the effect a crisis has on a company. This is confirmed by Pisani and Russo (2021), who stated that sustainable operations provide resilience to companies during a crisis-time.

Crises are inevitable. However, if companies understand the crisis, its threats and impact, and make sufficient use of its available resources, they will be able to overcome the crisis (Jankelová *et al.*, 2021). Shabnam (2014), supported by Klomp and Valckx (2014), indicated that crises, like natural disasters, have a negative impact on a country's economic growth. The devastating effect of these disasters can cause significant economic damages (Panwar & Sen, 2019). The weakened economy, due to the occurrence of natural disasters, are likely to cause companies to suffer financially (Keerthiratne & Tol, 2017). On the other hand, companies that invested in sustainability operations are likely to be more resilient during a crisis-time (Broadstock *et al.*, 2021). Li *et al.* (2021) further noted that sustainability operations have an impact on a company's financial performance and that the relationship between a company's financial and sustainability performance might differ when one considers the environment in which the company operates, that is, during a crisis-time or not.

When considering the above statements, the purpose of this study is to consider the interpretation of multiple theories within a certain set of circumstances; before and after a time of crisis.

2 BACKGROUND

The following sections provide an explanation of the key concepts to this study, namely the Coronavirus disease 2019 (COVID-19) crisis in South-Africa, sustainability performance, financial performance, the relationship between sustainability and financial performance, and lastly the most important concept: the interpretation of theoretical frameworks. Thereafter, a schematic diagram is presented to illustrate the interrelationship between these concepts for the purpose of this study.

2.1 The COVID-19 crisis in South Africa

According to Shaluf, Ahmadum and Mat Said (2003), a crisis can happen to any organisation and will most likely threaten the existence of the organisation. A crisis can develop from situations within or outside of an organisation (Khodarahmi, 2009). External situations constitute factors that are outside of an entity's control. This includes natural disasters. The impact of natural disasters on developing countries is greater than on developed countries (Alcántara-Ayala, 2002). This is because developing countries have a shortage of resources, infrastructure and readily available systems to react to these crises (Watson *et al*., 2007). South Africa is known as a developing country (International Statistical Institute, 2023) and is thus vulnerable to the impact of natural disasters. Furthermore, natural disasters do not only refer to environmental crises, but also involve the outbreak of infectious diseases (Sakamoto *et al*., 2020). Both epidemics and pandemics are infectious diseases that can spread globally (Mocnik *et al.,* 2020). Epidemics and pandemics that have affected, or are still affecting South Africa include, but are not limited to, the Spanish Influenza Epidemic of 1918, Polio, human immunodeficiency virus (HIV), Tuberculosis and the Corona Virus Disease (COVID-19). This confirms that South Africa, a developing country in Southern Africa, is prone to natural disasters (Lukamba, 2010).

The outbreak of COVID-19, which originated in China, was announced in December 2019. Following the rapid spread of the highly contagious virus, the World Health Organization (WHO) declared a global pandemic on 12 March 2020 (Ciotti *et al.*, 2020). This pandemic posed significant threats to low- and middle-income countries, which included South Africa (Lone & Ahmad, 2020).

COVID-19 also posed many challenges for companies (Almeida *et al.*, 2020). Achim *et al.* (2021) said that COVID-19 had a severe financial impact on the performance of the business and commerce sector, thus confirming that companies struggled during this time. Businesses were forced to close their doors or to scale down their operations and to retrench employees, which lead to the disruption of many industry sectors (Donthu & Gustafsson, 2020). This crisis was clearly also an inevitable threat to the survival of South African companies. Bulled and Singer (2020), supported by Almatrooshi *et al.* (2022), indicated that country-specific efforts, effective management and definite resources are needed to overcome the threats imposed by COVID-19. This includes the management of companies from a sustainability perspective and investing in sustainability activities, as this will provide resilience to companies during a crisis-time, like COVID-19 (Broadstock *et al.*, 2021).

2.2 Sustainability performance

Companies are held accountable for their actions, are expected to be transparent about their operations and must report about their financial and non-financial performance to its stakeholders (Abeysekera, 2012). This is done in the form of integrated reporting which entails the communication about a company's activities and use of resources to its stakeholders (Vaz, 2016). Krzus (2011) noted that an integrated report is a single report that illustrates the interrelationship between a company's financial and sustainability performance. It was further noted that an integrated report reflects an entity's environmental, social, governance and economic circumstances – this sustainability information can be used by management for decision-making purposes and can also provide guidance to companies in a crisis-time, like COVID-19 (Kzrus, 2011). The International Integrated Reporting Council (IIRC) indicated that, when financial and non-financial reports are combined, it provides more clarity to investors. These non-financial reports include reports about an entity's environmental, social and governance (ESG) performance (IIRC, 2013).

Companies can report about their ESG activities within their integrated report, or choose to issue a separate report (Mervelskemper & Streit, 2016). Regardless of where companies report, their ESG performance remains crucial information required by stakeholders as they are interested in monitoring whether companies contribute to sustainability or not (Arvidsson & Dumay, 2021). Amel-Zadeh and Serafeim (2018) identified examples of the information that can be used to evaluate a company's ESG performance. To evaluate a company's environmental performance, factors like water usage, carbon emission and the production of waste are considered. For social performance, circumstances relating to employees, politics and customers are examined. Lastly, for governance performance, a company's board of directors, their political situations and anti-corruption schemes are investigated.

In South Africa, the Johannesburg Stock Exchange (JSE) listed companies are required to provide integrated reports when issuing their financial statements or, if no reports are issued, provide an explanation for not doing so (Setia *et al*., 2015). The purpose of an integrated report is to illustrate how a company creates value in terms of six capitals: financial, manufactured, intellectual, human, social and relationship and lastly, natural (Manes-Rossi, 2018). Consequently, a firm's integrated report could explain one's understanding of the firm's financial performance and sustainability performance (Pavlopoulos, 2019).

2.3 Financial performance

Different industries and sectors play a vital role in the economy. It is thus important to evaluate the financial performance of the companies in these industries and sectors by comparing the financial results (such as ratios) to prior results (Correia, 2019). COVID-19 severely impacted the financial performance of South African companies that operated in the industries that were considered as the providers of non-essential goods and services (Department: Statistics South Africa, 2020). The financial performance of companies can be analysed through conducting financial ratio analyses (Hefer & Walker, 2020). Financial ratios vary across different time periods (Salmi & Martikainen, 1994), and since COVID-19 impacted the financial performance of companies, the financial ratio analyses of companies before and after COVID-19 are likely to differ (Alsamhi *et al*., 2021).

Different classes of ratios evolved over time, which include liquidity, profitability, cash flow, asset management, debt management and market value ratios (Marx, 2019). Brigham and Houston (cited by Liesz, 2002) stated that return on equity (ROE), a market value ratio, is the main accounting ratio to be used when evaluating a company's financial performance. The Du Pont model provides a breakdown of ROE into five different ratios (the drivers of ROE) – this model can thus be used to identify which factors cause the fluctuations in ROE, and also to evaluate different aspects of a company's performance (Liesz, 2002). Financial performance can also be measured by making use of market-based measures, for example Tobin's Q, whereby financial performance is measured from an investment perspective (Fu *et al.*, 2016). By analysing financial data, the effectiveness of a company's operations and the company's current financial situation are identified and evaluated (Drake & Fabozzi, 2012). In addition to evaluating performance, Hefer and Walker (2020) also added that financial ratio analyses can be used to forecast a firm's future performance, or even the possible collapsing of a firm. Since financial ratios vary across different industries (Salmi & Martikainen, 1994), uniform formulas must be applied when ratios (for example, ROE/Tobin's Q) for different industries are calculated and compared.

Different industries attract different stakeholders and these stakeholders play a key role in the success of the industry (Kamassi *et al.,* 2020). Stakeholders are seen as individuals and/or groups who have an interest in a firm and that have the ability to influence a firm or to be influenced by the firm's actions (Alvarez & Sachs, 2021). Consequently, it is important for these stakeholders to be informed of not only the sustainability performance disclosed in integrated reports, but also the financial performance of the companies within the specific industry (Morsing & Schultz, 2006). Morsing and Schultz (2006) also stated that stakeholders, for example potential investors, require effective communication from companies regarding their operations and financial performance.

The financial statements of companies that are listed on an exchange are publicly available which eases the process for stakeholders to stay informed about a company's performance. It thus seems suitable to consider the financial performance of listed companies, not only because their financial statements are widely available, but also due to the fact that these companies are in the public eye (Hermawan *et al*., 2010).

As this is a South African study, companies listed on the JSE were the preferred subject to investigate. The JSE is an electronic trading system in South Africa that was founded in 1887 and that developed into the centralised market where securities are traded (JSE, 2023). The JSE consists of ten different industries, each containing various sectors (Listcorp., 2023). The industries that were most probably more severely impacted by COVID-19 include industries that are involved in logistics and supply chains, telecommunication, tourism, construction, transport and certain mining operations (Department: Statistics South Africa, 2020). Luke (2020) stated that the transport, mining, manufacturing, trade, hospitality and communication sectors of South Africa are the sectors which were severely impacted by COVID-19. Consequently, it is expected that not only the financial performance of companies in these sectors, but also their sustainability performance would have been influenced by the COVID-19 pandemic (Alsamhi *et al*, 2021; Broadstock *et al.*, 2021).

2.4 The relationship between financial and sustainability performance

Due to the occurrence of crises, such as global warming and the COVID-19 pandemic, companies tend to focus on their impact on the environment, society and governance, resulting in companies investing in sustainable operations (Chen & Xie, 2022). Chen and Xie (2022) further noted that companies' sustainability performance (ESG) impacts their financial performance. ESG is considered to be a resilience-tool, especially during a crisis-time like COVID-19, and therefore companies that invest in ESG activities attract, for example, potential investors. It is important for companies to be conscious about the relationship between their financial and sustainability performance, since financial performance is impacted by the ESG activities of companies. This information is useful for management as it guides them in determining what actions need to be implemented in order to improve the company's financial performance, whether during a crisis-period or not (Hussain *et al*., 2018). COVID-19 negatively impacted companies' financial performance due to, among other things, the withdrawal of support from investors. However, the impact is expected to be less for companies that invested in ESG activities, as good sustainability

(ESG) performance during a crisis-time indicates a more resilient company, thereby attracting investors (Broadstock *et al*., 2021). This illustrates the signalling theory, as companies with high ESG investments send positive signals of crisis-resilience and future firm performance to investors (Broadstock *et al*., 2018; Yasar *et al*., 2020). The signalling theory is only one of multiple theories that can be used to interpret specific scenarios (Kessler, 2013) - in this case, the relationship between sustainability and financial performance prior to and after COVID-19.

2.5 Theoretical frameworks

Theories are statements that anticipate certain outcomes in specific circumstances and provide a frame wherein results are interpreted (Kessler, 2013). Theoretical frameworks are used to provide an explanation of actual situations by considering whether predictions were true or not (Wacker, 1998). Kessler (2013) identified various theories that can predict reality which includes, amongst others, stakeholder theory, stewardship theory and signalling theory. Fernando and Stewart (2014) added that legitimacy theory can also be used to explain certain outcomes. In addition, Danielson *et al.* (2008) considered shareholder theory as important, whereas Lockett *et al.* (2009) argued that resource-based theory provides support to organisations. These theories can be used to interpret certain situations, and the interpretations of the same results are likely to differ - depending from what theoretical perspective a specific situation is considered (Kessler, 2013).

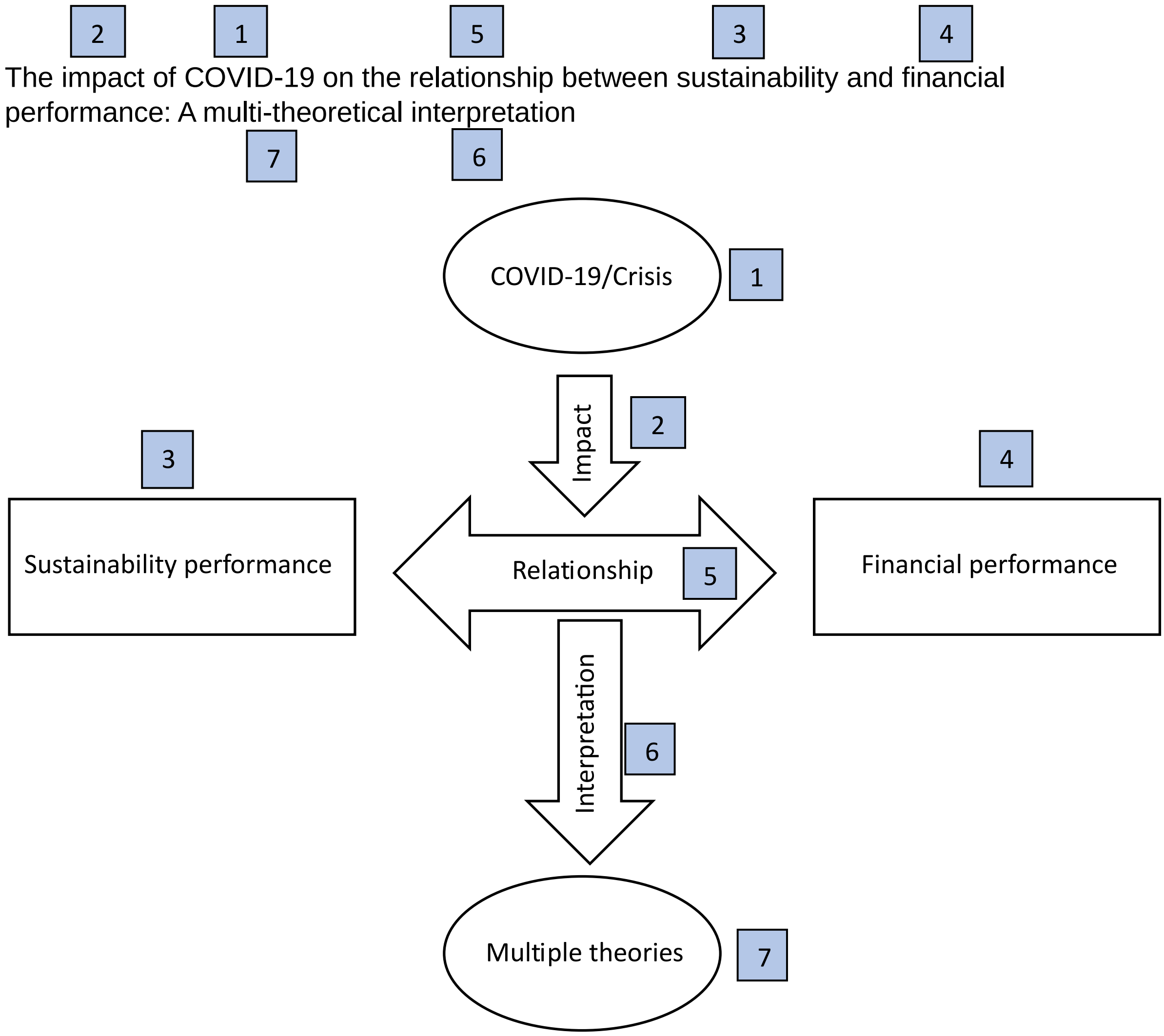
Grant and Osanloo (2014) stated that a theoretical framework is crucial to any research process. It is, however, often neglected in research papers or only briefly mentioned and never revisited. The selection of a theoretical framework is a prerequisite for a research paper and is the prerogative of the researcher, but often also an obstacle to the researcher (Grant & Osanloo, 2014). After conducting a literature review (see *section 3*), it is evident that researchers do not give adequate consideration to the interpretation of theoretical frameworks and since the same theories are used by various researchers, it comes across as if researchers only choose a theory based on what previous researchers have done. Subsequently, the following questions arise: What is the science behind choosing a specific theory? When is which theory the most applicable?

Stakeholder theory states that companies must act in the best interest of various stakeholders, as stakeholder-satisfaction increases companies' value (Hefer & Walker, 2020). In terms of stewardship theory, organisations perform well if their managers and leaders are focused on serving the organisation and its goals and when they are not concerned about obtaining personal benefits from their actions (Keay, 2017). Signalling theory states that a company's actions send a signal to its stakeholders; how the signal is interpreted by them, determines their subsequent course of action (Hefer & Walker, 2020). Legitimacy theory advises companies to disclose their social and environmental activities, as this will confirm that they are adhering to the norms, values and beliefs of the society (Schiopoiu Burlea & Popa, 2013). Regarding shareholder theory, the main objective of companies must be the maximisation of shareholder wealth, as shareholders are the key investors in companies (Danielson *et al.*, 2008). Lastly, resource-based theory states that companies that employ valuable and unique resources are more likely to obtain a competitive advantage in their respective industries (Lockett *et al.*, 2009). Grant and Osanloo (2014) stated: "Multiple theories give varying perspectives on the same issue." The purpose of this study is thus to understand the effect of different theories on the same results, i.e., the relationship between sustainability and financial performance of companies before and after COVID-19.

2.6 Schematic diagram of the interrelationship between the concepts

Below is a schematic diagram of the interrelationship between the terms/variables, as applicable to the present study.

Figure 1: Interrelationship between the terms/variables



1 COVID-19 = Crisis (used as an example of a crisis)

2 Impact = “Before” and “After” – analysis

3 Sustainability performance = ESG ratings (measure)

4 Financial performance = Financial ratios (accounting-based and market-based, ROE/Tobin’s Q)

5 Relationship = Correlation and casual relationship – analysis

6 Interpretation = How different theories, as a conceptual framework, interpret the same results

7 Multiple theories = stakeholder-, stewardship-, signalling-, shareholder-, resource-based and legitimacy theory

(Source: Researcher’s own contribution, 2023)

With this study, we find ourselves middle in the debate of the relationship between financial and sustainability performance before and after COVID-19. This is, however, only a secondary issue (an example of how to interpret multiple theories) – the main issue lies within the interpretation of multiple theories on the same results (no. 6 in the schematic diagram).

3 SUMMARY OF LITERATURE REVIEW

Toracco (2005) stated that a literature review does not only provide a new perspective on a certain topic, but also assists in the development of new theoretical frameworks. According to Rocco and Plakhotnik (2009), a literature review lays the groundwork for a research study and aids the formulation of a problem statement and the purpose of the study.

In the process of reviewing literature, various prior research studies relating to COVID-19 and its impact on companies' performance, as well as the relationship between ESG performance and financial performance, were identified. Most studies addressed their results within only one, mostly two, theoretical perspectives and did not consider how the same results would be interpreted from multiple other theories, including stakeholder-, stewardship-, signalling-, shareholder-, resource-based and legitimacy theory. A short overview of some of these prior studies is given below.

Literature revealed that COVID-19 had a significant negative impact on the financial performance of companies (Shen *et al*., 2020; Purwanto *et al.*, 2022). However, this impact is diminished if companies implemented corporate social responsibility (CSR) policies during COVID-19 (Mattera *et al.*, 2021). CSR strategies, low debt, low firm valuation ratios and increased investments are considered to be resilience-tools to companies during a crisis-time, like COVID-19 (Yeon *et al.*, 2021; Kaczmarek, 2021).

Fatemi *et al.* (2018) concluded that ESG activities and disclosure impacts a company's value based on how stakeholders interpret a firm's ESG activities and use of resources – thus from the perspective of stakeholder theory and resource-based theory. Foreign companies with high ESG ratings (which indicates good sustainability performance) proved not having experienced a sharp decline in their financial performance during COVID-19. This was due to effective ESG management and how it was interpreted by stakeholders, confirming legitimacy and stakeholder theory (Hwang *et al.*, 2021).

In a South African context, Mans-Kemp and Van Der Lugt (2020) concluded that a high quality of integrated reporting will lead to higher sustainability performance (in terms of ESG activities) and an increase in financial performance in terms of earnings per share and high leverage. This study was done within the context of legitimacy theory. In contrast, Kalia and Aggarwal (2023) stated that ESG scores have little to no impact on a firm's financial performance if the firm is situated in a developing country, but in a developed country firms with high ESG scores are likely to show better financial results. Kalia and Aggarwal (2023) based their study on stakeholder theory.

Yoo *et al*. (2021), supported by Beloskar and Rao (2022), revealed that firms with high ESG scores will be less volatile during a crisis like COVID-19, since ESG performance provides some sort of immunity to firms during a crisis period. Beloskar and Rao (2022) also concluded that investors are more likely to invest in firms with high ESG ratings during a crisis-time, which results in an increase in firms' investment performance - thus supporting stakeholder theory. Based on stakeholder theory, Saygili *et al*. (2021) stated that a company's ESG activities and related disclosures have an impact on its corporate financial performance: environmental disclosures have an adverse impact on corporate financial performance, whereas the disclosure of social activities will positively impact corporate financial performance. Saygili *et al.* (2021) also noted that crises affect the relationship between ESG and corporate financial performance.

Velte (2017), as well as Zhao *et al.* (2018), investigated - based on stakeholder theory - whether there is a correlation between foreign companies' ESG activities and their financial performance. It was discovered that companies' ESG performance has an impact on financial performance and that governance activities mostly affect the company's performance and not the environmental or social activities. Zhao *et al.* (2018) advised that potential investors must consider a company's ESG activities prior to investing, as this will be an indication of future returns yielded by the company.

Prior research studies performed by various researchers indicated contradictory relationships between ESG and financial performance, and that firms' ESG performance mainly impacts their market values and earnings per share. In addition, it was concluded that the relationship between a firm's ESG performance weakens as a firm increases in size (Ahmad *et al.*, 2017). Broadstock *et al.* (2021) further stated that more research is needed regarding the importance of sustainability performance (ESG) of companies during a crisis-time, like COVID-19. From the above, it is evident that contradictory results were obtained from studies that investigated the relationship between ESG and financial performance, and that limited research was done on these relationships within the context of a crisis-period, like COVID-19. Furthermore, the theoretical frameworks used in these studies were not adequately considered, as it was only briefly mentioned and not interpreted by the researchers.

4 PROBLEM STATEMENT

South Africa is one of many countries that have been impacted by global crises, especially the COVID-19 pandemic. A literature review revealed that various prior studies analysed the impact of COVID-19 on the financial performance of foreign companies. Limited studies, specifically pertaining to South African JSE listed companies, were found. Furthermore, none of these studies investigated the relationship between these companies' financial performance and sustainability performance (ESG) before and after a crisis-time, like COVID-19. In addition, mixed results were obtained from prior studies that investigated the relationship between financial performance and ESG. Most importantly, it was noted that most studies only provided a brief overview of the theoretical perspective from which the study was conducted, with no interpretation of the results in the context of the specified theory. This is confirmed by referring back to Lozano *et al*. (2015) and Hussain *et al.* (2018), stating that research studies make use of inconsistent theories or neglect the interpretation of these theories within a certain context. It is thus apparent that there is a need for the interpretation of multiple theories on the same set of circumstances, in this case the relationship between companies' financial and sustainability performance before and after a crisis-time (COVID-19).

5 RESEARCH OBJECTIVES

A primary objective as well as secondary objectives were established:

5.1 Primary objective

The primary objective of the study is to consider the interpretation of multiple theories (six selected theories) on a specific scenario, i.e., the relationship between JSE listed companies' financial performance (in terms of financial ratios) and sustainability performance (in terms of ESG) before and after the COVID-19 pandemic.

5.2 Secondary objectives

To reach the primary objective, the following theoretical and empirical secondary objectives were formulated:

5.2.1 Theoretical objectives

Theoretical objective 1: To consider multiple theories that are used to explain phenomena and the importance and interpretation thereof.

Theoretical objective 2: To investigate the use of financial ratio analyses (specifically ROE and Tobin's Q) to evaluate financial performance and how these ratios are interpreted.

Theoretical objective 3: To evaluate the importance of sustainability performance and how it is measured in terms of ESG scores.

Theoretical objective 4: To review existing literature to determine the impact of COVID-19 on the financial performance of JSE listed companies and what the findings were.

5.2.2 Empirical objectives

Empirical objective 1: To analyse the financial performance (in terms of ROE/Tobin's Q) of South African JSE listed companies (in the Basic Materials, Industrials, Consumer Goods, Consumer Services and Communication industries) by calculating and analysing appropriate ratios prior to and after the COVID-19 pandemic.

Empirical objective 2: To analyse companies' ESG scores, in total and per pillar, to evaluate their sustainability performance.

Empirical objective 3: To establish the relationship between companies' sustainability performance and financial performance.

Empirical objective 4: To demonstrate how the interpretation of the relationship between companies' financial performance and sustainability performance (before and after COVID-19) is impacted when considered within the context of six selected theories.

Table 1 provides a high-level overview of how the above objectives will contribute to the study's primary objective:

Table 1: High-level overview of interpreting results

Relationship between:	**Before COVID-19** **(No crisis)**	**After COVID-19** **(No crisis/Recovering from a crisis)**
FP & SP	**Stakeholder theory**	
→ *Positive*		
→ *Negative*		
→ *Neutral*		
FP & SP	**Stewardship theory**	
→ *Positive*		
→ *Negative*		
→ *Neutral*		
FP & SP	**Signalling theory**	
→ *Positive*		
→ *Negative*		
→ *Neutral*		
FP & SP	**Shareholder theory**	
→ *Positive*		
→ *Negative*		
→ *Neutral*		
FP & SP	**Resource-based theory**	
→ *Positive*		

→ *Negative*		
→ *Neutral*		
FP & SP	**Legitimacy theory**	
→ *Positive*		
→ *Negative*		
→ *Neutral*		

FP = Financial performance

SP = Sustainability performance

(Source: Researcher's own contribution, 2023)

6 TOPIC ACTUALITY

The actuality of the topic is considered with reference to the contribution of this study to existing theories, the practical value of this study and sustainable development goals.

6.1 Contribution to the theory

As previously mentioned, a theory is a statement that predicts certain results. Malterud (2016) stated that theories are essential instruments that must be used when one interprets empirical observations. In the present study, empirical observations were interpreted within the context of multiple theories – consequently, the same results might have different interpretations, depending on whether it is before or after a crisis-time, and depending on which theory is being considered. This study will contribute to stakeholder-, stewardship-, signalling-, shareholder-, resource-based and legitimacy theory, as it will enable the refining of these theories - for example the most appropriate theory to use, or the need to adjust a theory during a crisis-time. This is since a theory might only be applicable in specific circumstances.

6.2 Practical value

It is important for companies to know the relationship between financial performance and sustainability (ESG) performance, since companies' ESG activities will impact their financial performance (Velte, 2017). The COVID-19 pandemic impacted companies' financial performance, and subsequently the relationship between financial and sustainability performance would also vary. The impact that a crisis, like COVID-19, has on the relationship between financial performance and ESG will assist companies in managing future crises, as they will understand what ESG activities support financial performance in crisis-times. Companies can use the results of this study to develop an ESG-framework that can be implemented during future crisis-periods to assist them in sustaining their financial performance and to survive the crisis. Furthermore, the interpretation of results within the context of multiple theories indicates the appropriateness of theories in certain circumstances, thereby assisting academics in identifying the most appropriate theory to use for a specific research study.

6.3 Sustainable development goals

The United Nations (UN) identified 17 Sustainable Development Goals (SDGs) which are global goals that need to be implemented by all countries to protect society (UN, 2023). These 17 goals are contained within the 2030 Agenda for Sustainable Development that was adopted in 2015 and aim to reach a sustainable future by 2030 (UN, 2023). This study supports Goal 12, Responsible Consumption and Production (specifically Target 12.6), encouragement of companies to adopt sustainable practices and to integrate sustainability information into their reporting cycle.

Estoque (2020) stated that the realisation of SDGs depends on the performance of countries and whether companies reach their SDG targets. When considering the present study, an understanding of the relationship between financial performance and ESG before and after a crisis-time can assist companies in reaching their sustainability targets. Since ESG activities relate to sustainable practices, an understanding of how these activities impact the financial performance of companies will motivate companies to invest in sustainable practices, as it will be reflected in their financial statements and integrated reports. Furthermore, by interpreting the relationship between financial performance and ESG within the context of multiple theories, companies will obtain more clarity about how this relationship is viewed from different perspectives, resulting in them paying more attention to their sustainability practices to satisfy different stakeholder needs.

7 RESEARCH DESIGN AND METHODOLOGY

The first part of the present study concentrated on objectivism, where data was analysed by the researcher. A deductive, quantitative approach was followed to execute the study. The second part of the study concentrated on subjectivism, where results were interpreted within the context of multiple theories. Here an inductive, qualitative approach was followed to execute the study. Details pertaining to the aforementioned statements follow below. Thereafter, an explanation of the literature study and the empirical study are given.

7.1 Paradigmatic assumptions

A researcher's beliefs or assumptions will certainly influence his research undertakings and findings (Klakegg, 2016). According to Guba and Lincoln (1994), paradigms are researchers' view of the world and what they assume to be the reality. Mertens (2012) indicated that paradigms give rise to philosophical and methodological assumptions and methods. Iivari and Venable (2009) stipulated that paradigmatic assumptions include ontological, epistemological and methodological assumptions, as well as research ethics. Definitions of each of these assumptions are provided below. A detailed discussion is presented in *section 3.1* of *Chapter 4 Research design and methodology*.

- Ontological assumptions refer to the illustration of reality, i.e., what the researcher is aimed at investigating (Hathcoat, 2019).
- Epistemological assumptions refer to the understanding of knowledge, how knowledge is obtained and how it is interpreted (Hathcoat, 2019; Bahari, 2010).
- Methodological assumptions relate to the research strategy that a researcher will follow (Alharahsheh & Pius, 2020).

7.2 Literature study

A literature review is the scrutiny of prior literature that is relevant to a specific topic and assists in identifying areas where further research is needed (Paul & Criado, 2020). Knopf (2006) stated that a literature review provides a summary of previous research conducted by other researchers. This enables researchers to incorporate the findings of prior research studies and to identify knowledge gaps in the research, which then guide them in forming the ground for their own research study (Denney & Tewksbury, 2012).

To conduct the literature review, various sources were consulted. This includes the review of journal articles, academic books as well as theses and dissertations. By conducting a literature review for the present study, an understanding of the following was obtained:

- The use and interpretation of financial ratio analyses (financial performance).
- The use and interpretation of ESG scores (sustainability performance).
- The expected relationship between companies' financial and sustainability performance.
- The impact that the COVID-19 pandemic had on the financial and sustainability performance of companies.
- The purpose of theoretical frameworks and the interpretation of six selected theories.

7.3 Empirical study (Method)

Empirical research refers to making observations to obtain an understanding of facts and circumstances (Patten & Galvan, 2020:6). This includes decisions regarding what, whom, how and when to observe as well as to analyse and interpret the observations to reach a conclusion.

A deductive, quantitative approach, based on objectivism, was followed for the first part of this study when the data was observed. Below follows a more detailed discussion regarding what, whom, how and when to observe, along with the analysis and interpretation of the data, as applicable in the present study.

7.3.1 Population and sampling

It is important to identify the characteristics of a study, as a well-designed research study will produce reliable results that can be interpreted by a researcher, enabling him to draw valid conclusions (Acharya *et al.*, 2013; Majid, 2018). A break-down of the present study's characteristics are as follows:

7.3.1.1 Population

Majid (2018) stated that a population is the broader spectrum that a study aims to investigate. The population consisted of companies that are listed on the JSE, specifically those trading in the industries that were most probably more severely affected by COVID-19. The financial performance and sustainability performance of companies in these industries were impacted by COVID-19 (Department: Statistics South Africa, 2020; Alsamhi *et al*, 2021; Broadstock *et al.*, 2021) – therefore, the relationship between these companies' financial and sustainability performance before and after COVID-19 are expected to differ. This includes the transport, manufacturing, trade, hospitality and communication sectors. Subsequently, the following JSE industries were considered: Basic Materials, Industrials, Consumer Goods, Consumer Services and Telecommunication. The 193 companies (Listcorp, 2023) within these industries constituted the population. Information on these companies were extracted from the Identification of Requirements for Enterprise Social Software (IRESS) database and bought from InvestVerte, an ESG-rating provider.

7.3.1.2 Sampling and sampling technique

Sampling is the selection of objects from a population that represents the population as a whole (Majid, 2018). Studies that involve the use of statistical analyses require a large sample size (Saunders *et al.*, 2019). In this study, the relationship between financial and sustainability performance was statistically analysed and therefore a scientific sample size was selected.

7.3.1.3 Inclusion and exclusion criteria

For the present study, only South African JSE listed companies that trade in the industries that were probably most severely affected by COVID-19 were included. Companies trading in industries on which COVID-19 had an insignificant impact or for which the required data is not available, were excluded from this study. The financial sector was also excluded, as companies in this sector did not only experience the "normal" impact of COVID-19 on their operations, but also experienced an increased cyber hacking risk during COVID-19 - this had a significant impact on their financial performance; other sectors were only exposed to the "normal" impact of COVID-

19 (Aldasoro *et al.*, 2021). Lastly, companies for which no ESG data was available, were excluded from this study.

7.3.2 Data collection and analysis

Financial data was extracted from the IRESS database. Sustainability data (ESG scores) was bought from InvestVerte, an ESG rating provider. A sample of 104 JSE listed companies from the sectors that were probably most severely affected by COVID-19 was selected. Data was extracted for 2017 to 2022 to analyse the association between financial performance and sustainability performance. A mixed effect regression model, by making use of Bakdash and Marusich' repeated measure correlation, was developed to test the association and to provide a basis to interpret the results within the context of multiple theories. ROE/Tobin's Q was used as a representative of financial performance, and ESG scores (in total and per pillar) represented sustainability performance. This relationship was then interpreted within the context of multiple theoretical frameworks.

8 ETHICAL CONSIDERATIONS

This study used information and data that is publicly available. This information can be extracted from companies' financial statements, integrated reports, IRESS and/or ESG reports which are published annually by JSE listed companies. Sustainability data can also be bought from ESG rating providers, like InvestVerte.

8.1 Permission and informed consent

As the information used in this study is publicly available, no permission and informed consent were needed to proceed with the study.

8.2 Anonymity

To ensure anonymity, this study's results are not associated with a specific company, but rather refer to all the companies included in this study as a whole.

9 CHAPTER OVERVIEW

The structure of the study is as follows:

Chapter 1: Introduction

The first chapter provides an introduction and the background to the present study. This includes a discussion about COVID-19, financial and sustainability performance, as well as multiple theoretical frameworks. An overview of prior studies performed is given, followed by the problem statement and the determination of research objectives. This is followed by the methodology to be adopted and the ethical considerations.

Chapter 2: Literature review: Multi-theoretical perspectives

The second chapter investigates different theories underlying firm performance, how these theories are interpreted and how they are relevant to the present study - thereby addressing theoretical objective 1.

Chapter 3: Literature review: Financial performance, sustainability performance and COVID-19

This chapter aims to conclude on theoretical objectives 2 to 4 by reviewing literature on financial performance in terms of ratio analyses, sustainability performance in terms of ESG scores and COVID-19.

Chapter 4: Research design and methodology

This chapter describes the research design and methodology that were followed in the present study. The research onion, a methodological approach to research design, consisting of six layers, was used. Chapter 4, together with Chapter 5, addresses empirical objectives 1 to 3.

Chapter 5: Results and findings

This chapter presents the results of the regression analyses conducted to identify the relationship between financial and sustainability performance before and after COVID-19. Chapter 5, together with Chapter 4, addresses empirical objectives 1 to 3.

Chapter 6: Conclusion and recommendations

The last chapter provides a high-level overview of the study. A summary of the chapters, a summary of findings (especially the interpretation of results within the context of multiple theories), conclusions, the contribution, practical value, originality, reliability and validity, creditability and trustworthiness of the study as well as the study's limitations are discussed. A final conclusion is reached, followed by recommendations for future research.

The next chapter, Chapter 2, is the first of two literature review chapters which cover the concept of theoretical frameworks.

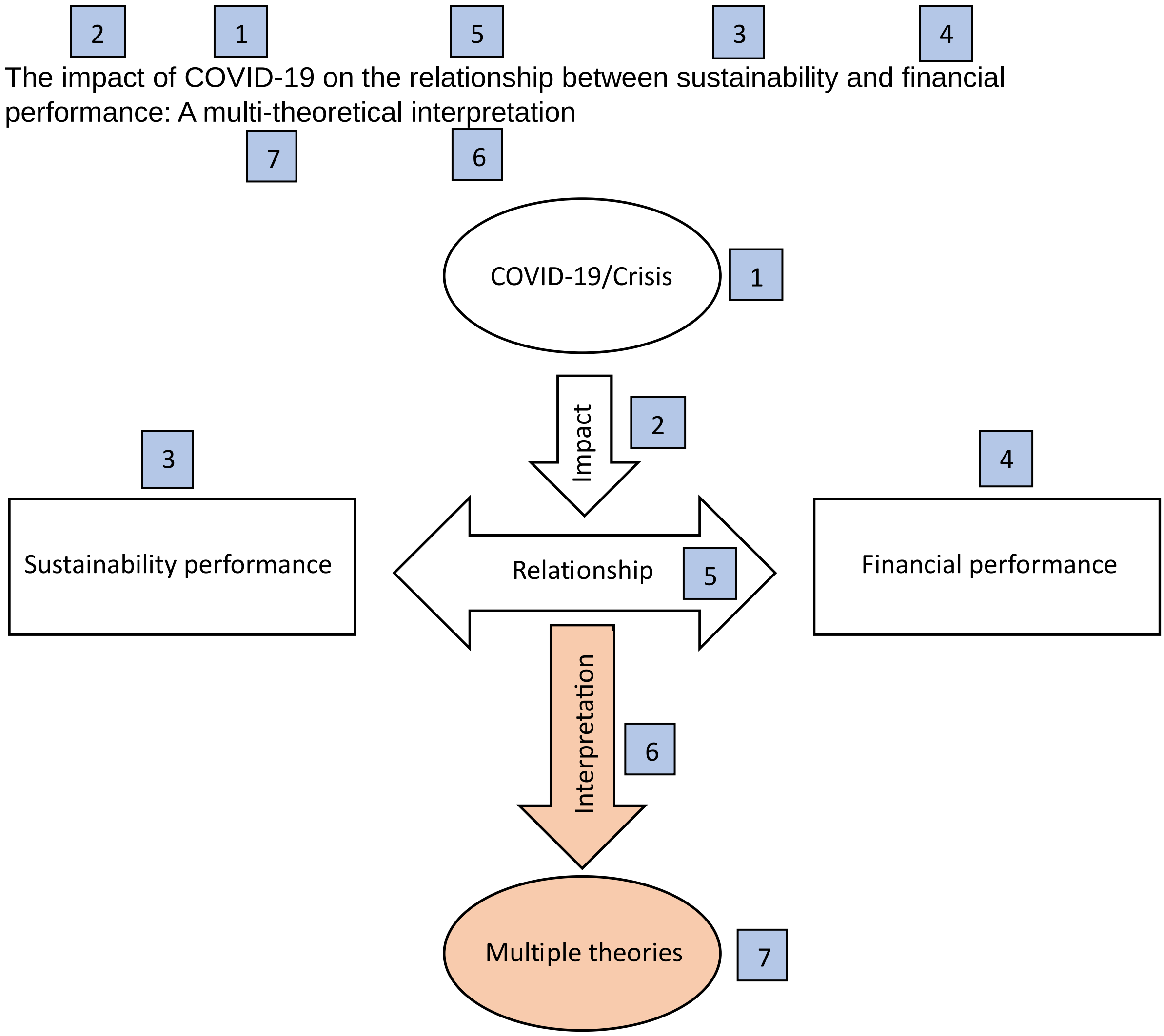
CHAPTER 2: LITERATURE REVIEW: MULTI-THEORETICAL PERSPECTIVES

1 INTRODUCTION

Chapter 1 presented an introduction to the study. The aim of this chapter is to address the first theoretical objective as set out in Chapter 1 (see *section 5.2.1*), which is to explore the use of multiple theories in explaining phenomena, including the importance of these theories and the interpretation thereof. Theoretical objective 1 is strongly linked to the study's primary objective, i.e., the interpretation of multiple theories on a specific scenario, as it provides a detailed discussion about the various theories used in research.

Chapter 2 is aimed at addressing "multi-theoretical interpretation", i.e., point 6 and 7 in the schematic diagram below.

Figure 2: Interrelationship between the terms/variables: Chapter 2



1 COVID-19 = Crisis (used as an example of a crisis)

2 Impact = “Before” and “After” – analysis

3 Sustainability performance = ESG ratings (measure)

4 Financial performance = Financial ratios (accounting-based and market-based, ROE/Tobin’s Q)

5 Relationship = Correlation and casual relationship – analysis

6 Interpretation = How different theories, as a conceptual framework, interpret the same results

7 Multiple theories = stakeholder-, stewardship-, signalling-, shareholder-, resource-based and legitimacy theory

(Source: Researcher’s own contribution, 2023)

2 IMPORTANCE AND INTERPRETATION OF THEORETICAL FRAMEWORKS

According to Kessler (2013), theories are statements that anticipate certain results, depending on the circumstances, and provide a frame wherein these results can be interpreted. Furthermore, Connelly (2014) stated that theories provide more insight about a scenario and explain the occurrence of phenomena. Reeves *et al.* (2008) said that every theoretical framework is a different lens through which a scenario is interpreted – this enables one to consider the same set of circumstances from various viewpoints. This is confirmed by Kessler (2013), stating that the interpretation of the same results will most likely differ when interpreted from different theoretical perspectives.

According to Kivunja (2018), a theory can be described as follows:

Firstly, it constitutes an argument containing different variables/concepts. Secondly, a theory provides the correlation and relationship between these variables/concepts. Lastly, a theory provides an explanation for the occurrence of certain situations and thereby enabling one to predict certain results.

Similarly, Kessler (2013) described a theoretical framework as follows:

A theoretical framework comprises factors that are interrelated. These factors can be influenced by one another, depending on the situation, and lastly a theoretical framework describes the reasons behind the occurrence of a phenomenon, i.e., why people act in a certain way and why certain actions lead to certain results.

Furthermore, a theoretical framework is an important element of any research paper, as it serves the following functions (Meriam & Simpson, cited by Rocco & Plakhotnik, 2009):

- Forms the basis of research.
- Illustrates the study's contribution to knowledge.
- Provides clarity on the study.
- Evaluates research design.
- Provides guidelines for the interpretation of results.

Kivunja (2018) confirmed the importance of theoretical frameworks by stating that a theoretical framework does not only provide structure to a research study, but also ensures an in-depth understanding of the results, especially when findings are interpreted from different theoretical perspectives.

Connelly (2014), together with Grant and Osanloo (2014), noted that the use of theoretical frameworks is crucial in any research paper as it guides the research process and provides a frame for the interpretation of findings. However, it is important that there is a definite link between the theory used and the specific scenario being studied. Unfortunately, various researchers use theories arbitrarily without considering whether the specific theory will contribute to the study and the interpretation of the study's results (Connelly, 2014). Furthermore, Grant and Osanloo (2014) stated that theories are often only briefly mentioned in research papers and seldom revisited or considered at the explanation of results. According to Lederman and Lederman (2017), researchers often toss a theoretical framework into their research papers solely because it is a prerequisite for publication, without any proper consideration of the implication of the theoretical framework chosen. This is confirmed by Green (2014), stating that theoretical frameworks are often a stumbling block for researchers, rather than a tool that provides assistance and direction to researchers.

From the above, it is evident that theoretical frameworks are key elements in research studies, not only because it provides structure and guidance, but also due to it providing a specific lens through which results can be interpreted. Despite the importance of theoretical frameworks, the use of theories is often neglected and therefore the need arises to consider the impact of different theories on a specific set of circumstances.

3 MULTIPLE THEORIES

According to Kessler (2013), there are multiple theories that can be used to explain phenomena. These multiple theories will have different interpretations of similar situations (Kessler, 2013). Hussain *et al.* (2018) noted that the use of theories in explaining the relationship between companies' financial and sustainability performance is inconsistent. Lozano *et al.* (2015) confirmed this by stating that the interpretation of multiple theories on the correlation between financial and sustainability performance, within a specified context (like COVID-19), is limited. The aforementioned statements substantiate this study's use of the relationship between financial and sustainability performance as a scenario in which multiple theoretical frameworks can be applied.

As this study is aimed at interpreting multiple theories on the same scenario, i.e., the relationship between financial and sustainability performance of South African JSE listed companies before and after COVID-19, one needs to determine the most applicable theories to be used in explaining this phenomenon. In order to determine which theories are most suitable, consideration is given to the theories used in prior research studies pertaining to the same phenomenon.

3.1 Theories – prior research

Prior research studies, aimed at explaining the relationship between financial and sustainability performance, made use of diverse theories in explaining this phenomenon. A discussion about these studies follows below.

Firstly, Hussain *et al.* (2018) investigated 31 studies that examined the relationship between financial and sustainability performance in different countries. Of the 31 studies, nine studies were performed from the perspective of stakeholder theory, three studies used agency theory, three studies used resource-based theory, two studies used efficient-market theory, two studies used signalling theory, one study used trade-off theory, and the remaining 11 studies did not make use of any specific theoretical framework. It is thus evident that there is not only an inconsistent use of theories, but also a lack of interpretation and application of theoretical frameworks in prior research studies.

Yoo *et al.* (2021), Beloskar and Rao (2022), Saygili *et al.* (2021), Velte (2017), Kalia and Aggarwal (2023), as well as Zhao *et al.* (2018), made use of stakeholder theory to explain the impact that ESG activities have on companies' financial performance. It was concluded that a company's sustainability investments are important for stakeholders, resulting in stakeholders rather supporting companies with high ESG scores than companies with low or no ESG scores. Fatemi *et al*. (2018) expanded on the above by also considering resource-based theory, together with stakeholder theory, to analyse how a company's value is impacted by ESG activities and disclosures. Fatemi *et al.* (2018) concluded that the value of firms with strong ESG activities are higher than those with poor ESG activities, since the stakeholders consider a company's use of resources in evaluating its performance. Hwang *et al.* (2021) considered the relationship between foreign companies' ESG ratings and financial performance during COVID-19 from legitimacy and stakeholder theories' perspectives, whereas Mans-Kemp and Van Der Lugt (2020) used only legitimacy theory when they concluded that a company's sustainability performance increases its financial performance – this was due to effective ESG management. In another study, Ahmad *et al.* (2021) made use of four theoretical frameworks in interpreting the relationship between UK firms' ESG and financial activities, namely stakeholder-, resource-based-, institutional- and legitimacy theory, whereas Yuen *et al.* (2022) briefly mentioned stakeholder-, shared value-, legitimacy and resource-based theory in explaining the impact that ESG strategies had on the performance of the banking industry during the COVID-19 pandemic.

Naimy *et al.* (2021) evaluated the impact of ESG activities on the corporate financial performance of East Asian firms through the lens of shareholder theory, whereas, Carnini Pulino *et al.* (2022) used signalling theory in concluding that there is a definite relationship between financial performance and ESG, since stakeholders are attentive to companies' ESG activities – i.e., companies with high ESG scores signal a good performance to stakeholders, which in return increases the company's profits and financial performance. Similar results were obtained in studies performed by Lee *et al.* (2022), Sinha Ray and Goel (2023) as well as Zheng *et al.* (2022), where it was found that ESG activities signal to the market whether a firm is operating efficiently or not, which will in return determine the support the firm receives from the market – i.e., supporting signalling theory. Lopez-de-Silanes *et al.* (2020), together with Rodriguez-Fernandez (2016), confirmed that stewardship impacts a company's financial and sustainability performance and subsequently also the relationship between them.

Other studies, including studies performed by Zhao *et al.* (2018) and Yoo *et al.* (2021), who considered the impact that sustainability performance has on a company's financial performance, did not include a theoretical framework in their research papers. Furthermore, the results were not interpreted within the context of a specified theory.

From the above it is evident that different studies used various theoretical frameworks in interpreting their results. Some studies only briefly mentioned a theoretical framework, whereas other studies neglected including a reference to a theory in their research papers. With this in mind, one can now consider which theories to include in the present study.

3.2 Theories – present study

After consideration of the theoretical frameworks used in prior research studies, it is evident that stakeholder-, stewardship-, signalling-, shareholder-, resource-based and legitimacy theory are mostly used in interpreting the relationship between companies' sustainability and financial performance. Subsequently, the present study used these six theories to interpret the study's outcomes, i.e., the relationship between financial and sustainability performance before and after COVID-19. A detailed discussion about each of these theories are provided below.

3.2.1 Stakeholder theory

Stakeholder theory is a well-known and widely used theory that was initiated by R. Edward Freeman in 1984 (Freeman, 1984). A stakeholder is defined as an individual or a group of individuals who have an interest in a company and thus affected by the actions of the company (Hefer & Walker, 2020). Similarly, the company is affected by the actions of these individuals or group of individuals, as the success of the company depends on the actions of these stakeholders, for example customers that support the company or employees that are involved in the company's operations (Kessler, 2013). According to Rodriguez-Fernandez (2016), different stakeholders expect different actions from a company in order to satisfy their specific needs. It is therefore important for companies to pay careful attention to these various needs, as it will determine whether stakeholder-satisfaction is achieved or not. Subsequently, stakeholder theory states that, when companies act in the best interest of various stakeholders (customers, employees, suppliers, financiers etc.), stakeholder-satisfaction is achieved - which increases companies' value (Kessler, 2013).

Freeman and Dmytriyev (2017) stated that one of the most important responsibilities a company has towards its stakeholders, is in terms of its sustainability actions, i.e., whether the company's operations contribute to the society and the environment. Subsequently, there is a definite relationship between a company's sustainability performance and the support they receive from their stakeholders, depending on the level of stakeholder-satisfaction achieved by the company (Freeman & Dmytriyev, 2017). Furthermore, Rodriguez-Fernandez (2016) stated that, since a company's sustainability operations attract stakeholders (e.g., customers), it is expected that the company's financial performance will increase in line with the increase in stakeholder-satisfaction, which corroborates with stakeholder theory. Ultimately, stakeholder theory specifies that a firm's performance depends on how the firm treats its stakeholders and whether these stakeholders are satisfied with the firm's actions (Kessler, 2013).

Companies must not only create value for its shareholders, but for all its stakeholders.

3.2.2 Stewardship theory

Another theory used in explaining a phenomenon is stewardship theory, which was developed by L. Donaldson and J.H. Davis in 1991 (Donaldson & Davis, 1991). The word "steward" refers to a person appointed in a managerial position, whereas stewardship pertains to the supervision and/or management conducted by the steward (Kessler, 2013). Subsequently, stewardship theory explains the impact that a company's managers and leaders (i.e., stewards) have on its performance – if managers and leaders are primarily focused on serving the company and its goals and when they are not concerned about gaining personal advantages, the company is more likely to perform well (Keay, 2017). Furthermore, Kessler (2013) stated that stewards intend to prioritise the interest of the company and concentrate on contributing to the company's goals and objectives, with little consideration of possible personal benefits.

According to Nijhof *et al.* (2018), managers and leaders, like the Chief Executive Officer (CEO) of a company, have an impact on a company's sustainability performance since they are involved in the sustainability policy and strategy setting processes. McCuddy and Pirie (2007) stated that it is important for managers to base their decisions on stewardship values and that stewardship must be incorporated in all operational and financial decision-making processes. This is confirmed by Kessler (2013) who argued that when managers are faced with a decision, they must rely on stewardship values and, as stewards, they will make a decision that is primarily beneficial for the company – which all comes down to stewardship theory.

Managers and leaders, when given a decision, will serve the company without considering any possible self-interests.

3.2.3 Signalling theory

The third theory that was considered in this study, is signalling theory – a theory that was initiated by Michael Spence in 1973 (Spence, 1973). This theory aims at explaining the impact that a company's actions have on its stakeholders and their decisions (Yasar *et al.*, 2020). According to Drover *et al.* (2018), a company's actions send messages, i.e., signals, to stakeholders about the effectiveness of the company's operations. Yasar *et al.* (2020) elaborated by stating that signals include, amongst others, a company's pricing schemes, labour contracts, reputation and public announcements. These signals are then interpreted by the market – either as positive or negative – and influence stakeholders' behaviour (Bergh *et al.*, 2014). Drover *et al.* (2018), supported by Yasar *et al.* (2020), stated that negative signals from a company have a greater impact on stakeholders' subsequent behaviour than positive signals; it is therefore crucial for companies to ensure that their actions send positive signals out into the market.

According to Moratis (2018), it is important for companies to illustrate to their stakeholders that they contribute to sustainability – companies that adopt sustainability practices signal to the market their commitment to sustainable development. One way that companies illustrate their commitment to sustainability is through complying with sustainability standards, such as ISO 26000 (which provides guidance in implementing sustainability practices), as compliance with this standard sends a positive signal to stakeholders: the company is devoted to investing in sustainable operations (Moratis, 2018). Furthermore, Yasar *et al.* (2020) stated that sustainability is a powerful signal about the effectiveness of a company's operations and will impact the economic decisions made by stakeholders, which is in line with signalling theory.

Companies' actions signal to the market information about their performance.

3.2.4 Shareholder theory

Shareholder theory was introduced by Milton Friedman in 1970 (Friedman, 1970). A shareholder is defined as an individual or group/company that invested funds in another company through the purchase of shares; subsequently, shareholders are considered to be the owners of the company in which they invested (O'Connell & Ward, 2020). According to Clarke and Friedman (2016), the ultimate objective of a company is to maximise shareholder-wealth. O'Connell and Ward (2020) stated that shareholder-wealth is maximised by increasing a company's share price and dividends per share. Shareholders invest in companies in order to receive returns – if the share price and dividend per share increase, shareholders' returns increase and shareholder-wealth is maximised, resulting in satisfied shareholders (How *et al.*, 2019). Shareholder theory thus states that, in order for companies to excel, shareholders' interests must be prioritised above those of other stakeholders (O'Connell & Ward, 2020).

According to Janah and Sassi (2021), sustainability operations have a negative impact on a company's financial performance as it reduces profits and the subsequent dividend per share, and as a result, shareholder-wealth is not maximised. Similarly, Zumente and Bistrova (2021) stated that companies' financial objectives must be short-term, i.e., maximising shareholder-wealth by increasing profits in the short run. However, sustainability operations come at a cost to companies and subsequently these short-term financial objectives are not achieved. Furthermore, Janah and Sassi (2021) noted that when companies invest in sustainability operations, there is a reduction in financial performance as shareholders withdraw their support to the company since they do not receive the expected returns – a clear illustration of shareholder theory.

Companies must maximise profits to increase the returns that shareholders, the ultimate owners of companies, receive.

3.2.5 Resource-based theory

Another theory used in describing phenomena is resource-based theory – a theory that was initiated by Edith Penrose in 1959 (Kessler, 2013). Penrose identified the significance of the resources at a company's disposal: these resources can "make or break" a company (Lockett *et al.*, 2009). Similarly, Kessler (2013) stated that companies are dependent on the resources employed, as these resources form the foundation on which a company is built and that the quality of a company's resources drives their financial performance. Furthermore, Barney (1991) identified four criteria against which the quality of resources can be measured: resources must be "valuable", "rare", "inimitable" and "non-substitutable." Subsequently, the resource-based theory states that when companies employ valuable and unique resources, they obtain a competitive advantage in the market (Lockett *et al.*, 2009).

According to Kessler (2013), the availability of valuable and unique resources itself does not provide a company with a competitive advantage – it all depends on how the company utilises these resources. Waddock and Graves (1997) stated that companies with good financial performance are usually those companies that also have high investments in sustainability operations. Therefore, it is beneficial for companies to dedicate some of their resources (such as excess capital) to sustainability investments. In addition, Zhou *et al.* (2022) also noted that companies' sustainability investments are valuable resources that contribute to increased financial performance – this is because companies that invest in sustainability operations have a competitive advantage in their respective industries and obtain more financial benefits than the other companies in the industry. The aforementioned statements provide clear evidence that it is crucial for companies to obtain and apply valuable resources in an effective manner; thus, supporting resource-based theory.

Valuable resources provide companies with a competitive advantage in the market.

3.2.6 Legitimacy theory

The last theory considered in this study is legitimacy theory - a theory that was propounded by Dowling and Pfeffer in 1975 (Dowling & Pfeffer, 1975). Legitimacy pertains to the judgements made by an individual or group and the legitimacy theory specifically focuses on the interaction between a company and society, i.e., whether the society approves of the judgements made by a company (Fernando & Stewart, 2014). Furthermore, Deegan (2002) stated that companies are concerned with obtaining approval for their actions from society as a whole and not from individuals within the society. Companies are thus required to satisfy the overall society by complying with the general norms, values and beliefs of the society.

Schiopoiu Burlea and Popa (2013) noted that, in order for companies to ensure that they adhere to the norms, values and beliefs of the society, they must publicly disclose their social and environmental activities. Similarly, Olateju *et al.* (2021) stated that companies are more likely to obtain legitimacy status, i.e., the approval of society, when they invest in sustainability operations. According to Fernando and Stewart (2014), companies tend to disclose the positive results from their sustainability operations, with little or no disclosure of any negative outcomes. This is in line with legitimacy theory as the company wants to satisfy, and not disappoint, the expectations of society.

Companies structure their actions in such a way that it is acceptable for the broader society.

4 SUMMARY

Chapter 2 was aimed at addressing the first theoretical objective as set out in Chapter 1 (see *section 5.2.1*), which is to explore the use of multiple theories in explaining phenomena, including the importance of these theories and the interpretation thereof.

This chapter investigated the importance and interpretation of theoretical frameworks: theoretical frameworks anchor research papers and provide assistance and direction to researchers. Unfortunately, theoretical frameworks are often inadequately used in research papers – it is thus necessary to consider the impact that different theoretical frameworks have on the same set of circumstances, since each theoretical framework is a different lens through which a scenario can be observed.

There are multiple theories that can be used in interpreting scenarios and results. In respect of the relationship between the financial and sustainability performance of South African JSE listed companies before and after COVID-19, the following theoretical frameworks, if any, were mostly used: stakeholder-, stewardship-, signalling-, shareholder-, resource-based and legitimacy theory. Subsequently, all of these theories were considered when the present study's results were interpreted.

Stakeholder theory states that a company's value will increase when it acts in the best interest of its various stakeholders. Stewardship theory is concerned with how a company is managed – a company's performance will increase if its managers prioritise the interest of the company, with little to no consideration of personal benefits that can be obtained. In terms of signalling theory, a company's actions send a signal to its stakeholders which will determine whether stakeholders will continue to support, or withdraw their support from the company. Shareholder theory states that the main objective of a company must be to satisfy shareholders by maximising profits in order to increase the dividends received by shareholders. Resource-based theory states that the performance of a company is dependent on the effective use of valuable and unique resources as this gives companies a competitive advantage. Lastly, legitimacy theory is concerned with how the society views a company – if a company adheres to the norms, values and beliefs of the society, the company is more likely to be supported by the society, and if not, the society will withdraw their support from the company.

Chapter 2 was the first literature review chapter. The second literature review chapter, Chapter 3, covers the concepts of financial performance, sustainability performance and COVID-19.

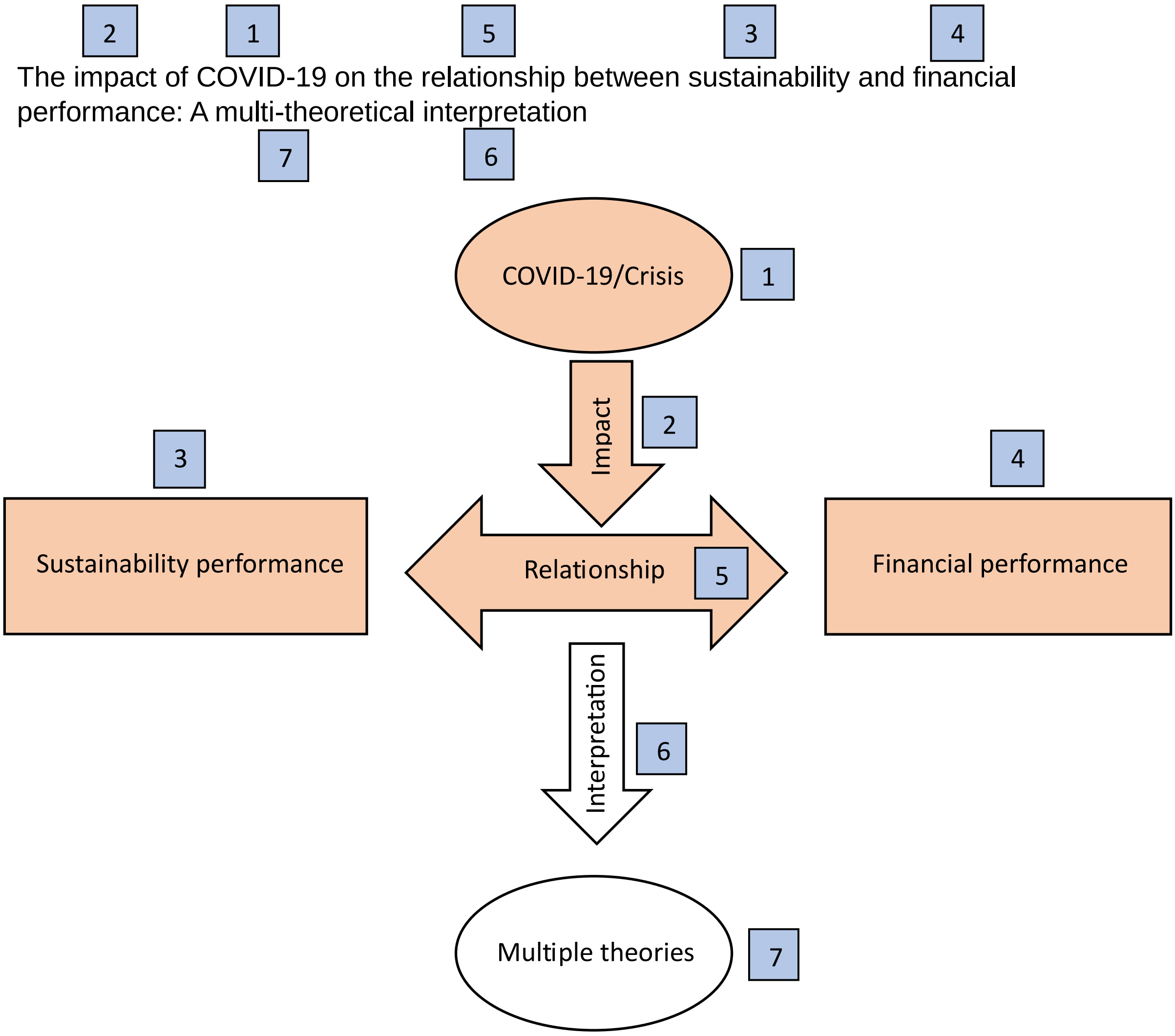
CHAPTER 3: LITERATURE REVIEW: FINANCIAL PERFORMANCE, SUSTAINABILITY PERFORMANCE AND COVID-19

1 INTRODUCTION

The previous chapter addressed the first theoretical objective through conducting a literature review about the importance and interpretation of multiple theoretical frameworks. This chapter is aimed at underpinning the key concepts of this study by providing a review of relevant literature. The purpose of Chapter 3 is to address the last three theoretical objectives as set out in Chapter 1 (see *section 5.2.1*), which is to examine how financial performance is evaluated, how sustainability performance is measured and how COVID-19 impacted the financial performance of JSE listed companies. This is followed by a discussion of the relationship between financial and sustainability performance within the context of a crisis (COVID-19). It is important to note that these concepts are used in creating a scenario in which the interpretation of multiple theoretical frameworks (primary objective) can be considered.

Chapter 3 is aimed at addressing points 1 to 5 in the schematic diagram below.

Figure 3: Interrelationship between the terms/variables: Chapter 3



1 COVID-19 = Crisis (used as an example of a crisis)

2 Impact = "Before" and "After" – analysis

3 Sustainability performance = ESG ratings (measure)

4 Financial performance = Financial ratios (accounting-based and market-based, ROE/Tobin')

5 Relationship = Correlation and casual relationship – analysis

6 Interpretation = How different theories, as a conceptual framework, interpret the same results

7 Multiple theories = stakeholder-, stewardship-, signalling-, shareholder-, resource-based and legitimacy theory

(Source: Researcher's own contribution, 2023)

2 Financial performance (Theoretical objective 2)

Financial performance provides an overview of the effectiveness and efficiency of a company's operations during a specific timeframe (Kusumawardani *et al.,* 2021). Financial performance can be evaluated by making use of financial ratio analyses (Kusumawardani *et al.,* 2021; Hefer & Walker, 2020). Hefer and Walker (2020) also noted that one of the main reasons for making use of financial ratios, is to ensure comparability – that is, comparing a company's current results to prior results as well as to the industry. This is confirmed by Correia (2019) and Salmi and Martikainen (1994), stating that financial ratios are only useful when compared to prior ratios, as this will indicate whether the measures implemented by companies to improve their profitability were effective or not. This information is crucial for stakeholders since the financial performance of a company drives the decisions made by stakeholders, for example potential investors – this is evident in the stakeholder theory (Almagtome & Abbas, 2020). Furthermore, financial ratios assist management in identifying problem areas within the company and its operations, which will be evident from deteriorating financial ratios – this links to stewardship theory where management acts in the best interest of the company (Faello, 2015). In addition to evaluating a company's performance, financial ratios can also be used to forecast the future performance or the possible collapse of a firm (Hefer & Walker, 2020). From the aforementioned, it is thus evident that financial ratios have various purposes and is especially an important measure of financial performance (Batchimeg, 2017).

When specifically referring to studies that investigated the relationship between the financial and sustainability performance of companies, Velte (2017) used return on assets (ROA) (an accounting-based measure) and Tobin's Q (a market-based measure) to measure firms' financial performance. The same approach was followed by Saygili *et al.* (2021) and Zhou *et al.* (2022), who investigated the impact of ESG activities on the financial performance of Turkish companies and Chinese companies respectively. Rossi *et al.* (2021) used ROA to measure European companies' financial performance when evaluating the effect that sustainability operations had on these companies' performance. Mardini (2022) investigated the impact that ESG had on the financial performance of firms in various countries and used Tobin's Q, ROA and ROE as the financial performance measure. Hussain *et al.* (2018) considered various studies that investigated the relationship between financial and sustainability performance, and specifically identified what indicators were used to measure companies' financial performance. Of the 31 studies that Hussain *et al.* (2018) considered in his empirical literature review, 13 made use of ROA and/or Tobin's Q as a measure of a company's performance, whereas only four studies measured financial performance through ROE. Cuong Pham *et al.* (2021) expanded on the above by using Tobin's Q, earnings yield (YE), ROA, ROE and Return on Capital Employed (ROCE) to measure the financial performance of Swedish companies when investigating the correlation between these companies' financial and sustainability performance. Halid *et al.* (2023) considered the relationship between firm performance and sustainability of 11 studies and also identified which financial performance indicators were used. Of the 11 studies, 8 studies made use of ROA as an indicator of firms' financial performance, whereas only two studies used ROE.

The choice of which ratio to use in measuring financial performance is often arbitrary, as researchers refer to the most commonly used ratios in prior research studies (Saygili *et al.*, 2021). From the above, it is evident that ROA is commonly used amongst researchers as a measure of firms' financial performance (Strouhal *et al.*, 2018; Jewell & Mankin, 2011). One of the pitfalls of using ROA as a financial performance indicator is that the ratio might be biased when one considers various industries (as the case is with this study, see *Chapter 4, section 3.6.1*), since the period of the assets employed will not coincide (Galant & Cadez, 2017). Furthermore, Jewell and Mankin (2011) identified eleven different formulas/methods to compute ROA, which can impact one's interpretation of the results, depending on which ratio was used. Subsequently, researchers tend to use multiple financial performance measures to address possible inconsistencies (Galant & Cadez, 2017). Since ROE comprises various ratios, as evident from the Du Pont model, multiple measures of financial performance are incorporated within this one ratio, which makes it an ideal measure of a company's financial performance (Kijewska, 2016).

2.1 Measuring financial performance

Financial performance can be measured by making use of either accounting figures or market figures, i.e., accounting-based or market-based. Both these measures are discussed below.

2.1.1 Accounting-based measure of financial performance

Accounting financial ratios can be categorised into different classes, which include liquidity, profitability, cash flow, asset management, debt management and market value ratios (Correia, 2019; Marx, 2019). Market value ratios are an indication of the value of a firm's shares and are influenced by other classes of ratios (liquidity, profitability, asset management and debt management ratios). The better these ratios are, the better the market value of a company will be, as investors will place a higher value on the firm's shares (Correia, 2019). The impact that different ratios have on a market ratio is evident from the Du Pont model (see *section 2.1.1.1*) - a model that makes use of return on equity (ROE), a market value ratio, as a measure of financial performance (Correia, 2019; Liesz, 2002). According to Panigrahi and Vachhani (2021), ROE is a very important accounting ratio to be used in measuring a firm's overall financial performance. This is confirmed by Liesz (2002), stating that, since ROE comprises various different ratios (each impacted by different business aspects), the financial performance of a company will be best evident from its ROE. Davit *et al.* (2016) further stated that ROE indicates whether a company maximises wealth for its shareholders or not (which supports shareholder theory) and is therefore an important indicator of a company's performance. When considering the aforementioned, together with the limited utilisation of ROE in prior studies investigating the relationship between sustainability and financial performance (see *section 2*), this study used ROE as a measure of financial performance. ROE, in terms of the Du Pont model, is discussed below.

2.1.1.1 ROE: Du Pont model

Kijewska (2016) stated that, in its basic form, ROE measures how successful a company manages its shareholders' funds in order to generate profits. This is evident when considering the base formula of calculating ROE (Correia, 2019; Kijewska, 2016):

$$ROE = \frac{Net\ profit}{Ordinary\ equity}$$

- Net profit (income) represents a company's net earnings after interest and taxes – this is the profit that is attributable to ordinary shareholders (Correia, 2019).
- Ordinary (Shareholders) equity represents a company's equity capital, i.e., the total funds that shareholders contributed to a company and on which they expect a return (Davit *et al.*, 2016; Kijewska, 2016).

A high ROE is an indication that a company is successful in generating profits from the funds invested by shareholders, thereby maximising shareholder wealth which supports the shareholder theory (Kijewska, 2016). Furthermore, when ROE increases while shareholders' equity remains unchanged, it indicates that a company is not dependent on shareholders' funds to generate profits and is thus financially stable (Kijewska, 2016).

As previously mentioned, ROE is impacted by different financial ratios (Correia, 2019; Davit *et al.*, 2016):

$$ROE = ROA^1 \times FLM^2$$

where:

^{1}*ROA = Return on assets*

^{2}*FLM = Financial Leverage Multiplier*

To provide more clarity on the above, a break-down of the relationship between the financial ratios is provided below (Davit *et al.*, 2016).

[1] *Return on assets (ROA)*

The first ratio used in calculating ROE is ROA, which indicates how profitable a company is with reference to the assets employed, i.e., whether a company uses its resources (assets) effectively to generate profits, which links to resource-based theory (Hefer & Walker, 2020). "Profits" can refer to net profit, earnings before interest and tax (EBIT), or earnings before interest but after tax (EBIAT); however, within the context of the Du Pont model, net profit is used to calculate ROA (Skae, 2022):

$$ROA = \frac{Net\ profit}{Total\ assets}$$

When considering the above formula, ROA can be further broken down as follows (Correia, 2019):

$$ROA = Net\ profit\ margin\ \times Total\ asset\ turnover$$

- Net profit margin is a profitability indicator and measures the profit after tax made by a company as a percentage of revenue generated (David *et al.*, 2016).
- Total asset turnover is an asset management ratio which indicates how effective a company employs its assets in generating revenue (Hefer & Walker, 2020).

Furthermore, net profit margin and total asset turnover comprise the following ratios (Davit *et al.*, 2016):

$$Net\ profit\ margin = \frac{Net\ profit}{Sales}$$

$$Total\ asset\ turnover = \frac{Sales}{Total\ assets}$$

- Net profit (income) represents a company's net earnings after interest and taxes – this is the profit that is attributable to ordinary shareholders (Correia, 2019).
- Sales represent the total revenue generated by a company during a period, before deducting any expenses (Correia, 2019).
- Total assets represent the assets a company uses in generating profits, which can be either total assets employed or average assets employed (Jewell & Mankin, 2011).

[2] *Financial Leverage Multiplier (FLM)*

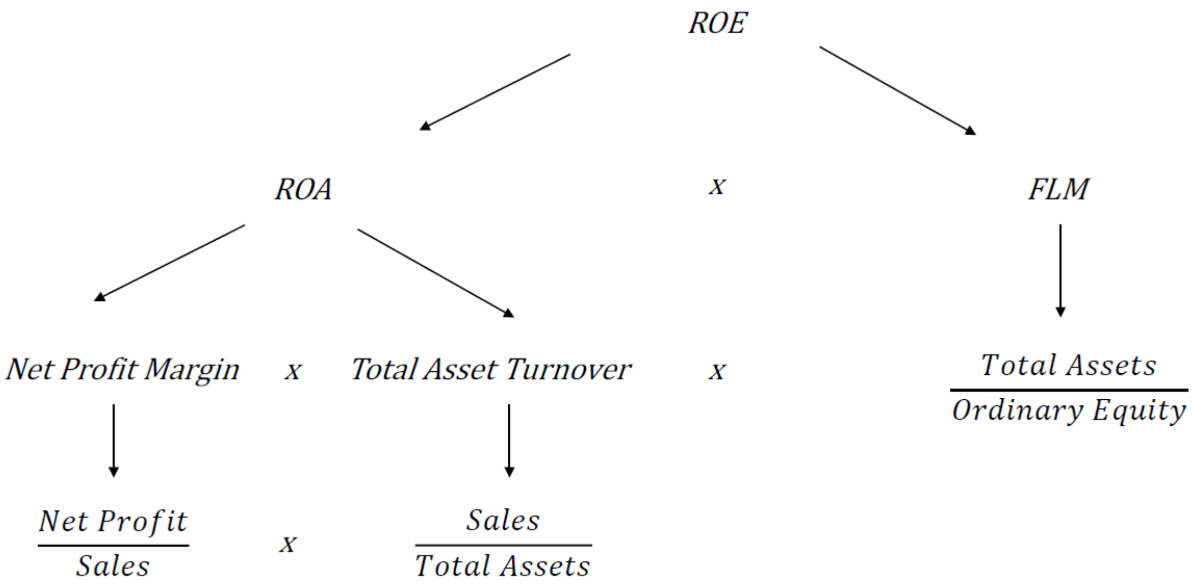
The second ratio used in calculating ROE is the FLM which, within the Du Pont model, specifically pertains to the portion of debt within a company's capital structure (David *et al*., 2016; Warrad & Nassar, 2017). Debt-financing is less costly than equity-financing, one of the reasons being that interest is tax deductible while dividends do not have such tax-benefits (Correia, 2019). However, the use of more debt increases a company's risk, specifically the risk of not being able to make interest payments as and when required (Skae, 2022). The FLM inspects how debt is used to finance assets - the higher the FLM, the more debt a company uses, which subsequently also increases a company's financial risk (Seens, 2013). FLM can be calculated as follows (Hefer & Walker, 2020):

$$FLM = \frac{Total\ assets}{Ordinary\ equity}$$

- Total assets represent the assets a company uses in generating profits, which can be either total assets employed or average assets employed (Jewell & Mankin, 2011).
- Ordinary (Shareholders) equity represents a company's equity capital, i.e., the total funds that shareholders contributed to a company and on which they expect a return (Davit *et al.*, 2016; Kijewska, 2016).

From the above ratios, i.e., the Du Pont model, it is evident that ROE is impacted by various aspects of a company, namely profitability, asset utilisation and leverage – this makes ROE one of the most important ratios to consider when evaluating a company's financial performance (David *et al.*, 2016). After consideration of the above, the Du Pont model can be illustrated as follows (Correia, 2019):

Figure 4: Du Pont model: ROE



(Source: Correia, 2019)

2.1.2 Market-based measure of financial performance

Market-based measures of financial performance make use of market figures to measure performance. Tobin's Q is a ratio that evaluates the success of a company from an investment perspective (i.e., whether a company is overvalued or undervalued) and is used by potential investors to predict the value of a company's growth and future investments (Fu *et al.*, 2016). Tobin's Q focuses on the market value and the replacement value of a company and can be calculated as follows (Fu *et al.*, 2016):

$$Tobin's\ Q = \frac{Market\ value}{Total\ asset\ value}$$

- Market value refers to the sum of the market value of a company's shares (issued shares multiplied by the value per share on the stock exchange) and the market value of a company's debt (Kyere & Ausloos, 2021).
- Total asset value refers to the replacement costs of assets, i.e., present value of costs to be incurred to replace the total assets of a company (Fu *et al.*, 2016).

After considering both accounting-based and market-based measures of financial performance, the present study used ROE as an accounting-based measure of financial performance and, for affirmation, Tobin's Q was also incorporated as a market-based measure of companies' financial performance.

3 SUSTAINABILITY PERFORMANCE (THEORETICAL OBJECTIVE 3)

Sustainability is a crucial matter for companies worldwide (Aggarwal, 2013). Sustainability pertains to fulfilling the needs of today's generation without sacrificing the ability of future generations to fulfil their needs (Alshehhi *et al*., 2018). Companies can implement sustainability in multiple different ways which include, inter alia, recycling to protect the environment, providing support groups for employees and being involved in community projects (Gimenez *et al.*, 2012). Stakeholders are concerned whether companies contribute to sustainability or not (Arvidsson & Dumay, 2021). Therefore, most companies focus on implementing sustainable operations, as sustainability has become a prerequisite for companies to maintain a competitive advantage (Nicolăescu *et al.*, 2015). Companies report on their sustainability performance within their integrated reports – a report that reflects a company's financial and non-financial performance for a period under review (Abeysekera, 2012; Vaz, 2016). According to the IIRC (2013), non-financial performance pertains to sustainability performance which includes a company's environmental, social and governance performance. There are various ways in which a company's sustainability performance can be measured (Sarker *et al.*, 2021). This study used ESG scores in measuring sustainability performance. A description of some measurement methods considered, i.e., the triple bottom line, balanced scorecard and ESG scores, including the reasoning behind using ESG scores, are provided below.

3.1 Triple bottom line

The Triple bottom line (TBL) (also referred to as the three P's) is a framework that measures a company's sustainability performance in terms of three areas: profit, people, planet (Pereira & Martins, 2021). Alhaddi (2015) stated that the TBL consists of the following three lines:

- Economic line (Profit) – This line considers the impact of a company on the economy, i.e., is the company profitable (Elkington, 1997).
- Social line (People) – This line represents a company's contribution to the community, i.e., is the company's operations beneficial to the society and its people (Elkington, 1997).
- Environmental line – This line considers companies' impact on the environment, i.e., is the company mindful about, for example, its usage of natural resources and greenhouse gas emissions (Elkington, 1997).

Sridhar and Jones (2012) stated that the measurement of sustainability performance in terms of the TBL framework is complex. Sridhar and Jones (2012) elaborated by stating that there is limited integration of the economic, social and environmental lines within this framework. According to Ferrel (2021), when the TBL framework is used in measuring sustainability, it mostly focuses on a company's financial performance with little consideration of the social and environmental element of this framework. Ferrel (2021) suggested that the use of an ESG framework in measuring sustainability performance will be more accurate, as there is a definite relationship between ESG activities and profitability.

3.2 Balanced Scorecard

Another method of measuring sustainability is the Balanced Scorecard (BSC) (Sarker *et al.*, 2021). Sarker *et al.* (2021) stated that the BSC simultaneously evaluates a company's financial and non-financial performance. The BSC was developed by Robert S. Kaplan and David P. Norton in 1992 and considers three perspectives for evaluating performance, namely customer-, internal process- and a learning and growth-perspective (Kaplan & Norton, 1992). To specifically incorporate sustainability into the BSC, the Sustainable Balanced Scorecard (SBSC) was developed. This new framework for performance evaluation also includes sustainability objectives relating to social, environmental and ethical issues (Mio *et al.*, 2021). According to Aryani *et al.* (2020) and Mio *et al.* (2021), the BSC is more frequently used as an internal control tool for decision-making purposes and for management to evaluate internal performance. Hristov *et al.* (2019) stated that the SBSC sets out environmental and social objectives for a company, thereby motivating sustainability within the company. Furthermore, Bento *et al.* (2019) noted that the use of the SBSC to evaluate performance results in prejudice as it is compiled internally. It is thus evident that the BSC and the SBSC are mostly used for internal reporting and to evaluate the internal performance of companies; therefore, when considering the wider impact of a companies' sustainability operations within an industry, other measures, like ESG scores, will be more suitable (Clément *et al*., 2022).

3.3 ESG scores

A company's sustainability performance can be measured by making use of ESG scores whereby a company's environmental (E), social (S) and governance (G) activities are evaluated, i.e., the three pillars of ESG (Jang *et al.*, 2020). An ESG score is a numerical score or a letter rating that provides a quantitative measure of a company's sustainability activities (Clément *et al.*, 2022). ESG scores can be obtained from ESG rating providers. It provides an overall rating of a company's sustainability operations and can be used to compare the sustainability performance of companies in different industries (Rajesh, 2020). Another benefit of ESG scores is that it incorporates a company's downside risk (Jang *et al.*, 2020). Companies with an ESG score are considered to be superior to those without an ESG score – this is because ESG scores signal to stakeholders that a company's operations are sustainable, thereby attracting stakeholders (Clément *et al.*, 2022; Arvidsson & Dumay, 2021). Consequently, since stakeholders are more likely to support firms with a high ESG score, these firms' financial performance outperform those of firms with low or no ESG scores (Clément *et al.*, 2022). According to Dincă *et al.* (2022), it is important to analyse each of the three ESG pillars separately, as they can have opposite impacts on a company's performance. A short description of each of the three pillars of an ESG score is provided below.

- Environmental score

The Environmental score (E-score) provides a rating to a company based on its environmental impact which includes, inter alia, a company's carbon emissions, water usage and waste production (Bissoondoyal-Bheenick *et al.*, 202; Amel-Zadeh & Serafeim, 2018).

- Social score

The Social score (S-score) rates a company based on its social impact. i.e., the influence of the company's actions on the community (Bissoondoyal-Bheenick *et al.*, 2023). The S-score pertains to a company's involvement with its people, for example its actions towards employees and customers (Amel-Zadeh & Serafeim, 2018).

- Governance score

The Governance score (G-score) provides a rating to a company based on how the company is governed, which includes, inter alia, the board of directors' actions, leadership, political situations as well as anti-corruption schemes implemented by the company (Bissoondoyal-Bheenick *et al.*, 2023; Amel-Zadeh & Serafeim, 2018).

ESG rating providers inspect companies' disclosures (e.g. integrated reports), conduct interviews with those charged with governance and analyse and compare their findings to other companies and the industry in order to generate an E-score, S-score and G-score - which together constitute an overall ESG score (Miller, 2023). According to D'Amato *et al*. (2022), ESG-scoring is one of the most favoured methods to measure a firm's sustainability performance. This is confirmed by Halid *et al.* (2023), stating that ESG scores are a modernised way of evaluating a firm's performance. Furthermore, since ESG scores are compiled by independent, external ESG-rating providers, it is a reliable method to use to measure sustainability performance (Halid *et al.*, 2023). Subsequently, this study used ESG scores to measure sustainability performance.

4 COVID-19 (THEORETICAL OBJECTIVE 4)

The COVID-19 pandemic imposed many threats to companies worldwide (Almeida *et al.*, 2020). The pandemic also had a severe impact on the performance of South African companies (Lone & Ahmad, 2020; Almeida *et al.*, 2020). According to Alsamhi *et al.* (2021), the transport, mining, manufacturing, trade, hospitality and communications sectors were mostly threatened by COVID-19. Within the South African context, these sectors represent the following JSE industries: Basic

Materials, Industrials, Consumer Goods, Consumer Services and Telecommunication (Department: Statistics South Africa, 2020). Various earlier research studies confirmed that COVID-19 impacted the performance of South African companies in the aforementioned industries. A more detailed discussion of these studies follows below.

Ede *et al.* (2021), together with Dube (2021), investigated the implications of the COVID-19 pandemic in South Africa. Both studies concluded that the financial performance of companies was severely impacted, as revenue and returns experienced a sharp decline in this crisis period as a result of a national lockdown. This also resulted in an overall poor financial performance of companies. Benson and Fortune (2022) analysed the impact of COVID-19 on the sustainability operations and financial performance of South African listed companies. Similarly, Rogerson and Rogerson (2020) assessed the impact of COVID-19 on South Africa's tourism sector. Both studies found that COVID-19 severely impacted the performance of South African companies. It was noted that most companies' use of debt increased during COVID-19, except for companies that were highly liquid. In addition, companies scaled down their operations which, in return, had an adverse impact on financial performance. Benson and Fortune (2022) also concluded that sustainability operations and company performance are interrelated – when a company's sustainability activities increase, it is most likely for its financial performance to improve as well. Luke (2020) stated that South Africa's gross domestic product (GDP) decreased with 16% when COVID-19 was declared a pandemic. Furthermore, consumer spending declined with 49.8% - this clearly shows that the COVID-19 crisis had a devastating impact on South African companies' financial performance (Luke, 2020).

Companies associated with high levels of sustainability were more resilient to the impact of COVID-19 (Mattera *et al.,* 2021). Mattera *et al.* (2021) used CSR-strategies to measure European firms' recovery in terms of performance on the stock market. The results indicated that firms with long-term CSR-strategies could easier overcome a crisis, i.e., COVID-19. The same results were obtained from Hwang *et al.* (2020) who investigated whether ESG impacts the financial performance of South Korean firms and whether ESG can assist companies in surviving a crisis. By using ESG ratings, Hwang *et al.* (2021) confirmed that the performance of firms (specifically in terms of the ROA-ratio) that invested more in ESG activities did not decline as much as some other firms. Similar outcomes were obtained in a South African study by Mans-Kemp and Van Der Lugt (2020); however, this study did not consider the impact of sustainability operations in a crisis-time (COVID-19) as with the before mentioned studies.

From the above, it is evident that COVID-19 had an immense impact on South African companies. It was noted that sustainability operations provided resilience to foreign companies in a time of crisis; however, no such considerations were found with regard to South African listed companies – thus supporting the fact that this study made use of the relationship between financial and sustainability performance of South African JSE listed companies before and after COVID-19 to simulate a scenario in which multiple theoretical frameworks were interpreted.

5 RELATIONSHIP BETWEEN FINANCIAL AND SUSTAINABIITY PERFORMANCE

According to Halid *et al.* (2023), there are disagreements regarding the relationship between the financial and sustainability performance of firms, as some studies concluded that there is a positive correlation while others indicated a negative correlation or no correlation at all. Mans-Kemp and Van Der Lugt (2020) concluded that ESG activities increase South African firm's financial performance. Their study measured the quality of companies' integrated reports from 2013 to 2018 by using EY Excellence in Integrated Reporting Awards and the financial and sustainability performance in terms of Bloomberg's measures, and subsequently performed a mixed-model analysis of variance and panel regressions. However, in contrast to Mans-Kemp and Van Der Lugt (2020), Kalia and Aggarwal (2023) concluded that in developing economies, like South Africa, the sustainability operations (ESG scores) of firms have a minimal impact on firms' financial performance. Kalia and Aggarwal (2023) reached their conclusion by conducting a correlation and multivariate regression analysis to determine the impact that 468 companies' ESG score (as obtained from Thomson Reuters) in total, and separately (E-score, S-score and G-score), had on their financial performance in 2020.

This controversy is also evident in foreign companies: Velte (2017) performed a correlation and regression analysis to determine the relationship between German companies' ESG activities and ROA and Tobin's Q. It was concluded that there is a positive correlation between a company's ROA and its ESG activities; however, there is no correlation between Tobin's Q and ESG activities. German companies' performance was also mainly impacted by their governance activities and not environmental or social activities. Hussain *et al.* (2018) considered 31 foreign studies that investigated the relationship between financial and sustainability performance: 11 of these studies concluded that there is a negative correlation between financial performance and ESG, 14 studies reported a positive correlation, four studies indicated an insignificant correlation and the other two studies reported a U-shape and inverted shape correlation respectively.

The above studies considered the relationship between financial and sustainability performance during a non-crisis time; however, there is limited research conducted with regard to the impact that ESG has on companies' financial performance before and after a crisis-time (Pacelli *et al.*, 2020; Broadstock *et al.*, 2021). According to Assous (2022), companies with high ESG scores were more resilient to the impact of COVID-19 than companies that did not invest in sustainability operations. Further consideration is needed to confirm whether sustainability performance does, in fact, impact financial performance during a crisis-time (Broadstock *et al.*, 2021). This supports the fact that this study made use of the relationship between financial and sustainability performance of South African JSE listed companies before and after the COVID-19 crisis as a scenario in which multiple theoretical frameworks were interpreted.

6 SUMMARY

The aim of this chapter was to address the last three theoretical objectives as set out in Chapter 1 (see *section 5.2.1*), which is to examine how financial performance is evaluated, how sustainability performance is measured and how COVID-19 impacted the financial performance of JSE listed companies.

Chapter 3 investigated the importance of measuring companies' financial performance: firstly, stakeholders' decisions are based on a company's financial performance and secondly, managers use the evaluation of a company's performance to make business decisions. Financial ratio analyses can be used to measure the financial performance of companies – this also enables the comparison of a company's performance to other companies and the industry. ROE, an accounting-based measure of financial performance, is considered to be the main accounting ratio to use in measuring financial performance since it incorporates multiple aspects of a company's operations, as evident from the Du Pont model. Tobin's Q, a market-based measure of financial performance, measures performance from an investment perspective, i.e., how the market views a company.

It is important for companies to invest in sustainability operations, as stakeholders are concerned whether companies contribute to sustainability or not. ESG scores measure a company's environmental, social and governance performance and are externally and independently compiled, which makes it a reliable manner of measuring sustainability performance.

COVID-19 is seen as a crisis that severely impacted companies worldwide, including South Africa. This crisis affected the financial and/or sustainability performance of companies. Sustainability operations, i.e., ESG activities, are considered to be a resilience-tool for companies during a crisis-time, like COVID-19.

This chapter also explored the relationship between companies' financial and sustainability performance, which concluded to have contradictory results. Furthermore, it was noted that it is necessary to consider this relationship before a crisis as well as after a crisis period, especially within the South African context. Therefore, supporting the fact that this study used the relationship between South African JSE listed companies' financial performance (in terms of ROE) and sustainability performance (in terms of ESG scores) before and after the COVID-19 crisis to simulate a scenario in which multiple theoretical frameworks were interpreted.

Chapter 3 was the last literature chapter. The next chapter describes the research process followed.

CHAPTER 4: RESEARCH DESIGN AND METHODOLOGY

1 INTRODUCTION

The previous two chapters provided a literature review about the use and interpretation of theoretical frameworks in research studies (Chapter 2), financial performance, sustainability performance, the relationship between financial and sustainability performance and the impact of COVID-19 on companies' performance (Chapter 3). This chapter is aimed at identifying the research design and methodology adopted in the present study. Firstly, the purpose and characteristics of research are discussed. This is then followed by the research process which is described by making use of the research onion. At the end of Chapter 4 the framework, used to interpret this study's results, is presented.

2 PURPOSE AND CHARACTERISTICS OF RESEARCH

According to Saunders *et al.* (2019), research is defined as a process where data is collected and interpreted in order to reach a conclusion. The purpose of conducting research is thus to observe and explore facts and circumstances in an attempt to discover useful information to provide more clarity on phenomena (Saunders *et al.*, 2019). Coryn (2006) noted that there are three equally important characteristics of research:

- Research seeks the truth, i.e., the validity of information.
- Research provides an explanation of phenomena.
- Research is guided by those with the required competence.

Similarly, Saunders *et al.* (2019) provided the following three characteristics of research:

- Research discovers new information.
- Research data is systematically gathered.
- Research data is systematically explained.

From the above it is evident that, in order for research to be efficient, it must be conducted in an orderly and systematic manner (Saunders *et al.*, 2019). The research process can be guided by, inter alia, the research onion methodology. A detailed description of this methodology, as applicable to this study, follows below.

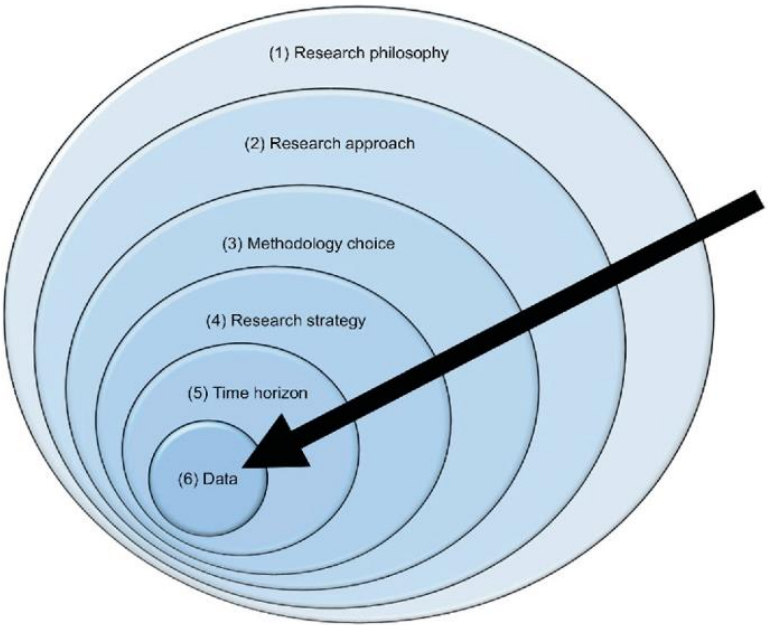
3 RESEARCH PROCESS

Methodology refers to the way in which research is conducted, i.e., the process to be followed by a researcher (Melnikovas, 2018). The research onion is a familiar methodological approach to research design (Oberholzer & Buys, 2023). The research onion was developed by Saunders *et al.* (2019) and consists of six layers which detail the research process (Saunders *et al.*, 2019). According to Saunders *et al.* (2019), these six layers of the research onion illustrate the research process in six elements, namely:

1) Research philosophy
2) Research approach
3) Methodology choice
4) Research strategy
5) Time horizon
6) Data

Oberholzer and Buys (2023) provided the following simplified illustration of the research onion, which must be considered from the outer layer inwards:

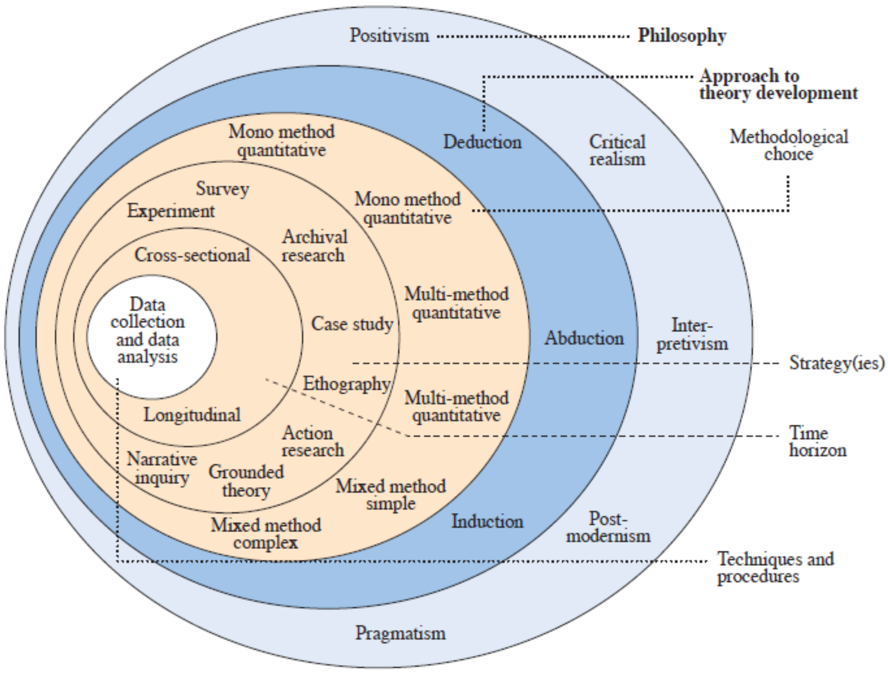
Figure 5: Simplified research onion



(Source: Oberholzer & Buys, 2023)

Alternatively, Saunders *et al.* (2019) provided the following, more detailed illustration of the research onion:

Figure 6: Detailed research onion



(Source: Saunders *et al.*, 2019)

Each layer of the research onion, as in Figure 6, is discussed in more detail below.

3.1 Research philosophy

The outer (first) layer of the research onion is the research philosophy, which refers to the development of new knowledge and is influenced by a researcher's beliefs and assumptions (Saunders *et al.*, 2019). According to Iivari (2007), the research philosophy depends on the researcher's assumptions, such as ontology and epistemology. These assumptions can further be broken down into, inter alia, positivism and interpretivism (Saunders *et al.*, 2019). A detailed discussion of these terms and the application thereof in the present study follow below.

3.1.1 Ontological assumptions

Ontological assumptions pertain to what the reality is (Hathcoat, 2019). Hacking (2002) described ontology as "what there is", while Smith (2012) said that ontology provides an identification of different objects that illustrate the reality. Similarly, Saunders *et al.* (2019) stated that ontological assumptions influence a researcher's view of different objects and determines what a researcher bases his research study on. The primary objective of the present study is to consider the interpretation of multiple theoretical frameworks on the same set of circumstances. This "set of circumstances" refers to the relationship between the financial and sustainability performance of

South African JSE listed companies that were most probably more severely impacted by COVID-19. Subsequently, the reality to be investigated by the researcher, i.e., the ontological object, is South African JSE listed companies that were most probably severely impacted by COVID-19.

Ontological assumptions further comprise subjectivism/constructivism and objectivism (Bahari, 2010). According to Bahari (2010), subjectivism/constructivism is when it is believed that the reality is influenced by social actors, whereas objectivism means that the reality exists independent from social actors. Morgan and Smircich (cited by Bahari, 2010) indicated that subjectivism pertains to a reality that is formed by a researcher's imagination and that objectivism pertains to an existing, solid reality that is not to be influenced by the researcher. Similarly, Saunders *et al.* (2019) stated that subjectivism is based on the assumption that reality is created through the actions of individuals, whereas objectivism is based on the assumption that reality "is what it is" and cannot be influenced by the actions of others.

The first part of the present study is based on objectivism, since the researcher uses existing data to analyse South African JSE listed companies' financial performance (ROE/Tobin's Q) and sustainability performance (ESG scores) prior to and after COVID-19. In order to reach the primary objective of this study, the second part of the study is based on subjectivism, where the results are interpreted by the researcher within the context of a specified theory.

3.1.2 Epistemological assumptions

Epistemological assumptions pertain to one's understanding of knowledge (Hathcoat, 2019). Bahari (2010) indicated that epistemological assumptions refer to the perceptions of knowledge and how it is obtained and interpreted. Similarly, Saunders *et al.* (2019) stated that epistemology is concerned with what constitutes acceptable, justifiable and rational knowledge. With reference to the present study, epistemological assumptions were made on the relationship between companies' financial and sustainability performance before and after COVID-19 and, in line with the study's primary objective, these findings were then interpreted from the perspectives of multiple theoretical frameworks.

Epistemological assumptions can be categorized as interpretivism or positivism (Bahari, 2010). Interpretivism relates to the fact that a researcher has a subjective view of reality and that knowledge obtained will be differently interpreted by different researchers (Alharahsheh & Pius, 2020). Saunders *et al.* (cited by Alharahsheh & Pius, 2020) described positivism as an observable reality where there is clear data and facts that are not influenced by any interpretations. Similarly, Saunders *et al.* (2019) stated that interpretivism refers to a researcher considering reality from the perspective of different individuals and groups, and consequently different researchers will interpret the same reality completely different. Furthermore, Saunders *et al.* (2019) also stated that positivism refers to “what is given”, i.e., pure and absolute information which cannot be altered by researchers.

After considering the aforementioned, it can be concluded that the first part of the study is based on positivism – this is applicable since South African JSE listed companies’ financial performance (ROE/Tobin’s Q) and sustainability performance (ESG scores) are analysed by using specific, unalterable data. This data is then used to establish the relationship between the financial and sustainability performance of companies, before and after a crisis-time, with no judgement involved. The second part of the study is based on interpretivism where the results are interpreted from the perspective of multiple theoretical frameworks, i.e., subjective in nature.

3.2 Research approach

The second layer of the research onion, i.e., the second step in the research process, is determining the research approach. According to Saunders *et al.* (2019), the research approach is concerned with a researcher’s use of theory (confirming or building a theory). Furthermore, a researcher can follow one of three approaches in his research study, namely, a deductive approach, an inductive approach or an abductive approach. A short description of these approaches follows below:

- Deductive approach: This approach is concerned with confirming an existing theory (Melnikovas, 2018). Furthermore, the deductive approach entails that the researcher is focused on providing explanations for relationships and correlations between different variables (Saunders *et al.*, 2019). With a deductive approach, a researcher starts at a specific theory and moves towards observations/evidence, i.e., the applicable data for the study (Saunders *et al.*, 2019):

  Theory → Data

- Inductive approach: This approach is the exact opposite of the deductive approach as it is not based on confirming an existing theory, but rather on building a new theory (Melnikovas, 2018). Saunders *et al.* (2019) stated that an inductive approach is when a researcher’s first priority is to make observations and to understand why things are the way they are – from there on, a theory is developed based on the researcher’s experience. A researcher thus starts at observations/evidence, i.e., the applicable data for the study and moves towards a theory (Saunders *et al.*, 2019):

  Data → Theory

- Abductive approach: This approach is a combination of a deductive and an inductive approach and is sometimes referred to as "retroduction" (Saunders *et al.*, 2019). The abductive approach entails that the researcher first makes observations or obtain evidence, then develops a theory and then uses this theory again in validating what was previously observed; therefore, the researcher moves between observations/evidence and the applicable theory (Saunders *et al.*, 2019):

Data → Theory → Data

The first part of the present study uses a deductive approach, since the relationship between companies' financial and sustainability performance before and after COVID-19 is investigated, i.e., the search for explanations for the correlation between theses variables. The second part of the study uses an inductive approach, since the interpretation of the relationship between financial and sustainability performance within the context of multiple theoretical frameworks is subjective and relies on the observations made by the researcher.

3.3 Methodological choice

The third layer of the research onion is the methodological choice. According to Saunders *et al.* (2019), the methodological choice refers to the method adopted by a researcher, i.e., a mono-method, a multi-method or a mixed method. Furthermore, Saunders *et al.* (2019) stated that the aforementioned is determined by whether a researcher makes use of a qualitative research design, a quantitative research design or a combination of the two. A mono-method is followed when only one set of qualitative/quantitative data is used, a multi-method is followed when more than one set of qualitative/quantitative data is used and a mixed method is followed when a combination of qualitative and quantitative data is used (Saunders *et al.,* 2019). Quantitative research will be applied when a researcher intends to evaluate the validity of an existing theory (Winter, 2000), whereas qualitative research aims to provide a researcher with an understanding of certain circumstances (Queirós *et al.,* 2017). A more detailed description of qualitative and quantitative research, as well as the application thereof in the present study, follows below.

3.3.1 Qualitative research

According to Melnikovas (2018) and Queirós *et al.* (2017), qualitative research involves a researcher investigating phenomena to obtain an understanding of the reasoning behind it - without the use of numerical data. Basias and Pollalis (2018) stated that qualitative research pertains to a researcher conducting, inter alia, interviews or distributing questionnaires to gather research data and that there is limited use of statistics and mathematical equations involved in the processing of the research data. Furthermore, Saunders *et al.* (2017) noted that, when qualitative research is conducted, it is important that researchers have physical access to their research domain – this is because researchers must observe the environment that they are studying in order to provide explanations for the occurrence of the phenomenon being researched. Basias and Pollalis (2018), together with Saunders *et al.* (2019), identified the following characteristics of qualitative research:

- The researcher is not separated from the research data, as the interpretation of findings is subjective and can be influenced by personal feelings and preferences.
- Qualitative research investigates the occurrence of phenomena in its natural domain.
- Qualitative research relies on a researcher's observations.
- Data is processed and results (usually in the form of words or pictures) are obtained in an unstructured way through a researcher's own conceptualisation.
- Qualitative research enables a researcher to discover more possible areas to be researched.

Saunders *et al.* (2019) noted that researchers make use of qualitative research when their aim is to build a new theory, that is, when an inductive approach is followed. Saunders *et al.* (2019) also stated that, since qualitative research provides results in the form of words and images, the interpretation of the results, i.e., the theory being built, is subjective as researchers will transcribe the words/images differently.

3.3.2 Quantitative research

In contrast to qualitative research, Melnikovas (2018) stated that quantitative research involves the use of numerical data. Saunders *et al.* (2019) substantiated this by stating that, through the application of statistics and mathematical equations, a quantitative research design is aimed at determining the relationship/correlation between different variables. In addition, Saunders *et al.* (2019) noted that control variables must also be incorporated in order to ensure the accuracy of quantitative research. Basias and Pollalis (2018), together with Saunders *et al.* (2019), identified the following characteristics of quantitative research:

- The researcher is separated from the research data, i.e., the researcher is objective, and cannot influence the outcome.
- Quantitative research investigates the correlation between variables.
- Quantitative research is used when large volumes of data must be processed.
- Data is processed and results (usually in the form of diagrams or statistical graphs) are obtained in a structured way through the use of statistical software.
- Quantitative research enables a researcher to compare different sets of data.

Furthermore, Basias and Pollalis (2018) noted that researchers often make use of quantitative research when they aim to confirm an existing theory, i.e., when a deductive approach is followed. Basias and Pollalis (2018) also stated that quantitative research is applicable when a researcher uses statistical information to investigate the reasoning behind certain phenomena.

From the aforementioned, it is thus evident that the most appropriate methodological choice for the first part of the present study is the use of quantitative research: firstly, because of this study's use of numerical data in examining the relationship between companies' financial performance (ROE/Tobin's Q) and sustainability performance (ESG scores); secondly, because this study follows a deductive approach (as discussed in *section 3.2*), and lastly because this study is aimed at investigating the reason behind phenomena, i.e., the relationship between companies' financial and sustainability performance before and after COVID-19. The second part of this study makes use of qualitative research, because the results are interpreted from the perspective of multiple theoretical frameworks, thereby following an inductive approach (as discussed in *section 3.2*). Furthermore, this study follows a mixed method, as quantitative data and qualitative data are used, i.e., the relationship/correlation between financial performance (ROE/Tobin's Q) and sustainability performance (ESG scores) - which is then interpreted within the context of multiple theoretical frameworks.

3.4 Research strategy

The fourth layer of the research onion is the research strategy. The research strategy defines how a researcher plans on conducting his research in order to solve the research problem and answering the research question(s) (Saunders *et al.*, 2019). The research strategy is influenced by the type of research to be conducted (qualitative or quantitative) and the type of data to be used in solving the research problem and meeting the research objective(s) (Oberholzer & Buys, 2023). Saunders *et al.* (2019) identified several research strategies that a researcher can use in conducting his research, namely:

1) Experiment
2) Survey
3) Archival (Documentary) Research
4) Case Study
5) Ethnography
6) Action Research
7) Grounded Theory
8) Narrative Inquiry

According to Saunders *et al.* (2019), the first two strategies (Experiment and Survey) pertain solely to quantitative research, whereas the next two strategies (Archival Research and Case Study) pertain to quantitative, qualitative or a combination of quantitative and qualitative research. The last four strategies (Ethnography, Action Research, Grounded Theory and Narrative Inquiry) pertain solely to qualitative research.

As the first part of this study uses quantitative research (as discussed in *section 3.3.2*), the research strategies to be considered for this study were the first two strategies mentioned, i.e., Experiment and Survey. Even though the Archival Research and the Case Study research strategies pertain to quantitative and qualitative research (as the case is with this study, see *section 3.3.2*), these strategies were not applicable, because data archives (such as government and press releases) were not consulted and a specific case study (such as a certain company or organisation) was not considered (Saunders *et al.*, 2019).

A brief description of the two possible research strategies that could have been adopted, i.e., Experiment or Survey, follows below.

3.4.1 Experiment

The Experiment research strategy involves the use of different variables to establish whether there is a relationship/correlation between these variables (Saunders *et al.*, 2019). When making use of this research strategy, it is important to differentiate between the dependent and independent variable – which can be defined as follows (Saunders *et al.*, 2019):

- → Dependent variable: The variable/element that responds to the change in the independent variable.
- → Independent variable: The variable/element that is being altered in order to identify its impact on a dependent variable.

According to Bolinger *et al.* (2022), the Experiment research strategy is applicable when one wants to investigate the impact that a company's characteristics have on other areas of their business. Furthermore, Bolinger *et al.* (2022) stated that this strategy eases the incorporation of larger volumes of data, i.e., it can accommodate a large quantity of companies.

From the aforementioned, it can be concluded that this study makes use of the Experiment research strategy, since the relationship/correlation between various companies' financial performance (ROE/Tobin's Q) and sustainability performance (ESG scores) before and after COVID-19 is investigated. There are three possible scenarios:

1. Positive relationship between ESG and ROE/Tobin's Q

2. Negative relationship between ESG and ROE/Tobin's Q
3. No relationship between ESG and ROE/Tobin's Q

As noted by Saunders *et al.* (2019), it is important to take note of the direction of the relationship, i.e., which variable (ESG or ROE/Tobin's Q) is the dependent variable (y) and which is the independent variable (x).

3.4.2 Survey

The Survey research strategy involves the use of questionnaires or structured interviews to gather data that can be quantitatively analysed, i.e., the answers from the questionnaires or structured interviews can be imported into statistical software which then provide the researcher with results in the form of, inter alia, diagrams or statistical graphs (Saunders *et al.*, 2019). The Survey strategy is a time-consuming strategy since the researcher is dependent on participants for the collection of data (Saunders *et al.*, 2019).

From the aforementioned, it is evident that the Survey strategy is not applicable to the present study as no questionnaires are distributed, nor are any structured interviews conducted. Furthermore, this study is not dependent on contributions from participants since publicly available data, such as companies' ROE/Tobin's Q and ESG scores, is used.

3.5 Time horizon

The fifth layer of the research onion is the time horizon, which stipulates the period that one's research will cover (Melnikovas, 2018). Saunders *et al.* (2019) stated that the time horizon can either be a "snapshot" taken at a specific time or a "series of snapshots" that represents circumstances over a period; therefore, the time horizon can be classified as either cross-sectional, longitudinal or a combination (panel data).

3.5.1 Cross-sectional

A study will use a cross-sectional time horizon if the study's objective is to provide clarity on the occurrence of a specific phenomenon at a specific time, i.e., when a "snapshot" is taken (Alturki, 2021).

The present study makes use of panel data (multiple companies are included over a time period) and companies' financial and sustainability performance are evaluated per year; therefore, a "snapshot" of each year's performance is taken. Subsequently, this study makes use of a cross-sectional time horizon; however, when considering the "bigger" picture, a longitudinal time horizon is also applicable (see below).

3.5.2 Longitudinal

A study will use a longitudinal time horizon if the study is aimed at providing clarity on the changes of phenomena over a certain time period, i.e., "series of snapshots" (Alturki, 2021). According to Saunders *et al.* (2019), the longitudinal time horizon is used when a researcher wants to examine change; therefore, the longitudinal time horizon is often associated with the use of variables to identify the impact that a change in one variable has on the occurrence of phenomena.

From the above, it can be concluded that this study makes use of a longitudinal time horizon, because different variables (see *section 3.4.1*) are used to determine the impact that sustainability performance (ESG scores) has on financial performance (ROE/Tobin's Q) or vice versa – i.e., the relationship between these variables. Furthermore, this study examines this relationship over a time period – before and after a crisis (COVID-19), which substantiates the use of a longitudinal time horizon.

3.6 Data

The centre of the research onion is the data which provides a description of the data to be used, how the data will be collected and how it will be analysed (Oberholzer & Buys, 2023). A more detailed discussion follows below.

3.6.1 Nature of data

This study made use of secondary data (data that was already previously collected) (Saunders *et al.*, 2019) – in this case, the financial ratios (ROE/Tobin's Q) and ESG scores of selected companies. According to Yaffee (2003), panel data constitutes data over a time period (longitudinal) where different observations can be made for these different periods (cross-sectional). As this study studies the relationship between financial and sustainability performance per year, as well as before and after COVID-19, i.e., a cross-section and longitudinal time horizon (see *section 3.5*), it can be concluded that the study makes use of panel data.

3.6.2 Population and sampling

Population refers to the broader spectrum, i.e., all the possible elements that a study aims to investigate (Saunders *et al.*, 2019). For the present study, the population consisted of JSE listed companies that trade in the industries that were more severely impacted by the COVID-19 pandemic. This included the following industries: Basic Materials, Industrials, Consumer Goods, Consumer Services and Telecommunication – the 193 companies within these industries thus constituted the population (Listcorp, 2023).

Sampling refers to the process of selecting certain objects from a population that is representative of the population as a whole (Majid, 2018). Studies where statistical analyses are conducted require a large sample size in order to provide for a margin of error (Saunders *et al.*, 2019). As data was statistically analysed in this study (relationship between financial and sustainability performance), a large sample was selected – i.e., a scientific sample size that was sufficient to perform the required analyses. Subsequently, the sample included all the companies that met the criteria for inclusion (see *section 3.6.3.1*) – this resulted in a sample size of 104 companies. Furthermore, this was a convenience sample – a sample chosen based on the data that is available and easy to be obtained (Saunders *et al*., 2019). Only companies for which the required financial data (e.g., ROE/Tobin's Q) and sustainability data (ESG scores) was available, were included in the sample.

3.6.3 Data collection

For the present study, financial and sustainability data was required. Financial data, such as companies' ROE and Tobin's Q, was extracted from IRESS. In the limited cases where some financial data was missing, the average of the available data points was used. Sustainability data, i.e., ESG scores, in total and per pillar, was bought from InvestVerte, an ESG rating provider. InvestVerte uses an impact-based approach in determining ESG scores, i.e., ESG drivers are chosen based on their impact on a company's financial ratios (quantitative model) and/or other ESG elements (qualitative model), and two scores are generated: a quantitative score and a qualitative score. These two scores are then combined by conducting a multiple ordinal logistic regression to provide an overall ESG score. The scores range from 0 to 100, where 0 is the worst score and 100 is the best score to be obtained.

Companies were selected based on the criteria below:

3.6.3.1 Criteria

For a company to be included in this study, the following criteria had to be met:

- The company must be a South African JSE listed company.
- The company must trade in one of the industries that were severely affected by COVID-19.
- The company must have financial data available from 2017 to 2019 and from 2021 to 2022 – specifically the data to calculate ROE and Tobin's Q (however, if one year's data is missing, the company can still be included as a linear mixed effect model is used - see *section 3.6.4.7*).
- The company must have ESG data available from 2017 to 2019 and from 2021 to 2022.

- The company’s financial data must not include outliers, i.e., extreme values that differ from other data points.

Of the 193 companies trading in the industries that were severely impacted by COVID-19, 104 companies met the above criteria – i.e., a convenience sample of 104 companies was selected.

3.6.3.2 Time frame

The data for this study was divided into two parts: a period before COVID-19 and a period after COVID-19. Limited studies conducted a before and after analysis of the impact of COVID-19; however, after consideration of two particular studies performed by Radivojević *et al.* (2023) and Travergård and Pettersson (2023), the following was gathered with regard to the COVID-19 period:

The WHO declared the COVID-19 pandemic as a global pandemic in March 2020 (Ciotti *et al.,* 2020). Furthermore, 2020 is considered to be the year in which COVID-19 had the most devastating impact on companies, i.e., the peak of the COVID-19 pandemic (Radivojević *et al*., 2023). According to the studies performed by Radivojević *et al.* (2023) and Travergård and Pettersson (2023), the period before 2020 is considered to be pre-COVID, while periods after 2020 are seen as recovery periods from COVID-19 (shortly referred to as after/post-COVID-19).

Since companies’ financial and sustainability data for 2023 were not finalised yet, 2023 was not included in this study. Consequently, the post-COVID period was defined as 2021-2022. To be in alignment with the post-COVID period, the pre-COVID period also constituted two years, i.e., 2018-2019, while 2017 was used as the base year when regressions were performed. As 2020 was the peak of the COVID-19 pandemic, this year was excluded since it was not representative of a period before or after, i.e., recovering from COVID-19.

- *Before COVID-19: 2018-2019*
- *After COVID-19: 2021-2022*

3.6.4 Data description

After financial data was extracted from IRESS and sustainability data had been bought from InvestVerte, the data was analysed and can be described as follows:

3.6.4.1 Distribution of data

This study included 104 companies that traded in the industries that were probably most severely affected by COVID-19. Table 2 below provides a summary of the companies (per industry) included:

Table 2: Companies per industry

Industry	Number of companies included
Basic Materials	18
Communication Services	11
Consumer Cyclical	27
Consumer Defensive	16
Industrials	32
Total companies:	*104*

(Source: Researcher's own contribution, 2023)

A detailed description of all the companies included (in alphabetical order) and the industry in which they trade are presented in Appendix A.

3.6.4.2 Variables of the study

This study consists of three variables, i.e., dependent, independent and control variables. As noted in *section 3.4.1*, it is important to take note of the direction of the relationship, i.e., which variable (ROE/Tobin's Q or ESG) is the dependent variable (y) and which is the independent variable (x) (Saunders *et al.*, 2019). The following base model was developed:

$$y = alfa + beta\ (x) + control\ independent\ variable$$

There are two possible scenarios:

(a) Financial performance = alfa + sustainability performance (beta)

(b) Sustainability performance = alfa + financial performance (beta)

A more detailed discussion follows below.

<u>Dependent variable</u>

As previously noted, the dependent variable is the variable/element that responds to the change in the independent variable (Saunders *et al.*, 2019).

The dependent variable in this study, similarly to the study performed by Jha and Rangarajan (2020) who investigated the direction of the relationship between financial and sustainability performance, is twofold. The dependent variable is firstly a company's ROE/Tobin's Q (financial performance), whereby the impact of ESG on financial performance is investigated. Thereafter, the dependent variable is a company's ESG score (sustainability performance), whereby the impact of financial performance on sustainability performance is investigated.

Independent variable

As previously noted, the independent variable is the variable/element that is being altered in order to identify its impact on a dependent variable (Saunders *et al.*, 2019).

As with the dependent variable, the independent variable in this study is also similar to the study performed by Jha and Rangarajan (2020), i.e., it is twofold. The independent variable is firstly a company's ESG score (sustainability performance), whereby the impact of ESG on financial performance is investigated. Thereafter, the independent variable is a company's ROE/Tobin's Q (financial performance), whereby the impact of financial performance on sustainability performance is investigated.

Control variables

A control variable is not a variable of interest, but, as it may affect a study's outcomes, it is kept constant throughout the study to avoid it influencing the impact that an independent variable has on a dependent variable (Saunders *et al.*, 2019).

Prior studies that also investigated the relationship between financial and sustainability performance made use of various control variables which include, amongst others, the following:

Hussain *et al.* (2018) determined the impact that ESG has on ROA, ROE and Tobin's Q and included the industry in which a firm operates, the firm's size (total assets), the capital, research and development intensity of the firm, the sales growth and the debt-to-equity ratio of the firm as control variables. Similarly, Saygili *et al.* (2021) included firm size, debt-to-equity ratio and current ratios as control variables when determining the effect of environmental disclosure on ROE and Tobin's Q. Hwang *et al.* (2021) examined the relationship between ROA and ESG before and after COVID-19 and included, amongst others, firm size, leverage, sales growth, cash holdings and the COVID-19 period as control variables.

After consideration of the aforementioned, the control variables for the scenarios stated above, (a) and (b), are as follows:

- → Firm size (Total assets of a company)
- → Leverage (Debt ratio)
- → Liquidity (Current ratio)
- → Industry/Sector (Basic Materials, Consumer Cyclical, Consumer Defensive, Communication, Industrials)
- → COVID-19/non-COVID-19 (Before or after COVID-19, i.e., 2018-2019 or 2021-2022)

3.6.4.3 Descriptive statistics

For each company that met the criteria in *section 3.6.3.1*, the following data was gathered:

Financial performance indicator

→ ROE
→ Tobin's Q

Sustainability performance indicator:

→ Environmental score (E-score)
→ Social score (S-score)
→ Governance score (G-score)
→ ESG score

Control variables: (see *section 3.6.4.2*)

→ Total assets
→ Debt ratio
→ Current ratio
→ Sector
→ COVID-19/non-COVID-19 period

Saunders *et al.* (2019) stated that descriptive statistics provide a numerical description of a study's data. The present study's descriptive statistics are presented in Tables 3 to 5 below. At Table 3, each term included in Tables 3 to 5 is defined. The interpretation of the results (specifically the mean) relates to empirical objectives 1 and 2, and a discussion thereof is presented in Chapter 5 (see *section 2.1.1 and 2.1.2*).

Table 3: Descriptive statistics – Sustainability performance

	Sustainability performance			
	E-score	***S-score***	***G-score***	***ESG-score***
Mean[1]	43,745	70,104	64,941	59,825
Standard Deviation[2]	6,350	2,983	1,933	2,829
Median[3]	44,140	69,890	65,070	59,920
Sample Variance[4]	40,317	8,898	3,735	8,002
Kurtosis[5]	2,794	2,499	89,578	4,954
Skewness[6]	-1,081	0,664	-6,365	-1,147
Range[7]	41,020	24,150	35,230	25,770
Minimum[8]	19,270	62,800	36,700	41,400
Maximum[9]	60,290	86,950	71,930	67,170
Confidence Level (95,0%)[10]	0,553	0,260	0,168	0,247

(Source: InvestVerte data, analysed by researcher, 2023)

Definitions (Saunders *et al.*, 2019):

[1] *Mean*: The average of all data points, i.e., the sum of the numerical values of all the observations divided by the number of observations.

[2] *Standard deviation*: A numerical value that describes how the data is spread around the mean. A small standard deviation indicates that the mean is a reliable representative of the actual data.

[3] *Median*: The middle value of a set of data when all the data points are arranged from the smallest value to the largest value.

[4] *Sample Variance*: A measurement of the average distance of data points from the mean. Sample variance is the square of the standard deviation. A sample variance indicates that the data points are close to the mean.

[5] *Kurtosis*: The distribution of data in comparison with the normal distribution. A positive value indicates that the data is pointier than the normal distribution, whereas a negative value indicates that the data is flatter than the normal distribution.

[6] *Range*: The highest value for a variable less the slowest value for the same variable.

[7] *Skewness*: A measurement of the asymmetry of data, i.e., whether data is shifted to one sight. A positive value indicates that data is more shifted to the right side of the distribution, whereas a negative value indicates that data is more shifted to the left side of the distribution.

[8] *Minimum*: The smallest value in a set of data.

[9] *Maximum*: The largest value in a set of data.

[10] *Confidence level*: The probability that an estimate will fall within an identified range of values.

Table 4: Descriptive statistics – Financial performance

	Financial performance	
	ROE	***Tobin's Q***
Mean	10,412	1,217
Standard Deviation	23,775	0,966
Median	11,465	0,890
Sample Variance	565,237	0,934
Kurtosis	51,674	5,896
Skewness	-5,128	2,028
Range	357,800	7,370
Minimum	-280,530	0,050
Maximum	77,270	7,420
Confidence Level (95,0%)	2,072	0,084

(Source: IRESS data, analysed by researcher, 2023)

Table 5: Descriptive statistics – Control variables

	Control variables		
	Current ratio	***Debt ratio***	***Total assets (R'000 000)***
Mean	2,838	0,498	26521,076
Standard Deviation	13,751	0,257	57080,308
Median	1,595	0,490	8423,6
Sample Variance	189,079	0,066	3258160000000
Kurtosis	264,824	3,663	0,028,657
Skewness	16,077	0,997	0,005
Range	247,990	2,030	469927,078
Minimum	0,260	0,000	40,922
Maximum	248,250	2,030	469968
Confidence Level (95,0%)	1,199	0,022	4975,544

(Source: IRESS data, analysed by researcher, 2023)

3.6.4.4 Model specification

Following the base model in *section 3.6.4.2*, the following models were developed for (a) and (b) respectively:

Base model: $y = alfa + beta\ (x) + control\ variable$

(a) Financial performance = alfa + sustainability performance (beta)

$$ROE\ (Tobin's\ Q) = alfa + betaESG + control\ variables\ ^{\#}$$

$^{\#}firmSize, Leverage, Liquidity, Sector, Covid$

(b) Sustainability performance = alfa + financial performance (beta)

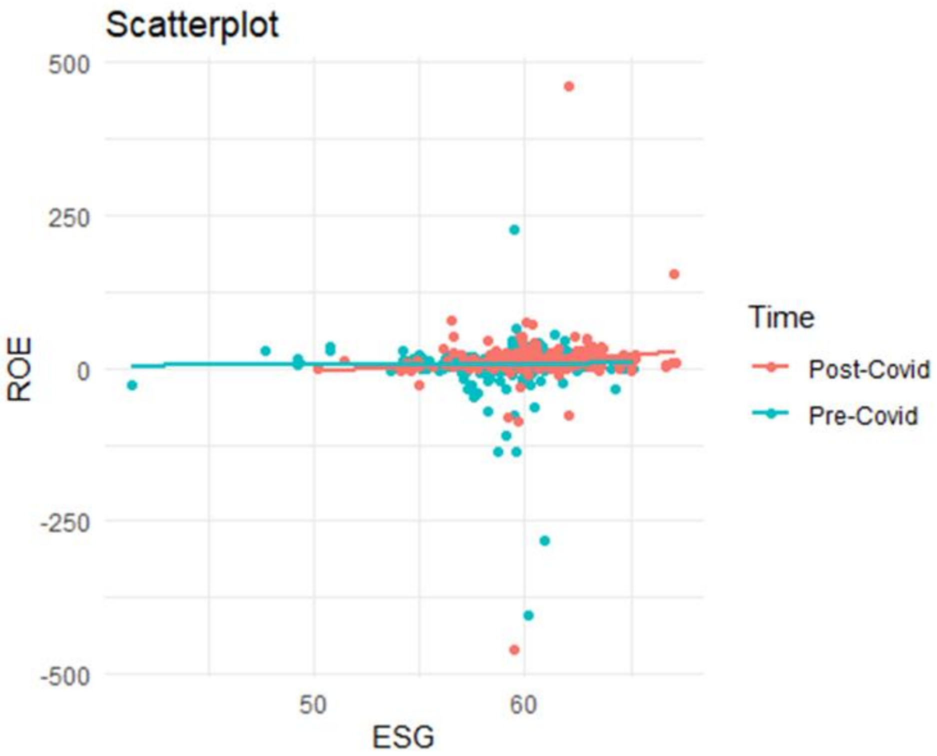
$$ESG = alfa + betaROE + betaTobin's\ Q + control\ variables\ ^{\#}$$

$^{\#}firmSize, Leverage, Liquidity, Sector, Covid$

3.6.4.5 Data analysis

A visual inspection of the data indicates that the data points are similarly spread before and after COVID-19. The scatterplots illustrating the spread of data between ROE/Tobin's Q and ESG scores before and after COVID-19 are presented below (the scatterplots per ESG pillar are presented in Appendix B).

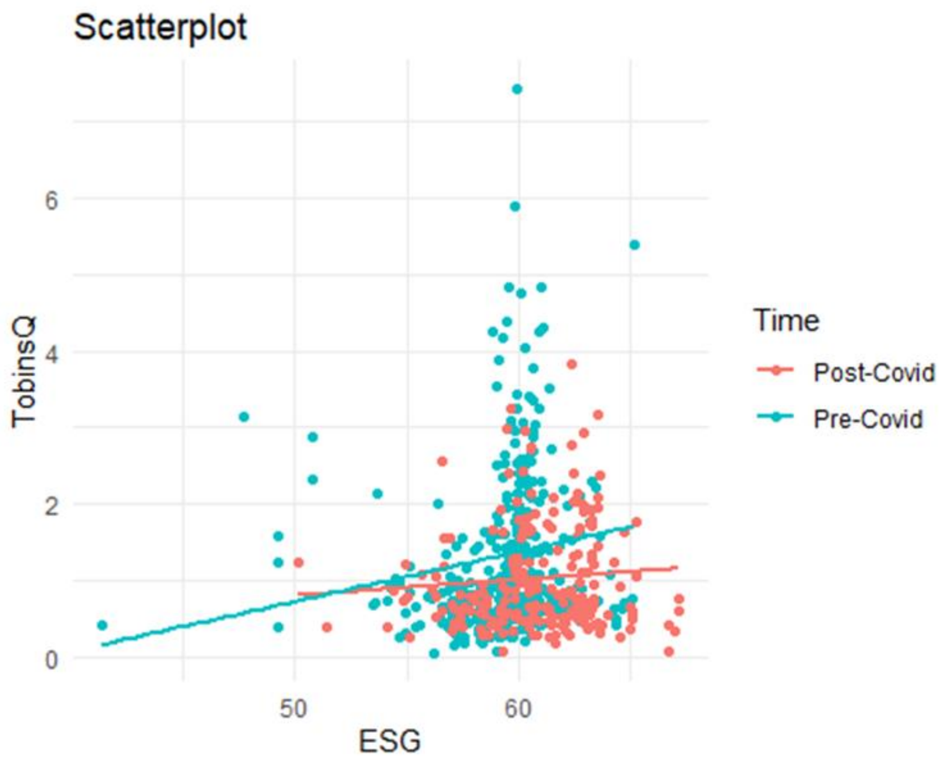
Figure 7: Spread of data (ROE and ESG) before and after COVID-19



(Source: Bakdash & Marusich, 2023)

Figure 7 illustrates that the data is similarly spread between ROE and ESG before and after COVID-19.

Figure 8: Spead of data (Tobin's Q and ESG) before and after COVID-19



(Source: Bakdash & Marusich, 2023)

Figure 8 illustrates that, as with ROE, there is a small difference between the spread of data between Tobin's Q and ESG before and after COVID-19.

3.6.4.6 Correlation analysis

By making use of Bakdash and Marusich's repeated measure correlation, correlation analyses were conducted to identify the co-relationship between the different variables and whether the correlations were statistically significant or not. By conducting correlation analyses, empirical objective 3 (to establish the relationship between financial and sustainability performance) was partly reached. Correlation analyses were done in total for all the companies in all the sectors identified, as well as for each sector individually. A probability (p-value) of more than 0.1 indicates no relationship, a p-value of less than 0.1 indicates a weak relationship between variables, where a p-value of less than 0.05 indicates a strong relationship and a p-value of less than 0.01 indicates a very strong relationship (Saunders *et al*., 2019). The coefficient (r) indicates the strength and direction of the relationship between variables (Saunders *et al.*, 2019).

$$p > 0.1 : No\ relationship$$

$$p \leq 0.1 : Weak\ relationship$$

$$p \leq 0.05 : Strong\ relationship$$

$$p \leq 0.01 : Significant\ relationship$$

Table 6 presents the results from the repeated measure correlations.

Table 6: Significance of correlations between variables

	Environmental	Social	Governance	ESG
All sectors				
ROE				
Coefficient (r)	0.076	0.009	0.104	0.098
p-value	0.0366**	0.801	0.004***	0.006***
Tobin's Q				
Coefficient (r)	-0.082	-0.113	-0.029	-0.103
p-value	0.024**	0.002***	0.431	0.005***
Basic materials				
ROE				
Coefficient (r)	0.258	-0.024	0.267	0.296
p-value	0.001***	0.766	<0.001***	<0.001***
Tobin's Q				
Coefficient (r)	0.026	-0.471	0.154	0.016
p-value	0.749	<0.000***	0.054*	0.842
Communication				
ROE				
Coefficient (r)	0.014	0.141	0.217	0.118
p-value	0.895	0.171	0.034**	0.253
Tobin's Q				
Coefficient (r)	-0.002	-0.080	-0.181	-0.072
p-value	0.986	0.438	0.077*	0.484
Consumer cyclical				
ROE				
Coefficient (r)	0.049	-0.011	0.017	0.042
p-value	0.452	0.861	0.793	0.517
Tobin's Q				
Coefficient (r)	-0.147	-0.110	-0.222	-0.218
p-value	0.023**	0.090*	<0.001***	<0.001***
Consumer defensive				
ROE				
Coefficient (r)	-0.018	-0.176	-0.143	-0.075
p-value	0.834	0.035**	0.088*	0.376
Tobin's Q				
Coefficient (r)	-0.111	0.022	-0.063	-0.089
p-value	0.186	0.793	0.452	0.291
Industrials				
ROE				
Coefficient (r)	0.014	0.032	0.029	0.023
p-value	0.874	0.719	0.744	0.798
Tobin's Q				
Coefficient (r)	-0.254	-0.042	-0.172	-0.256

p-value	0.004***	0.636	0.053*	0.004***

*Significance level at 0.1 (two-tailed)

**Significance level at 0.05 (two-tailed)

***Significance level at 0.01 (two-tailed)

(Source: Bakdash & Marusich, analysed by researcher, 2023)

After consideration of the above correlations, it is clear that “All sectors” provide the best correlations between variables: “All sectors” have six correlations at significant levels, whereas the individual sectors only have five, two, four, two and three correlations at significant levels respectively. Furthermore, “All sectors” have correlations at a significance level of 0.05 and 0.01 only, whereas the other sectors include correlations at significance levels of 0.1; therefore, the models built were based on “All sectors” and not a model for each sector individually. The bordered section of Table 6 was thus used to build the models.

3.6.4.7 Regression analysis

This study used panel data (see *section 3.6.1*) and made use of a linear mixed effect regression model to analyse the data. A linear mixed effect model is appropriate when data is unbalanced, i.e., when some years have data points missing and when the data is longitudinal (Peng & Lu, 2012). In this study, the data is unbalanced as each year’s data (selected companies) is not identical (see *section 3.6.3.1*) and the data is longitudinal (see *section 3.5.2*); therefore, a linear mixed effect model is suitable. A mixed effect model comprises random components and fixed components. The random component is the component/variable that has a varying impact on outcomes, whereas the fixed component is the component/variable that has a constant impact on outcomes (Peng & Lu, 2012). In this study, the random component is the companies included, because the inclusion of any other sample of companies will have a different impact on the outcome; all other variables are fixed components. There are certain assumptions associated with linear mixed effect models (similar as with ordinary least square models) (Peng & Lu, 2012). The assumptions tested in the present study were as follows:

- Multicollinearity: This occurs when at least two independent variables are highly related/correlated (Alin, 2010). Multicollinearity is measured by a Generalised Variance Inflator Factor (GVIF) – a high value (more than 10) indicates that there is a strong correlation between independent variables, which then requires one or more independent variables to be removed to eliminate the multicollinearity (Alin, 2010).
- Normality: This indicates whether the data is normally distributed or not, and can be illustrated by making use of a quantile-quantile (Q-Q) plot that shows the distribution of data (in quantiles) in comparison to theoretical quantiles. A linear pattern indicates that the data is normally distributed (Das & Imon, 2016).

- Homoscedasticity: This indicates the distribution of residuals, i.e., whether the data points for the dependent and independent variables have equal variances. If residuals are plotted on a scatterplot and are equally distributed (thus, not a coned-shape pattern), then the data is homoscedastic (Osborne & Waters, 2019; Saunders *et al.*, 2019).

3.6.4.8 Adjusted models

After it was noted that the data was similarly distributed before and after COVID-19 (see *section 3.6.4.5*), "$Covid$" was excluded as a control variable; however, regressions were still done for each year to enable the interpretation of results within the context of multiple theories.

As "All sectors" revealed to have the most significant relationship between variables (see *section 3.6.4.6*), "All sectors" were considered and therefore "$Sector$" was excluded as a control variable.

On advice from the North-West University (NWU) Statistical Consultation Services (and due to the data being shattered), the dependent variable, Tobin's Q, was substituted by the log transformation ($logTobin's\ Q$) to reduce the skewness of the data and to come closer to a normal distribution.

After consideration of the above, together with the correlation between the variables presented in Table 5, the models identified in *section 3.6.4.4* were adjusted as follows:

Note that the original model is presented first, after which the adjusted models (excluding $Sector$ and $Covid$) are presented. Where E, S or G were insignificantly correlated with ROE/Tobin's Q, the variable was excluded in the regression model.

(a) Financial performance = alfa + sustainability performance (beta)

Original:

$$ROE\ (Tobin's\ Q) = alfa + betaESG + control\ variables\ ^{\#}$$

$^{\#}firmSize, Leverage, Liquidity, Sector, Covid$

Adjusted:

In total:

Model 1: $$ROE = alfa + betaESG *** + control\ variables\ ^{\#}$$

$^{\#}\ firmSize, Leverage, Liquidity$

$***\ Table\ 6: Very\ strong\ relationship\ between\ ROE\ and\ ESG$

Per pillar:

Model 2: $ROE = alfa + betaE ** + betaG *** + control\ variables\ ^{\#}$

$^{\#}\ firmSize, Leverage, Liquidity$

$**\ Table\ 6: Strong\ relationship\ relationship\ between\ ROE\ and\ E$ (p = 0.0366)

$***\ Table\ 6: Very\ strong\ relationship\ between\ ROE\ and\ G$ (p = 0.004)

Note that S was excluded since the correlation with ROE was statistically insignificant (p = 0.801).

In total:

Model 3: $logTobin's\ Q = alfa + betaESG *** + control\ variables\ ^{\#}$

$^{\#}\ firmSize, Leverage, Liquidity$

$***\ Table\ 6: Very\ strong\ relationship\ between\ Tobin's\ Q\ and\ ESG$ (p = 0.005)

Per pillar:

Model 4: $logTobin's\ Q = alfa + betaE ** + betaS *** + control\ variables\ ^{\#}$

$^{\#}\ firmSize, Leverage, Liquidity$

$**\ Table\ 6: Strong\ relationship\ between\ Tobin's\ Q\ and\ E$ (p = 0.024)

$***\ Table\ 6: Very\ strong\ relationship\ between\ Tobin's\ Q\ and\ S$ (p = 0.002)

(b) Sustainability performance = alfa + financial performance (beta)

Original:

$$ESG = alfa + betaROE + betaTobin's\ Q + control\ variables\ ^{\#}$$

$^{\#}\ firmSize, Leverage, Liquidity, Sector, Covid$

Adjusted:

In total:

Model 5: $ESG = alfa + betaROE *** + betaTobin's\ Q *** + control\ variables\ ^{\#}$

$^{\#}\ firmSize, Leverage, Liquidity$

$*** \; Table\ 6: Very\ strong\ relationship\ between\ ESG\ and\ ROE$ (p = 0.006)

$*** \; Table\ 6: Very\ strong\ relationship\ between\ ESG\ and\ Tobin's\ Q$ (p = 0.005)

Per pillar:

Model 6: $E = alfa + betaROE ** + betaTobin's\ Q ** + control\ variables\ ^{\#}$

$^{\#}\ firmSize, Leverage, Liquidity$

$** \; Table\ 6: Strong\ relationship\ between\ E\ and\ ROE$ (p = 0.0366)

$** \; Table\ 6: Strong\ relationship\ between\ E\ and\ Tobin's\ Q$ (p = 0.024)

Model 7: $S = alfa + betaTobin's\ Q *** + control\ variables\ ^{\#}$

$^{\#}\ firmSize, Leverage, Liquidity$

$*** \; Table\ 6: Very\ strong\ relationship\ between\ S\ and\ Tobin's\ Q$ (p = 0.002)

Model 8: $G = alfa + betaROE *** + control\ variables\ ^{\#}$

$^{\#}\ firmSize, Leverage, Liquidity$

$*** \; Table\ 6: Very\ strong\ relationship\ between\ G\ and\ ROE$ (p = 0.004)

4 Framework

After consideration of all the elements that this study incorporates, a framework was developed to provide guidance in interpreting findings within the context of multiple theories. The results from the above models, being the direction of the relationship and whether it differs between the period before and after COVID-19, are interpreted within the six identified theories. The framework, which accommodates the direction of the relationship, whether (a) Financial performance = alfa + sustainability performance (beta) or (b) Sustainability performance = alfa + financial performance (beta), is presented in Table 7. Only stakeholder theory is used to demonstrate the interpretation of the direction of the relationship since the interpretation is similar to other theories.

Table 7: Framework for interpreting results within the context of multiple theoretical frameworks

Relationship between:	**Before COVID-19 (No crisis)**	**After COVID-19 (No crisis/Recovering from a crisis)**
ROE/Tobin's Q & ESG	**Stakeholder theory**	
→ *Positive*	(a) The financial performance of companies is positively impacted by its ESG activities. (b) Companies' sustainability performance is positively impacted by its financial performance.	(a) The financial performance of companies, after a crisis, is positively impacted by its ESG activities. (b) Companies' sustainability performance, after a crisis, is positively impacted by its financial performance.
→ *Negative*	(a) The financial performance of companies is negatively impacted by its ESG activities. (b) Companies' sustainability performance is adversely impacted by its financial performance.	(a) The financial performance of companies, after a crisis, is negatively impacted by its ESG activities. (b) Companies' sustainability performance, after a crisis, is adversely impacted by its financial performance.
→ *Neutral*	(a) The financial performance of companies has no effect on its ESG activities. (b) Companies' sustainability performance is not affected by its financial performance.	(a) The financial performance of companies, after a crisis, has no effect on its ESG activities. (b) Companies' sustainability performance, after a crisis, is not affected by its financial performance.
ROE/Tobin's Q & ESG	**Stewardship theory**	
→ *Positive*		
→ *Negative*		
→ *Neutral*		
ROE/Tobin's Q & ESG	**Signalling theory**	
→ *Positive*		
→ *Negative*		
→ *Neutral*		
ROE/Tobin's Q & ESG	**Shareholder theory**	
→ *Positive*		
→ *Negative*		
→ *Neutral*		
ROE/Tobin's Q & ESG	**Resource-based theory**	
→ *Positive*		
→ *Negative*		
→ *Neutral*		
ROE/Tobin's Q & ESG	**Legitimacy theory**	
→ *Positive*		
→ *Negative*		
→ *Neutral*		

(Source: Researcher's own contribution, 2023)

The first column presents the outcomes, i.e., whether the relationship between ROE/Tobin's Q and ESG is positive, negative or neutral. The second column presents the interpretation of the outcomes before COVID-19; if ROE/Tobin's Q was impacted by ESG, there is an interpretation at (a), and if ESG was impacted by ROE/Tobin's Q, there is an interpretation at (b). The last column is similar to the second column, the only exception being that it is for the period after COVID-19.

To illustrate the interpretation of Table 7, both (a) and (b) are considered at a positive, negative and neutral outcome. However, once the actual results have been obtained, the interpretation was either at "positive', "negative" or "neutral" and, depending on the direction, either at (a) or (b).

5 ETHICAL CONSIDERATIONS

The financial ratios of companies are publicly available as it can be extracted from IRESS. ESG scores can be bought from ESG providers; therefore, no consent is required before utilising this information. The results from this study are not specifically linked to a company, but rather to all the companies as a whole – there is thus anonymity. Ethical clearance was obtained from the NWU. The ethical certificate is included as Appendix E.

6 SUMMARY

The aim of Chapter 4 was to specify the present study's research design and methodology. Firstly, the purpose and characteristics of research were identified – research must be conducted in an orderly and systematic manner to enable the researcher to draw conclusions on the occurrence of phenomena. Thereafter, the research process was described by making use of the research onion: a methodological approach that describes the research process in six layers/elements.

Under the research philosophy, it was concluded that the first part of this study was based on objectivism and positivism, as existing data was used to analyse the relationship between financial performance (ROE/Tobin's Q) and sustainability performance (ESG scores) (thus, the researcher is separated from the research data). The second part of this study was based on subjectivism and interpretivism, as the results were interpreted within the context of multiple theoretical frameworks (thus, the researcher can influence the interpretation of the research data).

The first part of this study followed a deductive approach, since it was concerned with confirming an existing theory which entails obtaining explanations for the relationships and correlations between different variables, i.e., ROE/Tobin's Q and ESG scores. The second part of this study followed an inductive approach, since it was concerned with theory-building and interpreting the relationship between financial and sustainability performance.

The methodological choice for the first part of the present study was to make use of quantitative research, as numerical data was used to examine the relationship between companies' financial performance (ROE/Tobin's Q) and sustainability performance (ESG scores). The second part of the study made use of qualitative research, as the results obtained were interpreted by the researcher.

An Experiment research strategy was followed, as this study used variables (ROE/Tobin's Q, ESG scores) to determine the relationship between financial and sustainability performance. Furthermore, since this study incorporated a large number of companies, the Experiment research strategy was the most appropriate strategy to follow.

This study used a longitudinal and a cross-sectional time horizon (panel data), since phenomena (the relationship between financial and sustainability performance) was observed each year and over a period of time, i.e., before and after COVID-19.

Financial data was extracted from IRESS and sustainability data was bought from InvestVerte. A total of 104 companies met the criteria to be included in this study. These companies' data was divided into a period before COVID-19 (2018-2019) and a period after COVID-19 (2021-2022). Correlation analyses were conducted to establish the relationship between ROE/Tobin's Q and ESG scores and vice versa; subsequently, eight regression analyses models were developed. It was noted that the time period had an insignificant effect on this relationship; however, regressions were still performed for each year to enable the interpretation of results within the context of multiple theoretical frameworks. To analyse the data, a linear mixed effect model was used.

Chapter 4 concluded with a framework that was used as a guidance to interpret the findings of this study, i.e., the relationship between financial and sustainability performance before and after COVID-19, as well as the direction of this relationship within the context of multiple theoretical frameworks.

The next chapter, Chapter 5, presents the interpretation of companies' financial and sustainability performance as well as the results from the regression analyses conducted.

CHAPTER 5: RESULTS AND FINDINGS

1 INTRODUCTION

Chapter 4 presented the research design and methodology adopted in the present study. Chapter 5 presents the results obtained to meet empirical research objectives 1 to 4 (see *Chapter 1, section 5.2.2*).

2 RESEARCH OBJECTIVES

The primary objective of this study was to interpret the relationship between JSE listed companies' financial and sustainability performance before and after a crisis-time (COVID-19) within the context of multiple theoretical frameworks. To reach this objective, theoretical and empirical secondary objectives were identified in *section 5.2.1* and *5.2.2* of Chapter 1. The theoretical objectives are discussed in Chapter 6. Empirical objectives 1 to 4 relate to the establishment of the relationship between financial and sustainability performance, which required multiple analyses to be conducted, as well as the interpretation of the results within the context of multiple theories. These objectives, together with the results from the analyses and their interpretation, are discussed below.

2.1 Empirical objectives

The study comprises four empirical objectives. To reach empirical objectives 1 to 4, companies' financial and sustainability data was obtained, and the models discussed in Chapter 4 were applied. Brief discussions, linking each empirical objective to its finding, are presented below.

2.1.1 Empirical objective 1

Empirical objective 1 was stated as follows:

To analyse the financial performance (in terms of ROE/Tobin's Q) of South African JSE listed companies (in the Basic Materials, Industrials, Consumer Goods, Consumer Services and Communication industries) by calculating and analysing appropriate ratios prior to and after the COVID-19 pandemic.

ROE, an accounting-based measure of financial performance, and Tobin's Q, a market-based measure of financial performance, were used to evaluate the financial performance of 104 JSE listed companies in the above-mentioned industries. These ratios were extracted from IRESS. Table 8 presents the mean (average) and standard deviation (also see the descriptive statistics in *Chapter 4*, *section 3.6.4.3*) of ROE and Tobin's Q of all companies, only as an illustration of the interpretation of these ratios.

Table 8: Average ROE/Tobin's Q

	ROE	**Tobin's Q**
Average of all companies	10.412%	1.217
Standard deviation	23.775%	0.966
Coefficient of variance (CV)	2.283	0.794

(Source: IRESS data, analysed by researcher, 2023)

A ROE ratio of 10.412% indicates that a company's net income/profit represents 10.412% of its shareholders' equity. A return of 10.412% is thus, on average, made on the funds that shareholders invested in the companies. As ROE is a positive value, it indicates that the company is profitable; however, to determine whether the return is sufficient, it must be compared to the industry-norm. The standard deviation indicates that there is a 68.3% chance that ROE falls within the range of 10.412% ± 23.775% (Correia, 2019).

An average Tobin's Q ratio of 1.217 (greater than 1) indicates that the companies are overvalued, as its market value is 1.217 times that of their book value (total assets in terms of its replacement costs). This also indicates that the companies, on average, have a good investment-value and will attract potential investors. Once again, even though Tobin's Q exceeds 1, it must be compared to the industry-norm to determine whether it is sufficient or not. The standard deviation indicates that there is a 68.3% chance that Tobin's Q falls within the range of 1.217 ± 0.966 (Correia, 2019).

The Coefficient of variance (CV) is the standard deviation divided by the average, i.e., the standard deviation relatively to the average. A high CV indicates a greater dispersion of the data relatively to the average. ROE's CV of 2.283 indicates that the spread of the data is much higher than the spread of Tobin's Q's data (0.794).

A detailed list of all the companies' ROE and Tobin's Q per year, i.e., before and after COVID-19, is presented in Appendix C.

2.1.2 Empirical objective 2

Empirical objective 2 was stated as follows:

To analyse companies' ESG scores, in total and per pillar, to evaluate their sustainability performance.

To evaluate the sustainability performance of 104 JSE listed companies in the industries that were most severely affected by COVID-19, ESG scores, in total and per pillar, were bought from InvestVerte, an ESG rating provider. To illustrate the interpretation of ESG scores, in total and per pillar, the average scores and standard deviation (also see the descriptive statistics in *Chapter 4*, *section 3.6.4.3)* of all companies are presented in Table 9 below.

Table 9: Average ESG scores

	E-score	S-score	G-score	ESG score
Average of all companies	43.745	70.104	64.941	59.825
Standard deviation	6.350	2.983	1.933	2.829
Coefficient of variance (CV)	0.145	0.043	0.030	0.047

(Source: InvestVerte data, analysed by researcher, 2023)

A score of 0 indicates poor sustainability performance, whereas a score of 100 indicates excellent sustainability performance.

Table 9 presents an E-score of 43.745, which is below average (50). This indicates that companies' actions, on average, do not sufficiently contribute to a sustainable environment. The standard deviation is interpreted similarly to the variables in Table 8 where the 6.35 indicates the 68.3% chance of spread, ± the average. The standard deviation of S-, G- and ESG-score are similarly interpreted.

An S-score of 70.104 indicates good social performance, i.e., companies' actions - on average - positively influence society.

A G-score of 64.941 is a mediocre score – companies' governance actions, on average, are at an acceptable level.

The E-score, S-score and G-score are combined to get and overall ESG score; in this case, an ESG score of 59.825 - which indicates an average sustainability performance.

The CV of the E-, S-, G-, and ESG-score confirms a narrow spread of the data around the mean.

From the data in Table 9 it is clear that the sample companies, on average, perform much better with regard to the social pillar of ESG (S-score of 70.104), i.e., companies value the impact of their actions on, inter alia, customers, employees and suppliers. In contrast, companies seem to focus not much on their environmental impact, as evident in an average E-score of only 43.745.

A detailed list of all the companies' ESG scores, in total and per pillar, per year, i.e. before and after COVID-19, is presented in Appendix D.

2.1.3 Empirical objective 3

Empirical objective 3 was stated as follows:

To establish the relationship between companies' sustainability performance and financial performance.

Empirical objective 3 was partly reached in Chapter 4, where correlation analyses were conducted to identify the co-relationship between the different variables and whether the correlations were statistically significant or not (see *section 3.6.4.6* of *Chapter 4*). Regressions, based on a linear mixed effect model, were conducted on the eight models identified in *section 3.6.4.8* of Chapter 4. The assumptions associated with linear mixed effect models (see *section 3.6.4.7* of *Chapter 4*) were also tested.

The tables for all models include the same statistical terms, which are explained below Table 11.

The eight models, the assumptions tested and their results are separately presented below. The decision as to whether to include the model in interpreting results within the context of multiple theories, is also stated.

Focus was placed on "the "p-value" of "Data", indicating whether the relationship is significant - if the "p-value" indicated a strong or very strong relationship (p<0.05 or p<0.01), the "estimate" was considered, i.e., the direction and strength of the relationship.

2.1.3.1 Model 1

$$ROE = alfa + betaESG + control\ variables^{\#}$$

$^{\#}\ firmSize, Leverage, Liquidity$

Results from the assumptions (see *section 3.6.4.7* of *Chapter 4*), tested for Model 1, are presented in Table 10 below.

Table 10: Multicollinearity – Model 1

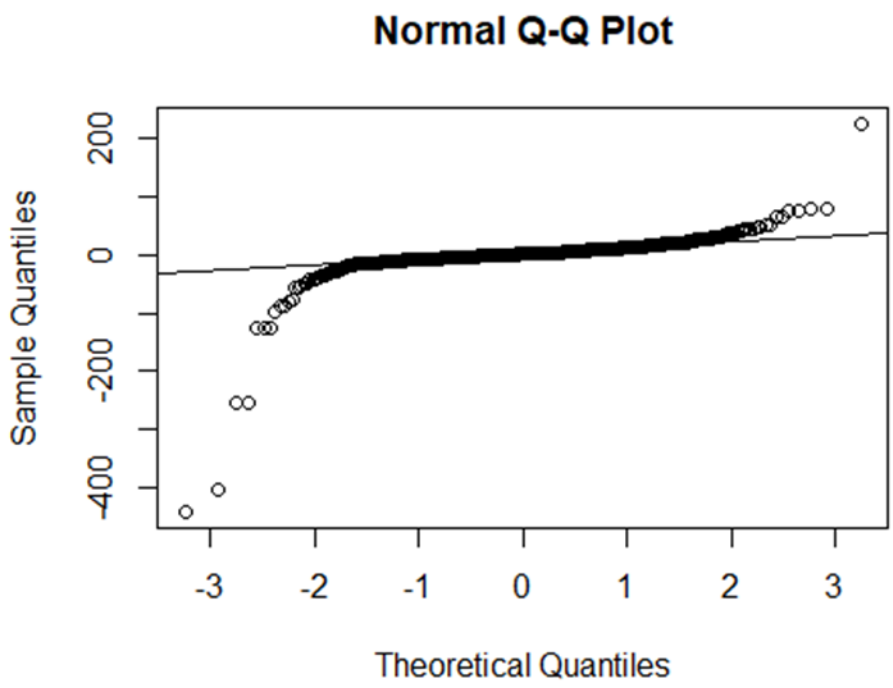
	GVIF
ESG	1.273
Data	1.282
Debt/Asset	1.039
Current ratio	1.033
Total assets	1.015

(Source: R Core Team, 2022 & Bates *et al.*, 2015, analysed by researcher, 2023)

Benchmark: >10 = strong correlation between independent variables.

Table 10 illustrates that all GVIF's are less than 10; therefore, there was no need to eliminate any independent variables.

Figure 9: Normality – Q-Q Plot – Model 1

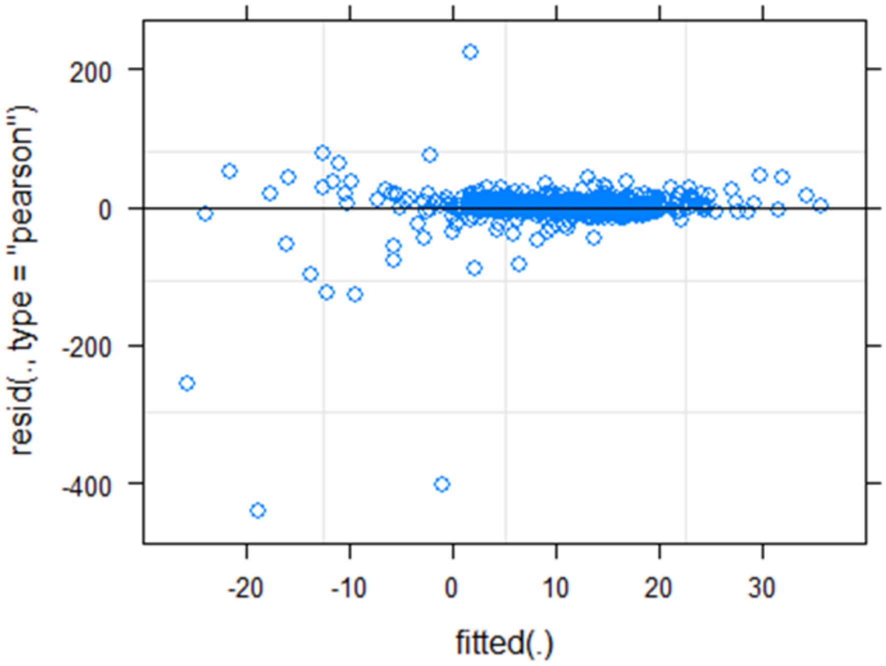


(Source: R Core Team, 2022 & Bates *et al.*, 2015)

Benchmark: Linear pattern = normal distribution

Figure 9 illustrates that the data is normally distributed, as the data points form a linear pattern.

Figure 10: Homoscedasticity – Scatter plot – Model 1



(Source: R Core Team, 2022 & Bates *et al.*, 2015)

Benchmark: Even distribution = homoscedasticity

Figure 10 illustrates that Model 1's residuals have equal variances, as the data points are relatively evenly distributed.

The following results were obtained from the regression analyses:

Table 11: Results – Model 1 (Dependent variable = ROE)

	Estimate[1]	Std error[2]	df[3]	t-value[4]	p-value[5]
(Intercept)	-18.95	29.55	322.5	-0.641	0.522
ESG	0.4661	0.492	316.7	0.947	0.344
[6]**Data2018**	2.569	3.432	762.2	0.749	0.454
Data2019	-4.452	3.423	776.7	-1.3	0.194
Data2021	2.714	3.4	770.6	0.798	0.425
Data2022	5.965	3.604	830.1	1.655	0.098*
Debt/Asset	-4.932	1.388	135.3	-3.553	<0.000***
Current ratio	-0.8752	1.159	738.7	-0.755	0.450
Total assets	2.716	1.429	97.89	1.9	0.060*

*Significance level at 0.1

**Significance level at 0.05

***Significance level at 0.01

(Source: R Core Team, 2022 & Bates *et al.*, 2015)

[1] *"Estimate"* refers to the regression coefficient which indicates how the dependent variable will change for every 1% change in the specific independent variable (Saunders *et al.*, 2019).
[2] *"Std. error"* refers to the standard error of the data, an indication of the reliability of a sample's mean in comparison to the population's mean, i.e., how the data is spread around the mean (Saunders *et al.*, 2019).
[3] *"df"* refers to degrees of freedom, which is the number of independent variables used (Saunders *et al.*, 2019). In the table above, the degrees of freedom are multiplied with the denominators of degrees of freedom.
[4] *"t-value"* refers to test statistic, an indication of the difference between a sample's mean and the standard error of the mean (Saunders *et al.*, 2019).
[5] *"p-value"* refers to the significance of the relationship between variables. A p-value of less than 0.1 indicates a weak relationship, a p-value of less than 0.05 indicates a strong relationship and a p-value of less than 0.01 indicates a very strong relationship (Saunders *et al.*, 2019).
[6] *"Data"* refers to the combination of variables included in the specific model, i.e., the results for each year (2018, 2019, 2021, 2022) considering the independent and control variables applicable to that specific model. *"Data"* thus represents the time aspect of the model and indicates how the dependent variable changes over time, taking into account the exploratory independent variable and also considering the control variables.

The results from Table 11 are interpreted as follows:

Before COVID-19 (2018-2019):

Data2018 and Data2019 are statistically insignificant. The p-values of 0.454 >0.05 and 0.194 >0.05 indicate no relationship between ESG and ROE (taking the control variables into account).

After COVID-19 (2021-2022):

Data2021 and Data2022 are statistically insignificant. The p-value of 0.425 in 2021 indicates that there is no relationship between ESG and ROE (taking the control variables into account). The p-value of 0.098 in 2022 is only at a significance level of 0.1, which indicates a weak relationship between ESG and ROE (taking the control variables into account).

Exploratory independent variable:

ESG is statistically insignificant. A p-value of 0.344 is more than 0.1, which indicates that there is no relationship between ESG and ROE.

Control variables:

Debt/Asset ratio is statistically significant, as its p-value of <0.000 indicates a very strong relationship with ROE. If the Debt/Asset ratio increases with 1%, i.e., debt increases or assets decreases, then ROE decreases with 493.2% and vice versa.

Current ratio is statistically insignificant, as its p-value of 0.450 indicates no relationship with ROE.

Total assets are statistically insignificant, as its p-value of 0.060 is less than 0.1 - which indicates a weak relationship with ROE.

Decision:

As companies' financial performance (ROE) was not significantly impacted by ESG, this relationship was not considered and Model 1 was excluded in interpreting results within the context of multiple theoretical frameworks (see *section 2.2.4*).

2.1.3.2 Model 2

$$ROE = alfa + betaE + betaG + control\ variables\ ^{\#}$$

$^{\#}\ firmSize, Leverage, Liquidity$

Results from the assumptions (see *section 3.6.4.7* of *Chapter 4*) tested for Model 2 are presented below.

Table 12: Multicollinearity – Model 2

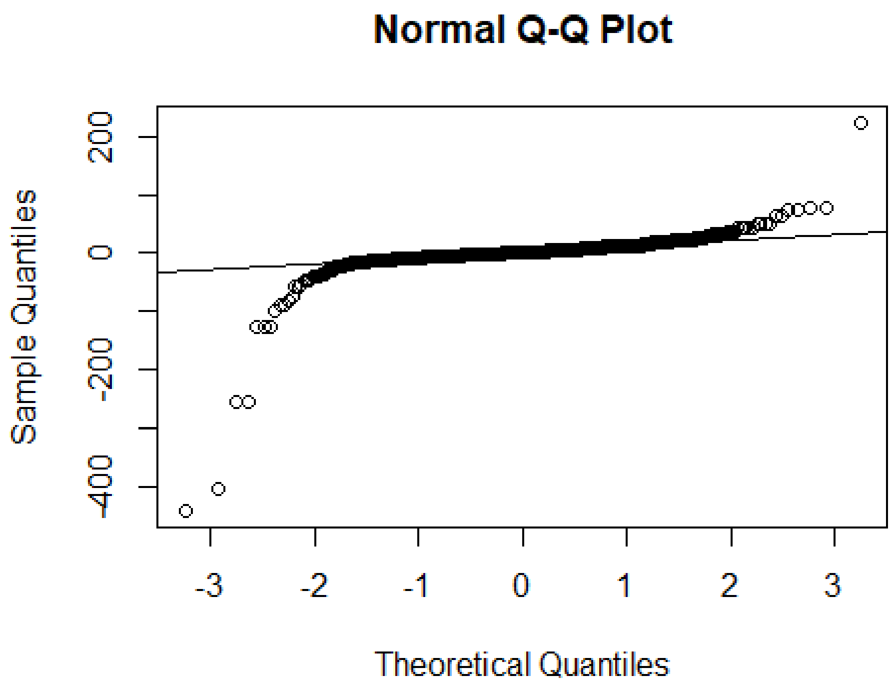
	GVIF
Environment	1.206
Governance	1.225
Data	1.401
Debt/Asset	1.077
Current ratio	1.034
Total assets	1.025

(Source: R Core Team, 2022 & Bates *et al.*, 2015, analysed by researcher)

Benchmark: >10 = strong correlation between independent variables.

Table 12 illustrates that all GVIF's are less than 10; therefore, there was no need to eliminate any independent variables.

Figure 11: Normality – Q-Q Plot – Model 2

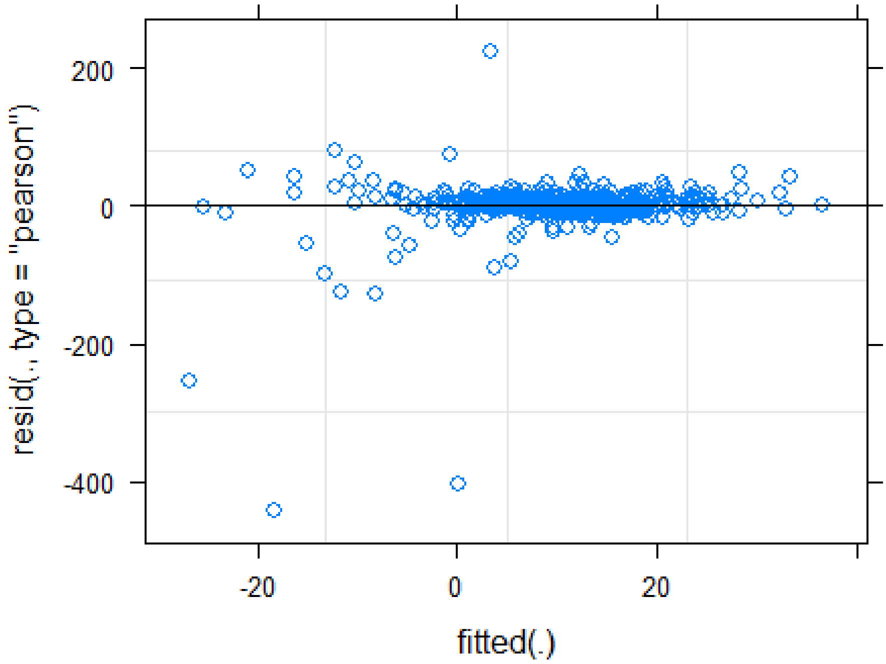


(Source: R Core Team, 2022 & Bates *et al.*, 2015)

Benchmark: Linear pattern = normal distribution

Figure 11 illustrates that the data is normally distributed, as the data points form a linear pattern.

Figure 12: Homoscedasticity – Scatter plot – Model 2



(Source: R Core Team, 2022 & Bates *et al.*, 2015)

Benchmark: Even distribution = homoscedasticity

Figure 12 illustrates that Model 2's residuals have equal variances, as the data points are relatively evenly distributed.

The following results were obtained from the regression analyses:

Table 13: Results – Model 2 (Dependent variable = ROE)

	Estimate	Std. Error	df	t-value	p-value
(Intercept)	-92.08	43.52	433	-2.116	0.035
Environment	-0.120	0.202	456.8	-0.592	0.554
Governance	1.629	0.656	391.3	2.482	0.014**
Data2018	4.158	3.503	787.1	1.187	0.236
Data2019	-3.866	3.435	775.7	-1.125	0.261
Data2021	2.733	3.395	769.9	0.805	0.421
Data2022	6.324	3.618	820.3	1.748	0.081*
Debt/Asset	-5.504	1.397	144.4	-3.939	<0.000***
Current ratio	-1.025	1.155	735.6	-0.888	0.375
Total assets	2.902	1.418	98.77	2.046	0.043**

*Significance level at 0.1

**Significance level at 0.05

***Significance level at 0.01

(Source: R Core Team, 2022 & Bates *et al.*, 2015)

The results from Table 13 are interpreted as follows:

Before COVID-19 (2018-2019):

Data2018 and Data2019 are statistically insignificant. The p-values of 0.236 and 0.261 indicate that there is no relationship between the environmental pillar of ESG and ROE, and between the governance pillar of ESG and ROE (taking the control variables into account).

After COVID-19 (2021-2022):

Data2021 and Data2022 are statistically insignificant. The p-value of 0.421 in 2021 indicates that there is no relationship between the environmental pillar of ESG and ROE, and the governance pillar of ESG and ROE (taking the control variables into account). The p-value of 0.081 in 2022 is only at a significance level of 0.1, which indicates a weak relationship between the environmental pillar of ESG and ROE, and between the governance pillar of ESG and ROE (taking the control variables into account).

Exploratory independent variable:

E is statistically insignificant. A p-value of 0.554 is more than 0.1, which indicates that there is no relationship between E and ROE.

G is statically significant. A p-value of 0.014 is less than 0.05, which indicates that there is a strong relationship between G and ROE. For every 1% increase in the G-score, ROE increases with 162.9%.

Control variables:

Debt/Asset ratio is statistically significant, as its p-value of <0.000 indicates a very strong relationship with ROE. If the Debt/Asset ratio increases with 1%, i.e., debt increases or assets decrease, then ROE decreases with 550.4% and vice versa.

Current ratio is statistically insignificant, as its p-value of 0.375 indicates no relationship with ROE.

Total assets are statistically significant, as its p-value of 0.043 is less than 0.05; therefore, indicating a strong relationship with ROE. If total assets increase with 1%, then ROE increases with 290.2%.

Decision:

Companies' financial performance (ROE) was insignificantly impacted by its environmental activities, but significantly impacted by its governance activities. However, as there was an insignificant impact on ROE before and after COVID-19, this relationship was not considered and Model 2 was excluded in interpreting results within the context of multiple theoretical frameworks (see *section 2.2.4*).

2.1.3.3 Model 3

$$logTobin's\ Q = alfa + betaESG + control\ variables\ ^{\#}$$

$^{\#}\ firmSize, Leverage, Liquidity$

Results from the assumptions (see *section 3.6.4.7* of *Chapter 4*) tested for Model 3 are presented below:

Table 14: Multicollinearity – Model 3

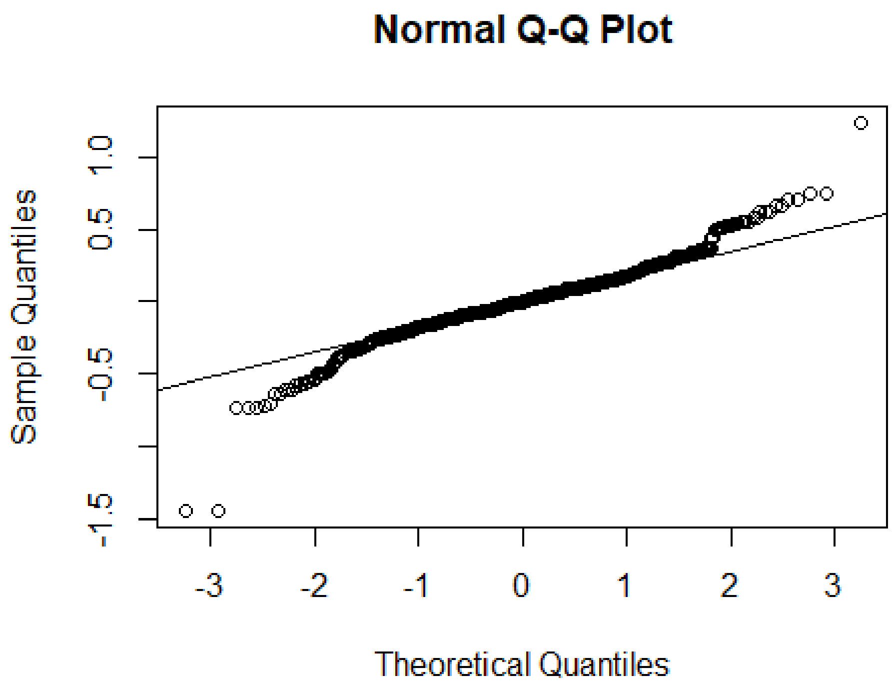
	GVIF
ESG	1.597
Data	1.675
Debt/Asset	1.067
Current ratio	1.062
Total assets	1.088

(Source: R Core Team, 2022 & Bates *et al.*, 2015, analysed by researcher, 2023)

Benchmark: >10 = strong correlation between independent variables

Table 14 illustrates that all GVIF's are less than 10; therefore, there was no need to eliminate any independent variables.

Figure 13: Normality – Q-Q Plot – Model 3

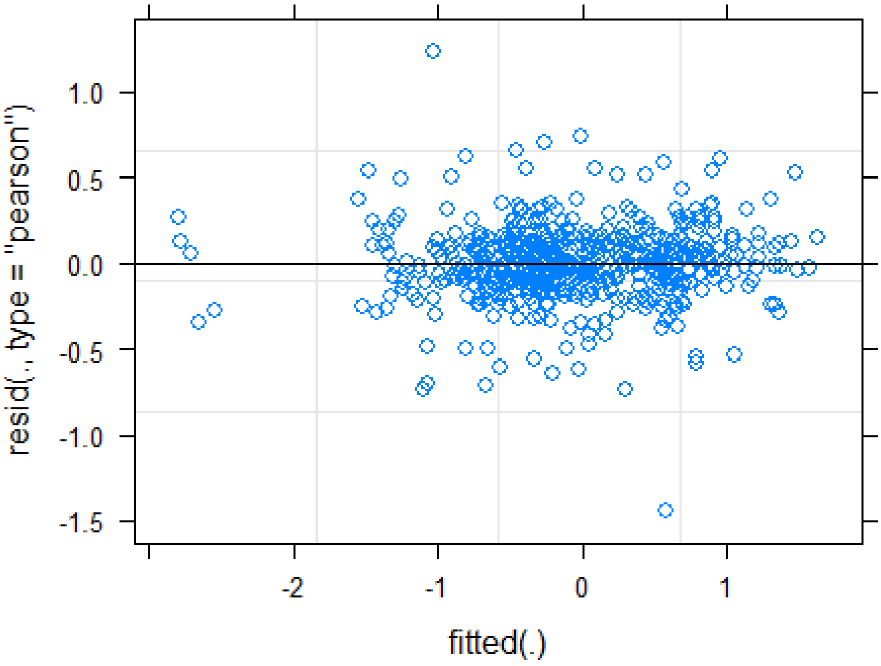


(Source: R Core Team, 2022 & Bates *et al.*, 2015)

Benchmark: Linear pattern = normal distribution

Figure 13 illustrates that the data is normally distributed as the data points form a linear pattern.

Figure 14: Homoscedasticity – Scatter plot – Model 3



(Source: R Core Team, 2022 & Bates *et al.*, 2015)

Benchmark: Even distribution = homoscedasticity

Figure 14 illustrates that Model 3's residuals have equal variances, as the data is relatively evenly distributed.

The following results were obtained from the regression analyses:

Table 15: Results – Model 3 (Dependent variable = logTobin's Q)

	Estimate	Std. Error	df	t-value	p-value
(Intercept)	-0.640	0.349	836.3	-1.834	0.067
ESG	0.013	0.006	801.7	2.276	0.023**
Data2018	-0.108	0.027	750.9	-3.993	<0.000***
Data2019	-0.214	0.027	755.2	-7.826	<0.000***
Data2021	-0.283	0.027	762.2	-10.4	<0.000***
Data2022	-0.387	0.030	766.9	-12.79	<0.000***
Debt/Asset	0.058	0.026	852	2.228	0.026**
Current ratio	0.022	0.011	777.4	1.937	0.053*
Total assets	0.076	0.039	697	1.952	0.051*

*Significance level at 0.1
**Significance level at 0.05
***Significance level at 0.01

(Source: R Core Team, 2022 & Bates *et al.*, 2015)

The results from Table 15 are interpreted as follows:

Before COVID-19 (2018-2019):

Data2018 and Data2019 are statistically significant. The p-values of <0.000 and <0.000 indicate a very strong relationship between ESG and Tobin's Q (taking the control variables into account). The estimate of -0.108 and -0.214 indicate that ESG had an adverse impact on Tobin's Q (taking the control variables into account), i.e., for every 1% increase in a company's ESG, the company's Tobin's Q decreased with 10.8% in 2018 and with 21.4% in 2019.

After COVID-19 (2021-2022):

Data2021 and Data2022 are statistically significant. The p-values of <0.000 and <0.000 indicate a very strong relationship between and Tobin's Q (taking the control variables into account). The estimate of -0.283 and -0.387 indicate that had an adverse impact on Tobin's Q (taking the control variables into account), i.e., for every 1% increase in a company's ESG, the company's Tobin's Q decreased with 28.3% in 2021 and with 38.7% in 2022.

Exploratory independent variable:

ESG is statistically significant. A p-value of 0.023 is less than 0.05, which indicates that there is a strong relationship between ESG and Tobin's Q. For every 1% increase in the ESG-score, Tobin's Q increases with 1.3%.

Control variables:

Debt/Asset ratio is statistically significant, as its p-value of 0.026 indicates a strong relationship with Tobin's Q. If the Debt/Asset ratio increases with 1%, i.e., debt increases or assets decrease, then Tobin's Q increases with 5.8% and vice versa.

Current ratio is statistically insignificant, as its p-value of 0.053 (slightly above 0.05) indicates a weak relationship with Tobin's Q.

Total assets are statistically insignificant, as its p-value of 0.051 (slightly above 0.05) indicates a weak relationship with Tobin's Q.

Decision:

Companies' financial performance (Tobin's Q) was significantly impacted by ESG. Since there was a significant relationship between financial and sustainability performance before and after COVID-19, Model 3 was considered in interpreting results within the context of multiple theoretical frameworks (see *section 2.2.4*).

2.1.3.4 Model 4

$$logTobin's\ Q = alfa + betaE + betaS + control\ variables\ ^{\#}$$

$^{\#}\ firmSize, Leverage, Liquidity$

Results from the assumptions (see *section 3.6.4.7* of *Chapter 4*) tested for Model 4 are presented below:

Table 16: Multicollinearity – Model 4

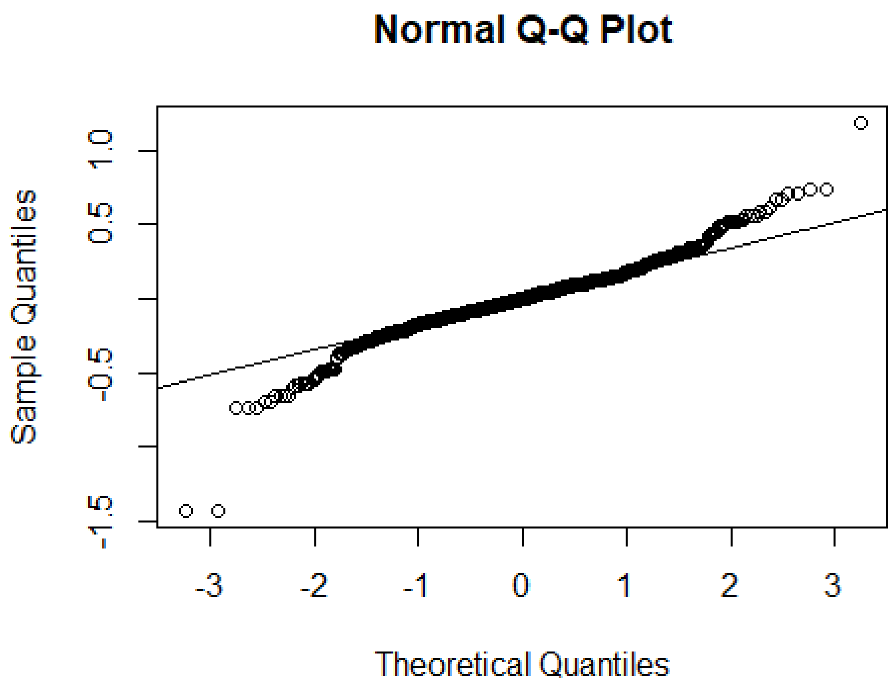
	GVIF
Environment	1.409
Social	1.157
Data	1.673
Debt/Asset	1.068
Current ratio	1.062
Total assets	1.077

(Source: R Core Team, 2022 & Bates *et al.*, 2015, analysed by researcher)

Benchmark: >10 = strong correlation between independent variables

Table 16 illustrates that all GVIF's are less than 10; therefore, there was no need to eliminate any independent variables.

Figure 15: Normality – Q-Q Plot – Model 4

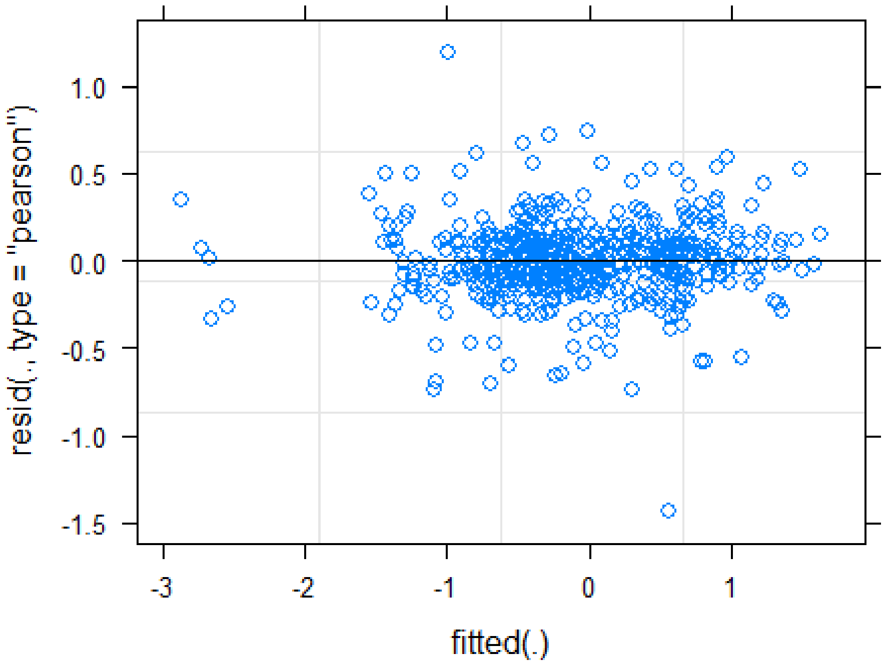


(Source: R Core Team, 2022 & Bates *et al.*, 2015)

Benchmark: Linear pattern = normal distribution

Figure 15 illustrates that the data is normally distributed as the data points form a linear pattern.

Figure 16: Homoscedasticity – Scatter plot – Model 4



(Source: R Core Team, 2022 & Bates *et al.*, 2015)

Benchmark: Linear pattern = homoscedasticity

Figure 16 illustrates that Model 4's residuals have equal variances, as the data points are relatively evenly distributed.

The following results were obtained from the regression analyses:

Table 17: Results – Model 4 (Dependent variable = logTobin's Q)

	Estimate	Std. Error	df	t-value	p-value
(Intercept)	0.864	0.494	838.8	1.751	0.080
Environment	0.001	0.002	779.4	0.612	0.541
Social	-0.011	0.007	825.5	-1.696	0.090*
Data2018	-0.114	0.027	748.2	-4.241	<0.000***
Data2019	-0.230	0.027	753	-8.46	<0.000***
Data2021	-0.282	0.027	760.3	-10.38	<0.000***
Data2022	-0.357	0.030	769.6	-11.7	<0.000***
Debt/Asset	0.059	0.026	851	2.297	0.022**
Current ratio	0.019	0.011	775.5	1.736	0.083*
Total assets	0.082	0.039	715.6	2.106	0.033**

*Significance level at 0.1

**Significance level at 0.05

***Significance level at 0.01

(Source: R Core Team, 2022 & Bates *et al.*, 2015)

The results from Table 17 are interpreted as follows:

Before COVID-19 (2018-2019):

Data2018 and Data2019 are statistically significant. The p-values of <0.000 and <0.000 indicate that there is a very strong relationship between the environmental pillar of ESG and Tobin's Q, and between the social pillar of ESG and Tobin's Q (taking the control variables into account). The negative estimate of -0.114 and -0.230 indicate that the environmental pillar of ESG and the social pillar of ESG had an adverse impact on Tobin's Q (taking the control variables into account), i.e., for every 1% increase in a company's E-score and S-score, the company's Tobin's Q decreased with 11.4% in 2018 and with 23% in 2019.

After COVID-19 (2021-2022):

Data2021 and Data2022 are statistically significant. The p-values of <0.000 and <0.000 indicate that the environmental pillar of ESG and the social pillar of ESG had a significant impact on Tobin's Q (taking the control variables into account). The negative estimate of -0.282 and -0.357 indicate that the environmental pillar of ESG and the social pillar of ESG had an adverse impact on Tobin's Q (taking the control variables into account), i.e., for every 1% increase in a company's E-score and S-score, the company's Tobin's Q decreased with 28.2% in 2021 and with 35.7% in 2022.

Exploratory independent variable:

E is statistically insignificant. A p-value of 0.541 is more than 0.1, which indicates that there is no relationship between E and Tobin's Q.

S is also statically insignificant. A p-value of 0.090 is only at a significance level of 0.1, which indicates that there is a weak relationship between S and Tobin's Q.

Control variables:

Debt/Asset ratio is statistically significant, as its p-value of 0.022 indicates a strong relationship with Tobin's Q. If the Debt/Asset ratio increases with 1%, i.e., debt increases or assets decrease, then Tobin's Q increases with 5.9% and vice versa.

Current ratio is statistically insignificant, as its p-value of 0.083 indicates a weak relationship with Tobin's Q.

Total assets are statistically significant, as its p-value of 0.033 indicates a strong relationship with Tobin's Q. If total assets increase with 1%, then Tobin's Q increases with 8.2%.

Decision:

Companies' financial performance (Tobin's Q) was insignificantly impacted by its environmental and social activities. However, since there was a significant relationship between financial and sustainability performance before and after COVID-19, Model 4 was considered in interpreting results within the context of multiple theoretical frameworks (see *section 2.2.4*).

2.1.3.5 Model 5

$$ESG = alfa + betaROE + betaTobin's\ Q + control\ variables^{\#}$$

$^{\#}$ $firmSize, Leverage, Liquidity$

Results from the assumptions (see *section 3.6.4.7* of *Chapter 4*) tested for Model 5 are presented below.

Table 18: Multicollinearity – Model 5

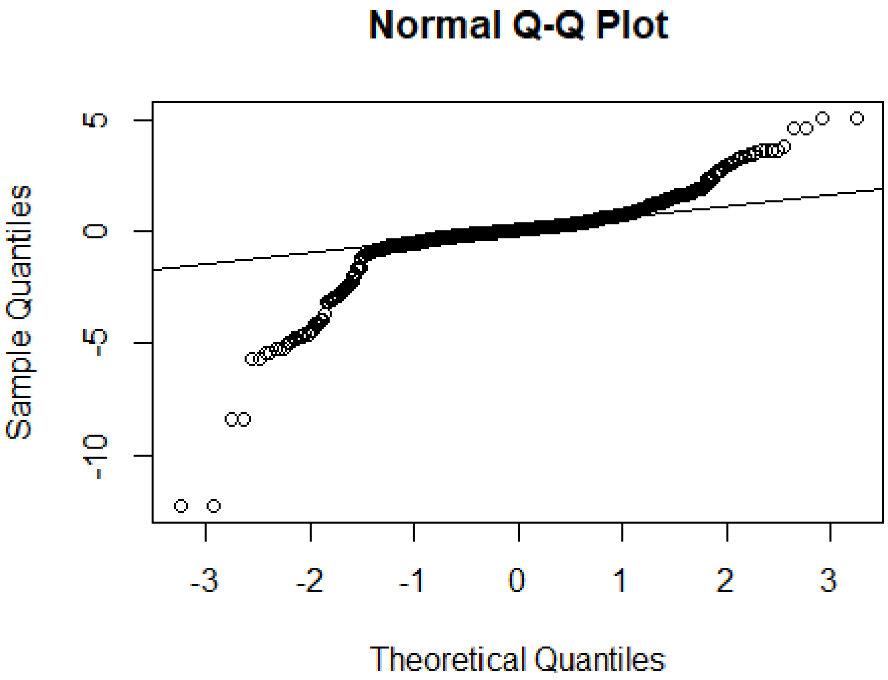
	GVIF
ROE	1.046
Tobin's Q	1.212
Data	1.307
Debt/Asset	1.075
Current ratio	1.047
Total assets	1.044

(Source: R Core Team, 2022 & Bates *et al.*, 2015, analysed by researcher, 2023)

Benchmark: >10 = strong correlation between independent variables

Table 19 illustrates that all GVIF's are less than 10; therefore, there was no need to eliminate any independent variables.

Figure 17: Normality – Q-Q Plot – Model 5

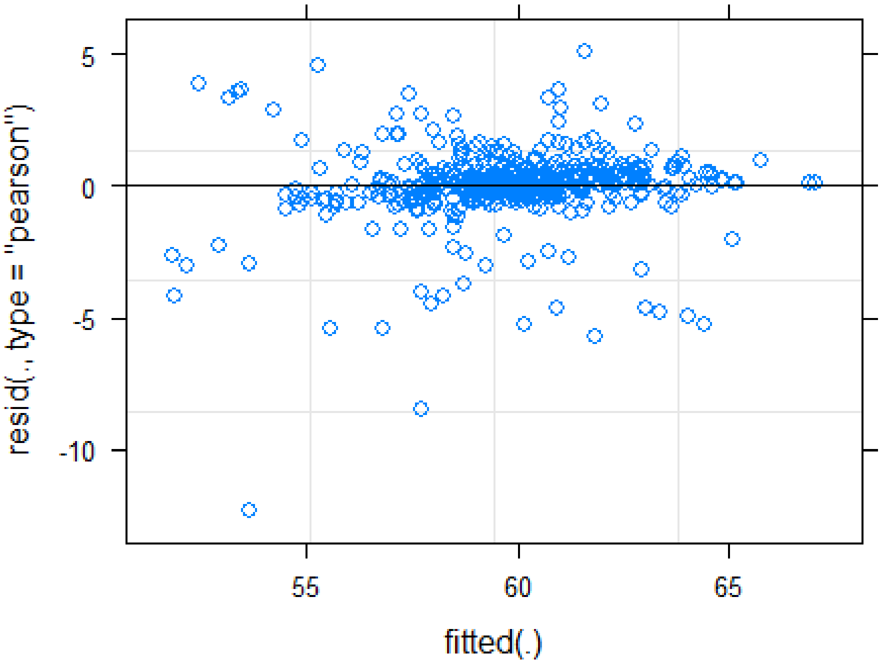


(Source: R Core Team, 2022 & Bates *et al.*, 2015)

Benchmark: Linear pattern = normal distribution

Figure 17 illustrates that the data is normally distributed, as the data points form a linear pattern.

Figure 18: Homoscedasticity – Scatter plot – Model 5



(Source: R Core Team, 2022 & Bates *et al.*, 2015)

Benchmark: Even distribution = homoscedasticity

Figure 18 illustrates that Model 5's residuals have equal variances, as the data points are relatively evenly distributed.

The following results were obtained from the regression analyses:

Table 19: Results – Model 5 (Dependent variable = ESG)

	Estimate	Std. Error	df	t-value	p-value
(Intercept)	59.36	0.306	261.9	194.3	<0.000
ROE	0.002	0.002	761.8	1.029	0.304
Tobin's Q	0.220	0.119	767.3	1.858	0.064*
Data2018	-0.500	0.17	747.7	-2.941	0.003***
Data2019	-0.864	0.173	766.1	-4.985	<0.000***
Data2021	0.062	0.179	788.4	0.347	0.729
Data2022	2.318	0.186	806.2	12.48	<0.000***
Debt/Asset	0.105	0.141	552.3	0.743	0.458
Current ratio	-0.188	0.068	823.8	-2.785	0.005***
Total assets	0.339	0.183	258	1.851	0.065*

*Significance level at 0.1

**Significance level at 0.05

***Significance level at 0.01
(Source: R Core Team, 2022 & Bates *et al.*, 2015)

The results from Table 19 are interpreted as follows:

Before COVID-19 (2018-2019):

Data2018 and Data2019 are statistically significant. The p-values of 0.003 and <0.000 indicate that there is a very strong relationship between ROE and ESG, and between Tobin’s and ESG (taking the control variables into account). The negative estimates of -0.5 and -0.864 indicate that ROE and Tobin’s Q have an adverse impact on ESG (taking the control variables into account), i.e., for every 1% increase in a company’s ROE and Tobin’s Q, the company’s ESG score decreased with 50% in 2018 and with 86.4% in 2019.

After COVID-19 (2021-2022):

Data2021 is statistically insignificant, but Data2022 is statistically significant. The p-values of 0.729 and <0.000 indicate that there was no relationship between ROE and ESG, and between Tobin’s Q and ESG (taking the control variables into account) in 2021, but a very strong relationship in 2022. The estimate 2.318 indicates that ROE and Tobin’s Q had a favourable impact on ESG (taking the control variables into account) in 2022, i.e., for every 1% increase in a company’s ROE and Tobin’s Q, the company’s ESG score increased with 231.8% in 2022.

Exploratory independent variables:

ROE is statistically insignificant. A p-value of 0.304 is more than 0.1, which indicates that there is no relationship between ROE and ESG.

Tobin’s Q is also statically insignificant. A p-value of 0.064 is only at a significance level of 0.1, which indicates that there is a weak relationship between Tobin’s Q and ESG.

Control variables:

Debt/Asset ratio is statistically insignificant, as its p-value of 0.458 indicates that there is no relationship with ESG.

Current ratio is statistically significant, as its p-value of 0.005 indicates a very strong relationship with ESG. For every 1% increase in the current ratio, ESG decreased with 18.8%.

Total assets are statistically insignificant, as its p-value of 0.065 indicates a weak relationship with ESG.

Decision:

Companies' sustainability performance (ESG) was insignificantly impacted by its ROE and Tobin's Q. However, since there was as significant relationship between sustainability and financial performance before and after COVID-19, Model 5 was considered in interpreting results within the context of multiple theoretical frameworks (see *section 2.2.4*).

2.1.3.6 Model 6

$$E = alfa + betaROE + betaTobin's\ Q + control\ variables\ ^{\#}$$

$^{\#}\ firmSize, Leverage, Liquidity$

Results from the assumptions (see *section 3.6.4.7* of *Chapter 4*) tested for Model 6 are presented below.

Table 20: Multicollinearity – Model 6

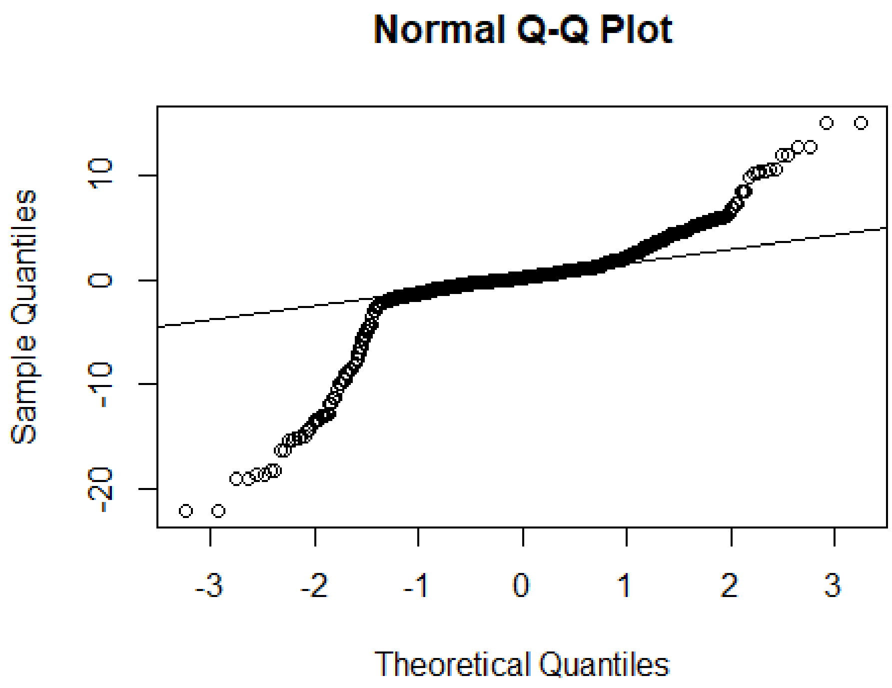
	GVIF
ROE	1.047
Tobin's Q	1.185
Data	1.245
Debt/Asset	1.068
Current ratio	1.041
Total assets	1.031

(Source: R Core Team, 2022 & Bates *et al.*, 2015, analysed by researcher, 2023)

Benchmark: >10 = strong correlation between independent variables

Table 20 illustrates that all GVIF's are less than 10; therefore, there was no need to eliminate any independent variables.

Figure 19: Normality – Q-Q Plot – Model 6

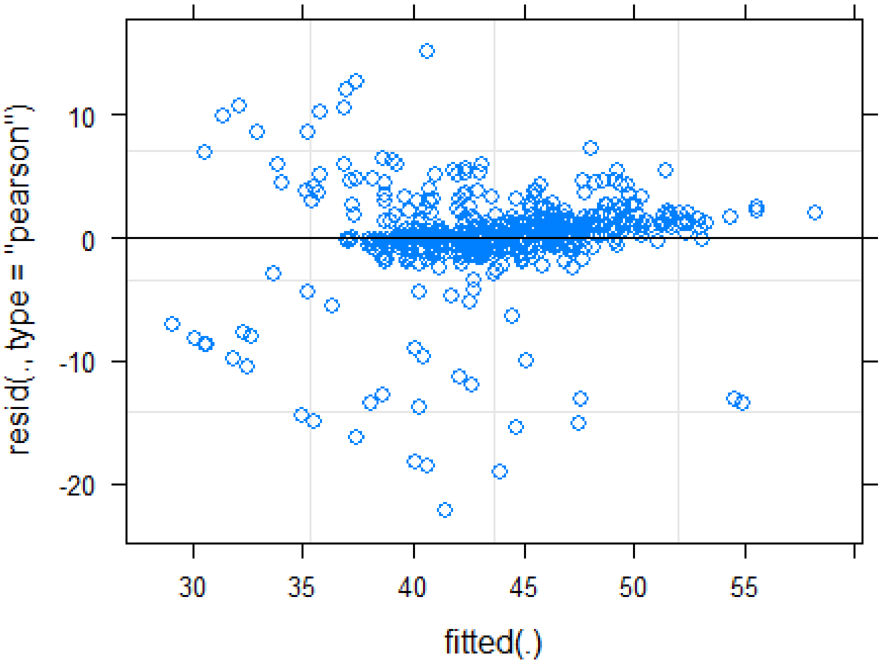


(Source: R Core Team, 2022 & Bates *et al.*, 2015)

Benchmark: Linear pattern = normal distribution

Figure 19 illustrates that the data is normally distributed, as the data points form a linear pattern.

Figure 20: Homoscedasticity – Scatter plot – Model 6



(Source: R Core Team, 2022 & Bates *et al.*, 2015)

Benchmark: Even distribution = homoscedasticity

Figure 20 illustrates that Model 6's residuals have equal variances, as the data points are evenly distributed.

The following results were obtained from the regression analyses:

Table 21: Results – Model 6 (Dependent variable = Environment)

	Estimate	Std. Error	df	t-value	p-value
(Intercept)	43.36	0.714	309	60.74	<0.000
ROE	0.003	0.005	779.1	0.507	0.612
Tobin's Q	-0.2017	0.303	530.7	-0.666	0.506
Data2018	-0.575	0.478	751.9	-1.203	0.229
Data2019	-1.607	0.485	775.9	-3.314	<0.001***
Data2021	-0.039	0.498	801.1	-0.078	0.938
Data2022	5.139	0.514	820.4	9.999	<0.000***
Debt/Asset	-0.188	0.344	328.9	-0.547	0.585
Current ratio	-0.442	0.185	849.6	-2.386	0.017**
Total assets	-0.115	0.411	167	-0.280	0.780

*Significance level at 0.1

**Significance level at 0.05

***Significance level at 0.01
(Source: R Core Team, 2022 & Bates *et al.*, 2015)

The results from Table 21 are interpreted as follows:

<u>Before COVID-19 (2018-2019):</u>

Data2018 is statistically insignificant, but Data2019 is statistically significant. The p-values of 0.229 and <0.001 indicate that there was no relationship between ROE and E, and between Tobin's Q and E (taking the control variables into account) in 2018, but a very strong relationship between ROE and E, and between Tobin's Q and E (taking the control variables into account) in 2019. The negative estimate of -1.607 indicates that ROE and Tobin's Q had an adverse impact on the environmental pillar of ESG in 2019, i.e., for every 1% increase in a company's ROE and Tobin's Q, the company's E-score decreased with 160.7% in 2019.

<u>After COVID-19 (2021-2022):</u>

Data2021 is statistically insignificant, but Data2022 is statistically significant. The p-values of 0.938 and <0.000 indicate that there was no relationship between ROE and E, and between Tobin's Q and E (taking the control variables into account) in 2021, but a very strong relationship between ROE and E, and between Tobin's Q and E (taking the control variables into account) in 2022. The estimate of 5.139 indicates that ROE and Tobin's Q had a favourable impact on the environmental pillar of ESG in 2022, i.e., for every 1% increase in a company's ROE and Tobin's Q, the company's E-score increased with 513.9% in 2022.

<u>Exploratory independent variable:</u>

ROE is statistically insignificant. A p-value of 0.612 is more than 0.1, which indicates that there is no relationship between ROE and E.

Tobin's Q is also statically insignificant. A p-value of 0.506 indicates that there is no relationship between Tobin's Q and E.

<u>Control variables:</u>

Debt/Asset ratio is statistically insignificant, as its p-value of 0.585 indicates that there is no relationship with E.

Current ratio is statistically significant, as its p-value of 0.017 indicates a strong relationship with E. For every 1% increase in the current ratio, E decreased with 44.2%.

Total assets are statistically insignificant, as its p-value of 0.780 indicates that there is no relationship with E.

Decision:

Companies' environmental performance (E) was insignificantly impacted by its ROE and Tobin's Q. However, since there was as significant relationship between sustainability and financial performance before and after COVID-19, Model 6 was considered in interpreting results within the context of multiple theoretical frameworks (see *section 2.2.4*).

2.1.3.7 Model 7

$$S = alfa + betaTobin's\ Q + control\ variables\ ^{\#}$$

$^{\#}\ firmSize, Leverage, Liquidity$

Results from the assumptions (see *section 3.6.4.7* of *Chapter 4*) tested for Model 7 are presented below.

Table 22: Multicollinearity – Model 7

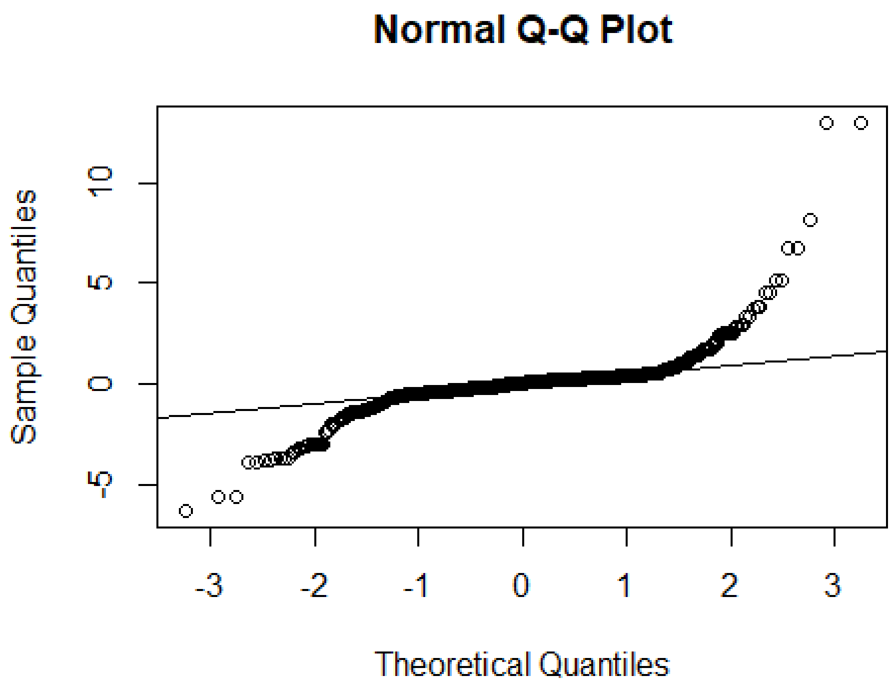
	GVIF
Tobin's Q	1.228
Data	1.323
Debt/Asset	1.062
Current ratio	1.050
Total assets	1.057

(Source: R Core Team, 2022 & Bates *et al.*, 2015, analysed by researcher, 2023)

Benchmark: >10 = strong correlation between independent variables.

Table 22 illustrates that all GVIF's are less than 10; therefore, there was no need to eliminate any independent variables.

Figure 21: Normality – Q-Q Plot – Model 7

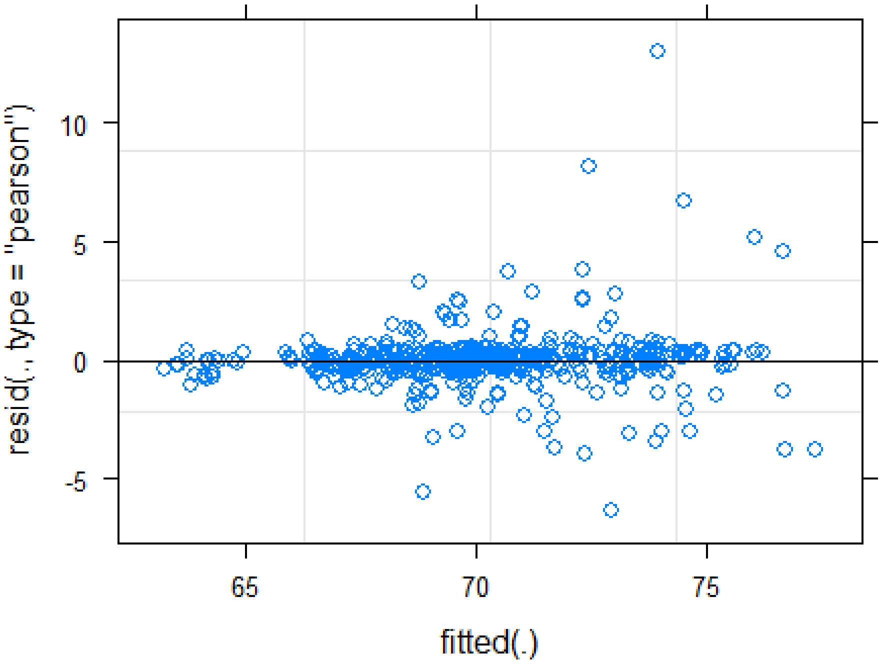


(Source: R Core Team, 2022 & Bates *et al.*, 2015)

Benchmark: Linear pattern = normal distribution

Figure 21 illustrates that the data is normally distributed, as the data points form a linear pattern.

Figure 22: Homoscedasticity – Scatter plot – Model 7



(Source: R Core Team, 2022 & Bates *et al.*, 2015)

Benchmark: Even distribution = homoscedasticity

Figure 22 illustrates that Model 7's residuals have equal variances, as the data points are relatively evenly distributed.

The following results were obtained from the regression analyses:

Table 23: Results – Model 7 (Dependent variable = Social)

	Estimate	Std. Error	df	t-value	p-value
(Intercept)	70.22	0.327	216.2	214.5	<0.000
Tobin's Q	-0.139	0.109	851	-1.274	0.203
Data2018	0.023	0.149	753.3	0.151	0.880
Data2019	-0.588	0.152	764.8	-3.867	<0.001***
Data2021	0.068	0.157	781.4	0.435	0.664
Data2022	0.708	0.164	795.6	4.331	<0.000***
Debt/Asset	0.120	0.134	780.6	0.899	0.369
Current ratio	-0.023	0.060	799	-0.388	0.698
Total assets	-0.29	0.188	450.9	-1.59	0.113

*Significance level at 0.1

**Significance level at 0.05

***Significance level at 0.01

(Source: R Core Team, 2022 & Bates *et al.*, 2015)

The results from Table 23 are interpreted as follows:

Before COVID-19 (2018-2019):

Data2018 is statistically insignificant, but Data2019 is statistically significant. The p-values of 0.880 and <0.001 indicate that there was no relationship between Tobin's Q and S (taking the control variables into account) in 2018, but a very strong relationship between Tobin's Q and S (taking the control variables into account) in 2019. The negative estimate of -0.588 indicates that Tobin's Q had an adverse impact on the social pillar of ESG in 2019, i.e., for every 1% increase in a company's Tobin's Q, the company's S-score decreased with 58.8% in 2019.

After COVID-19 (2021-2022):

Data2021 is statistically insignificant, but Data2022 is statistically significant. The p-values of 0.664 and <0.001 indicate that there was no relationship between Tobin's and S (taking the control variables into account) in 2021, but a very strong relationship between Tobin's Q and S (taking the control variables into account) in 2022. The estimate of 0.708 indicates that Tobin's Q had a favourable impact on the social pillar of ESG in 2022, i.e., for every 1% increase in a company's Tobin's Q, the company's S-score increased with 70.8% in 2022.

Exploratory variable:

Tobin's Q is statically insignificant. A p-value of 0.203 indicates that there is no relationship between Tobin's Q and S.

Control variables:

Debt/Asset ratio is statistically insignificant, as its p-value of 0.369 indicates that there is no relationship with S.

Current ratio is statistically insignificant, as its p-value of 0.698 indicates that there is no relationship with S.

Total assets are statistically insignificant, as its p-value of 0.113 indicates that there is no relationship with S.

Decision:

Companies' social performance (S) was insignificantly impacted by its Tobin's Q. However, since there was a significant relationship between sustainability and financial performance before and after COVID-19, Model 7 was considered in interpreting results within the context of multiple theoretical frameworks (see *section 2.2.4*).

2.1.3.8 Model 8

$$G = alfa + betaROE + control\ variables\ ^{\#}$$

$^{\#}\ firmSize, Leverage, Liquidity$

Results from the assumptions (see *section 3.6.4.7* of *Chapter 4*) tested for Model 8 are presented below.

Table 24: Multicollinearity – Model 8

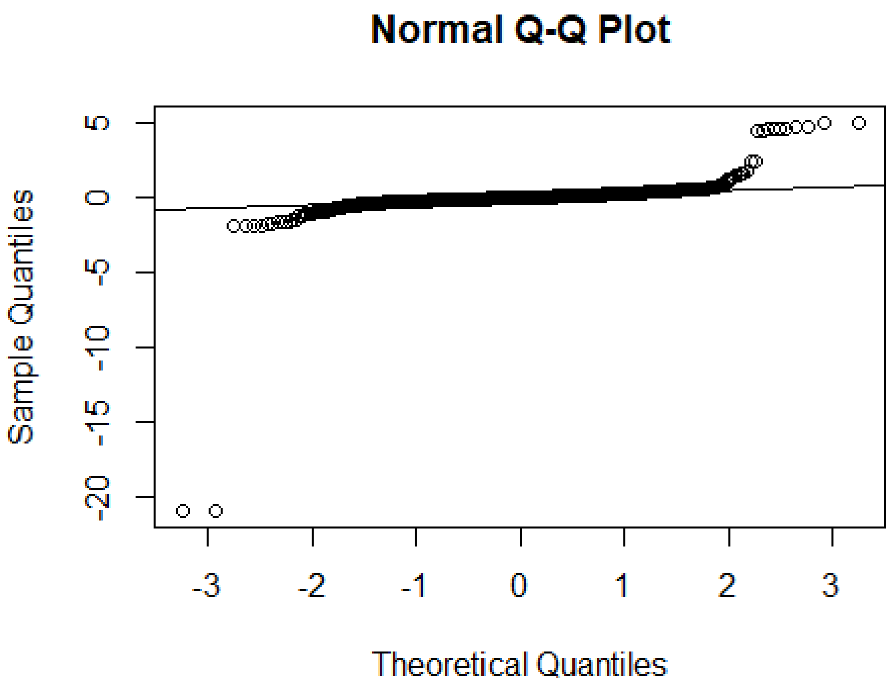
	GVIF
ROE	1.033
Data	1.071
Debt/Asset	1.065
Current ratio	1.041
Total assets	1.035

(Source: R Core Team, 2022 & Bates *et al.*, 2015, analysed by researcher)

Benchmark: >10 = strong correlation between independent variables

Table 24 illustrates that all GVIF's are less than 10; therefore, there was no need to eliminate any independent variables.

Figure 23: Normality – Q-Q Plot – Model 8

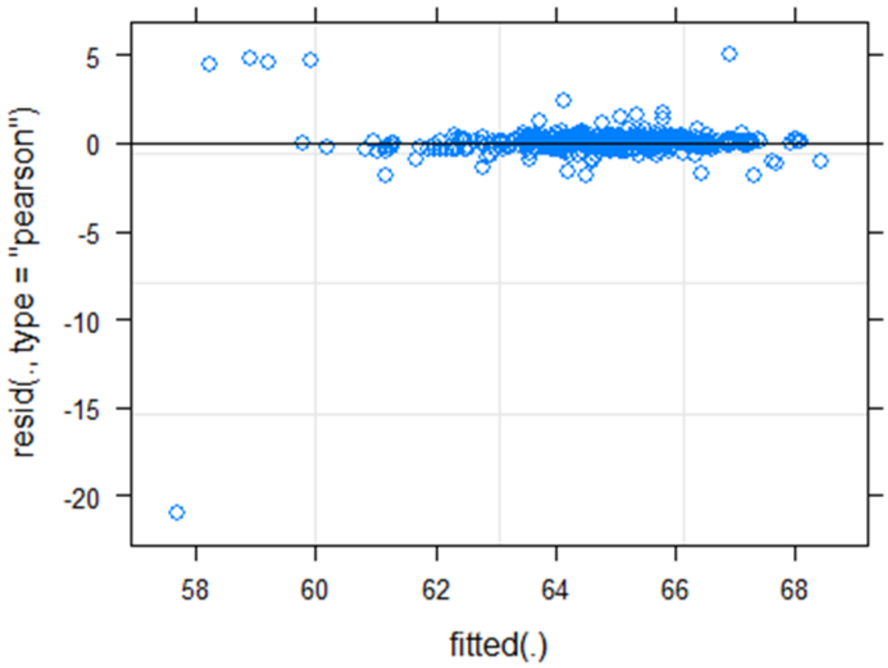


(Source: R Core Team, 2022 & Bates *et al.*, 2015)

Benchmark: Linear pattern = normal distribution

Figure 23 illustrates that the data is normally distributed, as the data points form a linear pattern.

Figure 24: Homoscedasticity – Scatter plot – Model 8



(Source: R Core Team, 2022 & Bates *et al.*, 2015)

Benchmark: Even distribution = homoscedasticity

Figure 24 illustrates that Model 8's residuals have equal variances, as the data points are relatively evenly distributed.

The following results were obtained from the regression analyses:

Table 25: Results – Model 8 (Dependent variable = Governance)

	Estimate	Std. Error	df	t-value	p-value
(Intercept)	65.11	0.172	170	379.2	<0.000
ROE	0.003	0.002	770.6	2.186	0.029**
Data2018	-1.186	0.140	735.1	-8.503	<0.000***
Data2019	-0.714	0.139	738.1	-5.146	<0.000***
Data2021	0.019	0.140	754.7	0.136	0.892
Data2022	0.766	0.142	765.4	5.399	<0.000***
Debt/Asset	0.079	0.107	376.3	0.738	0.461
Current ratio	-0.002	0.055	842.7	-0.031	0.975
Total assets	0.113	0.132	180	0.860	0.391

*Significance level at 0.1

**Significance level at 0.05

***Significance level at 0.01

(Source: R Core Team, 2022 & Bates *et al.*, 2015)

The results from Table 25 are interpreted as follows:

Before COVID-19 (2018-2019):

Data2018 and Data2019 are statistically significant. The p-values of <0.000 and <0.000 indicate that there was a very strong relationship between ROE and the governance pillar of ESG (taking the control variables into account) in 2018 and 2019. The negative estimate of -1.186 and -0.714 indicate that ROE had an adverse impact on the governance pillar of ESG, i.e., for every 1% increase in a company’s ROE, the company’s G-score decreased with 118.6% in 2018 and with 71.4% in 2019.

After COVID-19 (2021-2022):

Data2021 is statistically insignificant, but Data2022 is statistically significant. The p-values of 0.892 and <0.001 indicate that there was no relationship between ROE and G (taking the control variables into account) in 2021, but a very strong relationship between ROE and G (taking the control variables into account) in 2022. The estimate of 0.766 indicates that ROE had a favourable impact on the governance pillar of ESG in 2022, i.e., for every 1% increase in a company’s ROE, the company’s G-score increased with 76.6% in 2022.

Exploratory independent variable:

ROE is statistically significant. A p-value of 0.029 is less than 0.05, which indicates that there is a strong relationship between G and ROE. If ROE increases with 1%, the G-score increases with 0.03%.

Control variables:

Debt/Asset ratio is statistically insignificant, as its p-value of 0.461 indicates that there is no relationship with G.

Current ratio is statistically insignificant, as its p-value of 0.975 indicates that there is no relationship with G.

Total assets are statistically insignificant, as its p-value of 0.391 indicates that there is no relationship with G.

Decision:

Companies' governance performance (G) was significantly impacted by its ROE. Since there was a significant relationship between sustainability and financial performance before and after COVID-19, Model 8 was considered in interpreting results within the context of multiple theoretical frameworks (see *section 2.2.4*).

2.1.3.9 Model selection

As noted in *section 3.6.4.2* and *3.6.4.4* of Chapter 4, there were two possible directions for considering the relationship between financial and sustainability performance:

(a) Financial performance = alfa + sustainability performance (beta)
(b) Sustainability performance = alfa + financial performance (beta)

As there was an insignificant relationship between ROE and ESG, only Models 3 and 4, which include Tobin's Q as a measure of financial performance, were considered for (a) and Models 5 to 8 were considered for (b) (see *section 2.2.3*).

Model 3 revealed that ESG had a negative impact on Tobin's Q before and after COVID-19, whereas Model 4 revealed that the environmental and social pillars of ESG had a negative impact on Tobin's Q before and after COVID-19. Therefore, as the E-score and G-score are incorporated into the ESG score, Model 3 was used in interpreting (a)'s results within the context of multiple theories.

Model 5 revealed that ROE and Tobin's Q had a negative impact on ESG before COVID-19 and a positive impact on ESG after COVID-19. Model 6 revealed that ROE and Tobin's Q had a negative impact on the environmental pillar of ESG before COVID-19 and a positive impact after COVID-19. Model 7 revealed that Tobin's Q had a negative impact on the social pillar of ESG before COVID-19 and a positive impact after COVID-19. Model 8 revealed that ROE had a negative impact on the governance pillar of EGS before COVID-19 and a positive impact after COVID-19. Therefore, as Models 5 to 8 showed similar results, Model 5, which includes all the ESG pillars, was used in interpreting (b)'s results within the context of multiple theories.

In summary, Model 3 revealed that sustainability performance (ESG) had a *negative* impact on companies' financial performance (Tobin's Q) *before* COVID-19 and also that sustainability performance (ESG) had a *negative* impact on companies' financial performance (Tobin's Q) *after* COVID-19.

Model 5 revealed that financial performance (ROE and Tobin's Q) had a *negative* impact on companies' sustainability performance (ESG) *before* COVID-19, but financial performance (ROE and Tobin's Q) had a *positive* impact on companies' sustainability performance (ESG) *after* COVID-19.

Table 26 summarises the results of (a) and (b).

Table 26: Summarised results

	Before COVID-19	**After COVID-19**
(a) Impact of SP[1] on FP[2]	Negative	Negative
(b) Impact of FP[3] on SP[1]	Negative	Positive

[1] ESG

[2] Tobin's Q (not ROE, because there was an insignificant relationship between ESG and ROE)

[3] ROE and Tobin's Q

(Source: Researcher's own contribution, 2023)

Table 26 presents the relationship between financial and sustainability performance before and after COVID-19; thereby satisfying empirical objective 3.

2.1.4 Empirical objective 4

Empirical objective 4 was stated as follows:

To demonstrate how the interpretation of the relationship between companies' financial performance and sustainability performance (before and after COVID-19) is impacted when considered within the context of six selected theories.

By making use of Model 3 and Model 5, the results for (a) and (b) were interpreted within the context of stakeholder-, stewardship-, signalling-, shareholder-, resource-based- and legitimacy theory.

Table 26 presented the summarised results, together with the measurement of financial performance (FP) and sustainability performance (SP) and was used to interpret the results within the context of multiple theoretical frameworks.

There were no neutral relationships between financial and sustainability performance before or after COVID-19; therefore, only positive or negative relationships were interpreted. If the relationship was negative (see *Table 26*), there was no interpretation of positive results, and vice versa. The interpretation is presented in Table 27.

Table 27: Interpretation of results within the context of multiple theoretical frameworks

Relationship between:	Before COVID-19 (No crisis)	After COVID-19 (No crisis/Recovering from a crisis)
ROE/Tobin's Q & ESG	**Stakeholder theory**	
→ *Positive*	(a) N/A (b) N/A	(a) N/A (b) Companies' sustainability performance, after a crisis, is positively impacted by its financial performance. Companies meet stakeholders' requirements by using returns from increased financial performance, despite possible financial difficulties, to invest in sustainability operations.
→ *Negative*	(a) The financial performance (Tobin's Q) of companies is negatively impacted by its ESG activities. Companies that invest in sustainability operations dissatisfy some stakeholders, leading to poor financial performance, because of less support by stakeholders. (b) Companies' sustainability performance is adversely impacted by its financial performance. Companies that use funds available to increase its financial performance do not meet stakeholders' requirements, as little to no funds are allocated to sustainability operations.	(a) The financial performance (Tobin's Q) of companies, after a crisis, is negatively impacted by its ESG activities. Companies that might face financial difficulties, but still invest in sustainability operations, dissatisfy some stakeholders, leading to poor financial performance, because of less support by stakeholders. (b) N/A
ROE/Tobin's Q & ESG	**Stewardship theory**	
→ *Positive*	(a) N/A (b) N/A	(a) N/A (b) Companies' sustainability performance, after a crisis, is positively impacted by its financial performance. Financial performance still boosts sustainability performance. Managers and leaders (stewards) still act in the best interest of companies by using its increased financial performance to invest in ESG activities.
→ *Negative*	(a) The financial performance (Tobin's Q) of companies is negatively impacted by its ESG activities. ESG does not boost financial performance; therefore, managers and leaders (stewards) do not act in the best interest of companies if funds are invested in sustainability	(a) The financial performance (Tobin's Q) of companies, after a crisis, is negatively impacted by its ESG activities. ESG does not boost financial performance; therefore, managers and leaders (stewards) still do not act in the best interest of companies if funds are invested in sustainability operations, as it reduces financial performance.

	operations, as it reduces financial performance. (b) Companies' sustainability performance is adversely impacted by its financial performance. Financial performance does not boost sustainability performance. Managers and leaders (stewards) do not act in the best interest of companies, as all funds are allocated to increase financial performance with little to no funds allocated to ESG activities.	(b) N/A
ROE/Tobin's Q & ESG	**Signalling theory**	
→ *Positive*	(a) N/A (b) N/A	(a) N/A (b) Companies' sustainability performance, after a crisis, is positively impacted by its financial performance. Companies with good financial performance send a signal to the market that they also prioritise sustainability operations, as the excess returns from increased financial performance are used to invest in ESG activities.
→ *Negative*	(a) The financial performance (Tobin's Q) of companies is negatively impacted by its ESG activities. Companies that invest in sustainability operations send a signal to the market that too much funds are allocated to ESG activities, leading to withdrawal of support and poor financial performance. (b) Companies' sustainability performance is adversely impacted by its financial performance; companies with good financial performance send a signal to the market that financial excellence is their priority with limited devotion to investments in sustainability operations.	(a) The financial performance (Tobin's Q) of companies, after a crisis, is negatively impacted by its ESG activities. Companies that invest in sustainability operations send a signal to the market that too much funds, after a crisis, are allocated to ESG activities, leading to withdrawal of support and poor financial performance. (b) N/A
ROE/Tobin's Q & ESG	**Shareholder theory**	
→ *Positive*	(a) N/A (b) N/A	(a) N/A (b) Companies' sustainability performance, after a crisis, is positively impacted by its financial performance. Companies still meet shareholders' requirements, as returns are positive; investing in ESG activities is not at the expense of shareholders.

→ *Negative*	(a) The financial performance (Tobin's Q) of companies is negatively impacted by its ESG activities. Companies that use its funds to invest in ESG activities dissatisfy its shareholders, since shareholders' returns are negatively impacted by the decreased financial performance. (b) Companies' sustainability performance is adversely impacted by its financial performance. Companies use too much funds to increase its financial performance in order to satisfy its shareholders, with insufficient funds allocated to ESG activities.	(a) The financial performance (Tobin's Q) of companies, after a crisis, is negatively impacted by its ESG activities. Companies that use funds after a crisis to invest in ESG activities still dissatisfy their shareholders, since shareholders' returns are negatively impacted by the decreased financial performance. (b) N/A
ROE/Tobin's Q & ESG	**Resource-based theory**	
→ *Positive*	(a) N/A (b) N/A	(a) N/A (b) Companies' sustainability performance, after a crisis, is positively impacted by its financial performance. Companies with good financial performance invest funds available into sustainability operations, which are considered to be investments in valuable resources.
→ *Negative*	(a) The financial performance (Tobin's Q) of companies is negatively impacted by its ESG activities. Investments in ESG activities are not investments in valuable resources, but rather fruitless expenditure, leading to decreased financial performance. (b) Companies' sustainability performance is adversely impacted by its financial performance. Companies with good financial performance use their funds to invest in other valuable resources rather than in ESG activities.	(a) The financial performance (Tobin's Q) of companies, after a crisis, is negatively impacted by its ESG activities. Investments in ESG activities do not support companies in recovering from crises, as it is not seen as investments in valuable resources; this is fruitless expenditure and leads to decreased financial performance. (b) N/A
ROE/Tobin's Q & ESG	**Legitimacy theory**	
→ *Positive*	(a) N/A (b) N/A	(a) N/A (b) Companies' sustainability performance, after a crisis, is positively impacted by its financial performance. Companies with good financial performance satisfy the broader society by investing funds available after a crisis into sustainability operations.

→ *Negative*	(a) The financial performance (Tobin's Q) of companies is negatively impacted by its ESG activities. Investments in ESG activities are not acceptable to the broader society, leading to the withdrawal of their support and poor financial performance. (b) Companies' sustainability performance is adversely impacted by its financial performance. Companies with good financial performance do not satisfy the needs of the broader society, as they only focus on financial excellence and do not invest in sustainability operations.	(a) The financial performance (Tobin's Q) of companies, after a crisis, is negatively impacted by its ESG activities. Investments in ESG activities after a crisis are not acceptable to the broader society, leading to the withdrawal of their support and poor financial performance. (b) N/A

(Source: Researcher's own contribution, 2023)

Table 27 presents the interpretation of the relationship between financial and sustainability performance within the context of multiple theoretical frameworks. It shows that the interpretation of theories is subjective and also that the interpretations, i.e., the reasoning behind the phenomenon, differs - depending on the theory considered. Table 27 satisfies empirical objective 4.

3 SUMMARY

The aim of Chapter 5 was to present the results and findings relating to empirical objectives 1 to 4. Chapter 5 presented the interpretation of financial and sustainability data. Furthermore, Chapter 5 separately presented the eight models used to identify the relationship between financial and sustainability performance.

Empirical objective 1 was satisfied by extracting companies' ROE and Tobin's Q ratios from IRESS and interpreting the meaning behind these ratios. Empirical objective 2 was satisfied by buying companies' ESG scores from InvestVerte and interpreting the meaning of these scores. Empirical objective 3 was satisfied by conducting regression analyses to establish the relationship between financial and sustainability performance. Empirical objective 4 was satisfied by interpreting the results of the regression analyses within the context of multiple theories.

It was noted that there is an insignificant relationship between ROE and ESG; therefore only the models including Tobin's Q as a measure of financial performance were used to select the models to be used in interpreting (a)'s results within the context of multiple theories. For (a), Model 3 was selected and for (b), Model 5 was selected. It was also noted that sustainability performance had a negative impact on financial performance before and after COVID-19. Financial performance negatively impacted sustainability performance before COVID-19; however, after-COVID-19, financial performance positively impacted sustainability performance. Furthermore, it was noted that the interpretation of the relationship between financial and sustainability performance differs when considered from different theoretical perspectives.

Chapter 6 discusses the theoretical objectives and its findings and will conclude this study.

CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS

1 INTRODUCTION

Chapter 5 presented this study's empirical results and linked empirical objectives 1 to 4 to its findings. The aim of Chapter 6 is to address the theoretical objectives as well as the primary objective. Chapter 6 also concludes on the present study and makes suggestions for future studies. Chapter 6 provides a high-level overview of the study, a summary of the chapters, a summary of findings, conclusions made, an assessment of the study and lastly, after considering this study, recommendations for future research studies.

2 HIGH LEVEL OVERVIEW

As various research studies use theoretical frameworks arbitrarily and do no revisit the theory chosen, this study was primarily focused on considering the impact that different theoretical frameworks have on a specific scenario. The scenario considered was the relationship between financial and sustainability performance. Since it is a South African study, the performance of JSE listed companies was evaluated. Furthermore, this relationship was analysed before and after a crisis-time to determine whether a crisis impacted this relationship. The COVID-19 pandemic was identified as a crisis-time and companies that traded in the industries that were severely affected by the pandemic, were included in this study. After the relationship between these companies' financial and sustainability performance was determined, the results were interpreted within the context of multiple theoretical frameworks.

3 SUMMARY OF CHAPTERS

Chapter 1 introduced this study. It provided the background to this study, i.e., the COVID-19 crisis in South Africa, financial performance, sustainability performance, and most importantly the use of theoretical frameworks for interpreting results. A summary of the literature review conducted was given, followed by the problem statement and the development of research objectives. A schematic diagram was presented to illustrate the interrelationship between the variables included in this study. Topic actuality, a summary of the research design and methodology followed, and ethical considerations were also considered in Chapter 1. Chapter 1 concluded with a high-level overview of all the chapters included in this study.

Chapter 2 presented the first literature review conducted, i.e., the importance and interpretation of multiple theoretical frameworks. The theories used in prior research studies that examined the relationship between financial and sustainability performance were considered. It was concluded that stakeholder-, stewardship-, signalling-, shareholder-, resource-based- and legitimacy theory were the main theories to be used; subsequently, a detailed discussion on each of these theories followed.

Chapter 3 continued the literature review wherein financial performance, sustainability performance and the COVID-19 pandemic were discussed. The measurement of financial performance in terms of ROE/Tobin's Q, multiple possible measurements of sustainability performance and the impact of COVID-19 on companies were considered. This was followed by a discussion on the relationship between financial and sustainability performance.

Chapter 4 presented the research design and methodology adopted in this study. Firstly, the purpose and characteristics of research was detailed, whereafter the research process was described by making use of the research onion. A comprehensive description of the data used in this study was given, i.e., data collection, criteria for inclusion, variables included in the study, descriptive statistics and the models developed. Chapter 4 concluded with a framework to be used to interpret results within the context of multiple theoretical frameworks.

Chapter 5 presented this study's results and findings, specifically those relating to empirical objectives 1 to 4. Empirical objectives 1 to 4, identified in Chapter 1, was linked to its findings. Each model's assumptions, results and interpretation were separately presented after which two models were selected for interpretation within the context of multiple theoretical frameworks.

Chapter 6 concludes this study. Here, an overview of the study, a summary of each chapter in the study, a summary of findings, final conclusions and recommendations are given. Chapter 6 links the theoretical objectives to its finding and addresses the primary objectives. Chapter 6 also presents a derived interpretation of the relationship between financial and sustainability performance before and after COVID-19 within the context of stakeholder-, stewardship-, signalling-, shareholder-, resource-based- and legitimacy theory.

4 SUMMARY OF FINDINGS

Discussions on the findings from the literature review and empirical study follow below.

4.1 Theoretical objectives

This study comprised four theoretical objectives. To reach these objectives, literature reviews were conducted. The theoretical objectives have been satisfied in Chapter 2 and Chapter 3, where detailed discussions on the literature reviews were presented. The literature review revealed that theoretical frameworks are frequently neglected in research papers. Prior studies that examined the relationship between companies' financial and sustainability performance had inconclusive results; furthermore, there were limited cases where this relationship was studied before and after a crisis-period (COVID-19) and none such cases were executed within a South African context.

Brief discussions, linking each theoretical objective to its finding, are presented below:

4.1.1 Theoretical objective 1

Theoretical objective 1 was stated as follows:

To consider multiple theories that are used to explain phenomena and the importance and interpretation thereof.

Theoretical frameworks are important in any research study as they provide structure and guidance. Moreover, theories provide a specific perspective from which a certain situation can be considered. Literature revealed five theoretical frameworks that were previously considered in studies that also investigated the relationship between sustainability and financial performance, namely, stakeholder-, stewardship-, signalling-, shareholder-, resource-based- and legitimacy theory.

Stakeholder theory states that companies must create value for all its stakeholders and not only focus on shareholders' requirements. Stewardship theory states that stewards, such as managers and leaders, must act in the best interest of a company to ensure good company performance. Signalling theory states that the actions of companies send signals to stakeholders regarding the companies' performance. Shareholder theory states that companies' goals must be to satisfy shareholders by increasing their returns. Resource-based theory states that good company performance is associated with the employment of valuable resources. Legitimacy theory states that companies excel once the broader society approve their actions.

4.1.2 Theoretical objective 2

Theoretical objective 2 was stated as follows:

To investigate the use of financial ratio analyses (specifically ROE and Tobin's Q) to evaluate financial performance and how these ratios are interpreted.

Financial ratios provide an indication of companies' performance, especially if it is compared to prior years' financial ratios and/or the industry norm. Financial ratios also assist management in identifying problem areas and/or areas where improvement is required.

ROE, an accounting-based measure of financial performance, is an important measure of companies' financial performance, as it incorporates different classes of ratios (each impacted by different business aspects) into a single ratio – this is evident in the Du Pont model. ROE measures how successful companies are in generating profits from shareholders' funds. ROE is calculated as follows:

$$ROE = \frac{Net\ profit}{Ordinary\ equity}$$

A high ROE indicates a profitable company, as it shows the effective and efficient employment of funds – this leads to increased returns in the form of increased profits.

Tobin's Q, a market-based measure of financial performance, measures a company's financial performance from the market's perspective, i.e., the investment-value of the company. This ratio incorporates the value of companies' shares (market value) and its replacement value. Tobin's Q is calculated as follows:

$$Tobin's\ Q = \frac{Market\ value}{Total\ asset\ value}$$

A high Tobin's Q indicates that the company is highly valued by the market – they consider the company to have great future growth value and is therefore inclined to invest in such a company.

4.1.3 Theoretical objective 3

Theoretical objective 3 was stated as follows:

To evaluate the importance of sustainability performance and how it is measured in terms of ESG scores.

Sustainability performance reflects companies' contribution to maintaining a good environmental, social and governance environment. Sustainability performance is just as important as financial performance, as stakeholders are more likely to support companies that implement sustainability operations.

Sustainability performance can be measured by making use of ESG scores whereby a company's environmental (E), social (S) and governance (G) activities are evaluated. Companies are given an overall ESG score as well as individual scores per ESG pillar. ESG scores are compiled by ESG rating providers and are thus subjective views of the effectiveness of companies' investments in sustainability operations.

4.1.4 Theoretical objective 4

Theoretical objective 4 was stated as follows:

To review existing literature to determine the impact of COVID-19 on the financial performance of JSE listed companies and what the findings were.

COVID-19 had an immense impact on companies' performance since companies had to scale down their operations, leading to loss of revenue and subsequent poor financial performance. In a South African context, the JSE listed companies in the Basic Materials, Industrials, Consumer Goods, Consumer Services and Telecommunication industries were those severely impacted by COVID-19.

Literature revealed that companies that prioritised ESG activities, i.e., investing in sustainability operations, were more resilient to the impact of COVID-19 on its financial performance. Even though these companies' financial performance declined during the pandemic, it did not deteriorate as much as expected, as an increase in sustainability activities often results in an increase in financial performance as well. Good sustainability performance thus provides some sort of immunity to companies during a crisis-time.

4.2 Empirical objectives

This study comprised four empirical objectives. The empirical study conducted, as it pertains to empirical objective 1 to 4, was discussed in detail in Chapter 4 as well as in Chapter 5, where each empirical objective was linked to its finding.

4.3 Primary objective

The primary objective was stated as follows:

The primary objective of the study is to consider the interpretation of multiple theories (six selected theories) on a specific scenario, i.e., the relationship between JSE listed companies' financial performance (in terms of financial ratios) and sustainability performance (in terms of ESG) before and after the COVID-19 pandemic.

The primary objective was satisfied in Table 27 (see *section 2.1.4.* of *Chapter 5*). The same results, i.e., the relationship between financial and sustainability performance before and after COVID-19, were differently interpreted, depending on the theoretical framework from which it was considered. It was noted that some theories interpreted a relationship as positive, e.g., investments in ESG activities are investments in valuable resources (resource-based theory), whereas another theory interpreted the same relationship as negative, e.g., investments in ESG activities dissatisfy shareholders as their returns are not maximised (shareholder theory). It is thus evident that it is important to consider from which theoretical perspective a scenario is considered before interpreting the results.

4.4 Derived interpretation

Table 27 presented this study's results within the context of multiple theories; however, for completion and to further demonstrate how interpretation differs between theories, Table 28 presents a comprehensive interpretation derived from the study's results, i.e., positive and negative relationships are interpreted within the context of all six identified theories. The interpretations are based on the core principle of each theory:

Stakeholder theory

Companies must not only create value for its shareholders, but for all its stakeholders.

Stewardship theory

Managers and leaders, when given a decision, will serve the company without considering any possible self-interests.

Signalling theory

Companies' actions signal to the market information about their performance.

Shareholder theory

Companies must maximise profits to increase the returns that shareholders, the ultimate owners of companies, receive.

Resource-based theory

Valuable resources provide companies with a competitive advantage in the market.

Legitimacy theory

Companies structure their actions in such a way that it is acceptable for the broader society.

Note that a positive relationship indicates that the two variables (FP and SP) move in the same direction, whereas a negative relationship indicates a movement in opposite directions. Therefore, a vice versa interpretation is valid in all the cases below.

Table 28: Comprehensive interpretation within the context of multiple theoretical frameworks

Relationship between:	**Before COVID-19 (No crisis)**	**After COVID-19 (No crisis/Recovering from a crisis)**
ROE/Tobin's Q & ESG	**Stakeholder theory**	
→ *Positive*	(a) The financial performance of companies is positively impacted by its ESG activities. Stakeholders expect companies to contribute to sustainability; therefore, when companies invest in sustainability operations, they satisfy stakeholders' requirements, leading to more support and increased financial performance. (b) Companies' sustainability performance is positively impacted by its financial performance. Companies meet stakeholders' requirements by using their increased financial performance to invest in sustainability operations.	(c) The financial performance of companies, after a crisis, is positively impacted by its ESG activities. Stakeholders still expect companies to contribute to sustainability, despite possible financial difficulties; therefore, when companies invest in sustainability operations, they satisfy stakeholders' requirements, leading to more support and increased financial performance. (d) Companies' sustainability performance, after a crisis, is positively impacted by its financial performance. Companies meet stakeholders' requirements by using returns from increased financial performance, despite possible financial difficulties, to invest in sustainability operations.
→ *Negative*	(c) The financial performance of companies is negatively impacted by its ESG activities. Companies that invest in sustainability operations dissatisfy some stakeholders, leading to poor financial performance, because of less support by stakeholders. (d) Companies' sustainability performance is adversely impacted by its financial performance. Companies that use funds available to increase its financial performance do not meet stakeholders' requirements, as little to no funds are allocated to sustainability operations.	(c) The financial performance of companies, after a crisis, is negatively impacted by its ESG activities. Companies that might face financial difficulties, but still invest in sustainability operations, dissatisfy some stakeholders, leading to poor financial performance, because of less support by stakeholders. (d) Companies' sustainability performance, after a crisis, is adversely impacted by its financial performance. Companies that use funds available to increase its financial performance do not meet stakeholders' requirements, as little to no funds are allocated to sustainability operations.
ROE/Tobin's Q & ESG	**Stewardship theory**	
→ *Positive*	(a) The financial performance of companies is positively impacted by its ESG activities. ESG boosts financial performance; therefore, managers and leaders (stewards) act in the best interest of companies by investing in sustainability operations.	(c) The financial performance of companies, after a crisis, is positively impacted by its ESG activities. ESG still boosts financial performance; therefore, managers and leaders (stewards) still act in the best interest of companies by investing in sustainability operations.

	(b) Companies' sustainability performance is positively impacted by its financial performance. Financial performance boosts sustainability performance. Managers and leaders (stewards) act in the best interest of companies by using its increased financial performance to invest in ESG activities.	(d) Companies' sustainability performance, after a crisis, is positively impacted by its financial performance. Financial performance still boosts sustainability performance. Managers and leaders (stewards) still act in the best interest of companies by using its increased financial performance to invest in ESG activities.
→ *Negative*	(c) The financial performance of companies is negatively impacted by its ESG activities. ESG does not boost financial performance; therefore, managers and leaders (stewards) do not act in the best interest of companies if funds are invested in sustainability operations, as it reduces financial performance. (d) Companies' sustainability performance is adversely impacted by its financial performance. Financial performance does not boost sustainability performance. Managers and leaders (stewards) do not act in the best interest of companies, as all funds are allocated to increase financial performance with little to no funds allocated to ESG activities.	(c) The financial performance of companies, after a crisis, is negatively impacted by its ESG activities. ESG does not boost financial performance; therefore, managers and leaders (stewards) still do not act in the best interest of companies if funds are invested in sustainability operations, as it reduces financial performance. (d) Companies' sustainability performance, after a crisis, is adversely impacted by its financial performance. Financial performance does not boost sustainability performance. Managers and leaders (stewards) still do not act in the best interest of companies, as all funds are allocated to increase financial performance with little to no funds allocated to ESG activities.
ROE/Tobin's Q & ESG	**Signalling theory**	
→ *Positive*	(a) The financial performance of companies is positively impacted by its ESG activities. By investing in ESG activities, companies send a signal to the market about the effectiveness of the company's operations and their devotion to investing in sustainable operations; resulting in more support and increased financial performance. (b) Companies' sustainability performance is positively impacted by its financial performance. Companies with good financial performance send a signal to the market that they also prioritise sustainability operations and allocate funds to ESG activities.	(c) The financial performance of companies, after a crisis, is positively impacted by its ESG activities. By investing in ESG activities, companies send a signal to the market about their recovery from the crisis, the effectiveness of the company's operations and their devotion to investing in sustainable operations; resulting in more support and increased financial performance. (d) Companies' sustainability performance, after a crisis, is positively impacted by its financial performance. Companies with good financial performance send a signal to the market that they also prioritise sustainability operations, as the excess returns from increased financial performance are used to invest in ESG activities.
→ *Negative*	(c) The financial performance of companies is negatively impacted by its ESG activities. Companies that invest in	(c) The financial performance of companies, after a crisis, is negatively impacted by its ESG activities. Companies that invest in

	sustainability operations send a signal to the market that too much funds are allocated to ESG activities, leading to withdrawal of support and poor financial performance. (d) Companies' sustainability performance is adversely impacted by its financial performance; companies with good financial performance send a signal to the market that financial excellence is their priority with limited devotion to investments in sustainability operations.	sustainability operations send a signal to the market that too much funds, after a crisis, are allocated to ESG activities, leading to withdrawal of support and poor financial performance. (d) Companies' sustainability performance after a crisis is adversely impacted by its financial performance; companies with good financial performance send a signal to the market that they still prioritise financial excellence with limited devotion to investments in sustainability operations.
ROE/Tobin's Q & ESG	**Shareholder theory**	
→ *Positive*	(a) The financial performance of companies is positively impacted by its ESG activities. Shareholders are satisfied as their returns are improving because of the positive impact of ESG activities on financial performance. (b) Companies' sustainability performance is positively impacted by its financial performance. Companies meet shareholders' requirements as returns are positive; investing in ESG activities is not at the expense of shareholders.	(c) The financial performance of companies, after a crisis, is positively impacted by its ESG activities. Shareholders are satisfied as their returns are improving because of the positive impact of ESG activities on financial performance, despite companies experiencing some financial difficulties. (d) Companies' sustainability performance, after a crisis, is positively impacted by its financial performance. Companies still meet shareholders' requirements, as returns are positive; investing in ESG activities is not at the expense of shareholders.
→ *Negative*	(c) The financial performance of companies is negatively impacted by its ESG activities. Companies that use its funds to invest in ESG activities dissatisfy its shareholders, since shareholders' returns are negatively impacted by the decreased financial performance. (d) Companies' sustainability performance is adversely impacted by its financial performance. Companies use too much funds to increase its financial performance in order to satisfy its shareholders, with insufficient funds allocated to ESG activities.	(c) The financial performance of companies, after a crisis, is negatively impacted by its ESG activities. Companies that use funds after a crisis to invest in ESG activities still dissatisfy their shareholders, since shareholders' returns are negatively impacted by the decreased financial performance. (d) Companies' sustainability performance, after a crisis, is adversely impacted by its financial performance. Companies use too much funds after a crisis to increase its financial performance in order to satisfy its shareholders, with insufficient funds allocated to ESG activities.
ROE/Tobin's Q & ESG	**Resource-based theory**	
→ *Positive*	(a) The financial performance of companies is positively impacted by its ESG activities. Investment in ESG activities are investments in valuable	(c) The financial performance of companies, after a crisis, is positively impacted by its ESG activities. Investment in ESG activities support companies in

	resources, which gives companies a competitive advantage and increases financial performance. (b) Companies' sustainability performance is positively impacted by its financial performance. Companies with good financial performance invest their funds in sustainability operations, which are considered to be investments in valuable resources.	recovering from a crisis, as it is seen as investments in valuable resources; this gives companies a competitive advantage after a crisis and increases financial performance. (d) Companies' sustainability performance, after a crisis, is positively impacted by its financial performance. Companies with good financial performance invest funds available into sustainability operations, which are considered to be investments in valuable resources.
→ *Negative*	(c) The financial performance of companies is negatively impacted by its ESG activities. Investments in ESG activities are not investments in valuable resources, but rather fruitless expenditure, leading to decreased financial performance. (d) Companies' sustainability performance is adversely impacted by its financial performance. Companies with good financial performance use their funds to invest in other valuable resources rather than in ESG activities.	(c) The financial performance of companies, after a crisis, is negatively impacted by its ESG activities. Investments in ESG activities do not support companies in recovering from crises, as it is not seen as investments in valuable resources; this is fruitless expenditure and leads to decreased financial performance. (d) Companies' sustainability performance, after a crisis, is adversely impacted by its financial performance. Companies with good financial performance use funds available to invest in other valuable resources rather than in ESG activities.
ROE/Tobin's Q & ESG	**Legitimacy theory**	
→ *Positive*	(a) The financial performance of companies is positively impacted by its ESG activities. The broader society expects companies to invest in sustainability operations; therefore, if companies invest in ESG activities, they satisfy the society, leading to an increase in the support they receive and increased financial performance. (b) Companies' sustainability performance is positively impacted by its financial performance. Companies with good financial performance satisfy the broader society by investing funds in sustainability operations.	(c) The financial performance of companies, after a crisis, is positively impacted by its ESG activities. The broader society still expects companies to invest in sustainability operations; therefore, if companies use funds available to them after a crisis to invest in ESG activities, they satisfy the society; this leads to an increase in the support they receive and an increase in financial performance. (d) Companies' sustainability performance, after a crisis, is positively impacted by its financial performance. Companies with good financial performance satisfy the broader society by investing funds available after a crisis into sustainability operations.
→ *Negative*	(c) The financial performance of companies is negatively impacted by its ESG activities. Investments in ESG activities are not acceptable to the broader society, leading to the	(c) The financial performance of companies, after a crisis, is negatively impacted by its ESG activities. Investments in ESG activities after a crisis are not acceptable to the broader society, leading to the withdrawal of their

	withdrawal of their support and poor financial performance. (d) Companies' sustainability performance is adversely impacted by its financial performance. Companies with good financial performance do not satisfy the needs of the broader society, as they only focus on financial excellence and do not invest in sustainability operations.	support and poor financial performance. (d) Companies' sustainability performance, after a crisis, is adversely impacted by its financial performance. Companies with good financial performance do not satisfy the needs of the broader society, as they only focus on redeeming their financial performance and do not invest in sustainability operations.

(Source: Researcher's own contribution, 2023)

5 CONCLUSIONS

Chapter 5 separately presented empirical objectives 1 to 4, together with its findings. The conclusions reached are as follows:

In Chapter 5, by making use of a linear mixed effect regression analysis, it was noted that there was no significant relationship between ROE, an accounting-based measure of financial performance, and ESG, a measure of sustainability performance. However, there was a significant relationship between Tobin's Q, a market-based measure of financial performance, and ESG. Therefore, this relationship was considered before and after COVID-19. From Chapter 5, it can be concluded that sustainability performance (ESG) had a negative impact on companies' financial performance (Tobin's Q) before and after COVID-19; therefore, no difference between a period before a crisis and after a crisis. From Chapter 5, it can also be concluded that financial performance (Tobin's Q) had a negative impact on companies' sustainability performance (ESG) before COVID-19; however, financial performance (Tobin's Q) had a positive impact on companies' sustainability performance (ESG) after COVID-19. The impact of ESG on Tobin's Q thus differs between a period before a crisis and after a crisis. Furthermore, the abovementioned results were interpreted within stakeholder-, stewardship-, signalling-, shareholder-, resource-based- and legitimacy theory (see *Table 27*), which revealed different interpretations of the same results.

In Chapter 6, for completion, a comprehensive interpretation - derived from this study's results - was presented in Table 28. It became apparent that interpretation is subjective and that the same results can be interpreted as positive or negative, depending on the theory used.

6 ASSESSMENT OF THE STUDY

After the study was conducted, it was assessed as follows:

6.1 Contribution to the theory

This study revealed that theories are applicable before and after a crisis-time; therefore, there is no need to adjust a theory depending on external situations. However, some theories might be more appropriate than others in a period after a crisis; for example (refer to *Table 27*), shareholder theory argues that financial performance has a positive impact on sustainability performance after a crisis, since excess funds are invested in sustainability operations. However, as companies are likely to struggle financially just after a crisis, shareholders will require the distribution of any excess funds; therefore, using shareholder theory in explaining this phenomenon is not the most appropriate theory to use. Here, resource-based theory is more appropriate, stating that companies that use excess funds to invest in sustainability operations do in fact invest in valuable resources that can provide them with a competitive advantage.

6.2 Practical value

The empirical study revealed that there is not a significant relationship between ROE and ESG – this indicates that, for companies to increase their financial performance (ROE), other factors (beside ESG) must be considered. As sustainability performance had a negative impact on financial performance before and after COVID-19, it indicates that there is no need for companies to develop an ESG framework (aimed at sustaining financial performance) to be used in future crisis periods. However, after a crisis, financial performance is positively associated with sustainability performance, and therefore it is important for companies to invest in sustainability operations after a crisis-time.

Theoretical frameworks are key elements of research papers. This study revealed the importance of interpreting results within the context of a theory, as the interpretation of results differs between different theories. This study's results can be used by academics to select the most appropriate theory for a research paper and to motivate the reasoning behind using that theory, as this study indicated how the interpretation between theories differs.

6.3 Sustainable development goals

This study revealed that financial performance is negatively impacted by sustainability performance, both before and after a crisis-time – thereby discouraging companies to invest in sustainable operations and not meeting their SDG targets. However, as sustainability performance is positively impacted by financial performance after a crisis-time, is shows the importance of sustainability and thereby motivates companies to meet their SDG targets.

6.4 Originality

This study differed from previous related studies as it examined the relationship between financial and sustainability performance before and after a crisis-time, where other studies did not consider different periods. This study also interpreted the results within the context of multiple theories, where other studies only mentioned one or two studies without specifically using the theories to interpret results.

6.5 Reliability and validity

This study is reliable as financial data was extracted from IRESS, a well-known database, and sustainability data was bought from InvestVerte, a known ESG-rating provider. Furthermore, a reliable method, a linear mixed effect model, was used to perform regression analyses. This indicates that the results (relationship between financial and sustainability performance) obtained from this study are accurate, thereby confirming the validity of the study.

6.6 Credibility and trustworthiness

The credibility of this study is confirmed by the interpretation of results from various perspectives (theories). Furthermore, as the entire research process was clearly documented, supervised and evidence provided, the trustworthiness of the study is confirmed.

6.7 Limitations

The study had the following limitations:

- ESG data was bought, therefore only companies for which ESG scores were available were included, i.e., a convenience sample was used.
- Some companies' financial ratios were incomplete and were excluded from the sample.
- Only six theoretical frameworks, based on prior studies, were considered; however, the interpretation of results might have differed if other theories had also been considered.

7 RECOMMENDATIONS

After consideration of this study and its findings, the following suggestions for future research studies are made:

As this study focused on the relationship between JSE listed companies' financial and sustainability performance before and after COVID-19, i.e., in a South African context, future studies can expand on this by also including companies outside of South Africa and/or considering other industries than those included in this study.

This study found that companies, on average, performed better with regard to the social pillar of ESG and that the environmental pillar of ESG was neglected. The governance pillar and the overall ESG performance of companies, on average, were mediocre. Future studies can investigate the reasoning behind this, i.e., what contributes and/or halts companies' sustainability performance.

This study made use of ROE and Tobin's Q as measures of financial performance; other measures, such as ROA (which was primarily used in other studies) can also be considered to establish the relationship before and after a crisis-time, like COVID-19 or similar.

As there might still be companies recovering from COVID-19, it could be beneficial to reperform a similar study in future when there are no longer signs of the pandemic and when companies are expected to be fully recovered from COVID-19's impact.

A final recommendation for future studies is to not only mention a theory, but to interpret the study's findings within the context of the chosen theory and to revisit the theory once results had been obtained and explained.

8 FINAL CONCLUSION

The primary objective, being the interpretation of multiple theories on the relationship between JSE listed companies' performance (in terms of financial ratios) and sustainability performance (in terms of ESG) before and after the COVID-19 pandemic, was reached. It became evident that theoretical frameworks are crucial to any research paper; not only does it provide clarity on a scenario, but it also guides one in interpreting results. This is confirmed by Kessler (2013)'s statement, as was stated in the introduction to this study:

"Educators often superficially toss out the name of a theorist or make a sideways reference to a specific theory and move on, as if assuming their audience possesses the necessary familiarity to appreciate, evaluate, integrate, and appropriately apply its insights for improving their particular set of circumstances" – (Kessler, 2013).

REFERENCES

Abeysekera, I. 2012. A template for integrated reporting. *Journal of Intellectual Capital*, 14(2):277-245. https://doi./10.1108/14691931311323869

Acharya, A.S., Prakash, A., Saxena, P. & Nigam, A. 2013. Sampling: Why and How of it? *Indian Journal of Medical Specialities*, 4(2):330-333.

Achim, M., Safta, I.L., Vãidean, V.L., Mureşan, G.M. & Borlea, N.S. 2021. The impact of covid-19 on financial management: evidence from Romania. E*conomic Research-Ekonomska Istraživanja*, 35(1):1807-1832. https://doi./10.1108/14691931311323869

Aggarwal, P. 2013. Impact of Sustainability Performance of Company on its Financial Performance: A Study of Listed Indian Companies [Abstract]. *Global Journal of Management and Business Research (C: Finance)*, 13(11):1-11. https://ssrn.com/abstract=3131923

Ahmad, N., Mobarek, A., Roni, N.N. & Tan, A.W.K. 2021. Revisiting the impact of ESG on financial performance of FTSE350 UK firms: Static and dynamic panel data analysis. *Cogent Business & Management*, 8(1):1-18. https://doi.org/10.1080/23311975.2021.1900500

Alcántara-Ayala, I. 2002. Geomorphology, natural hazards, vulnerability and prevention of natural disasters in developing countries. *Geomorphology*, 47(2-4):107-124. https://doi.org/10.1016/S0169-555X(02)00083-1

Aldasoro, I., Frost, J., Gambacorta, L. & Whyte, D. 2021. Covid-19 and cyber risk in the financial sector. *BIS Bulletins,* 37:1-9. https://www.bis.org/publ/bisbull37.pdfAlharahsheh, H.H. & Pius, A. 2020. A Review of key paradigms: positivism VS interpretivism. *Global Academic Journal of Humanities and Social Sciences*, 2(3): 93-43.

Alhaddi, H. 2015. Triple bottom line and sustainability: A literature review. *Business and Management studies*, 1(2):6-10. https://doi.org/10.11114/bms.v1i2.752

Alharahsheh, H.H. and Pius, A. 2020. A review of key paradigms: Positivism VS interpretivism. *Global Academic Journal of Humanities and Social Sciences,* 2(3):39-43. https://gajrc.com/media/articles/GAJHSS_23_39-43_VMGJbOK.pdf

Alin, A. 2010. Multicollinearity*. Wiley interdisciplinary reviews: computational statistics*, 2(3):370-374. https://doi.org/10.1002/wics.84

Almagtome, A. & Abbas, Z. 2020. Value relevance of financial performance measures: An empirical study. *International Journal of Psychological Rehabilitation*, 24(7):6777-6791.

https://scholar.googleusercontent.com/scholar?q=cache:hmQ8NQISdeQJ:scholar.google.com/+importance+of+financial+performance+measures&hl=en&as_sdt=0,5&as_ylo=2019&inst=12172072488891418045

Almatrooshi, F., Alhammadi, S., Salloum, S.A. & Shalaan, K. 2022. [Abstract]. *Case Study: The Implications of Knowledge Management Tools on the Process of Overcoming COVID-19.* Paper delivered at Proceedings of International Conference on Emerging Technologies and Intelligent Systems, Springs, Cham. https://doi.org/10.1007/978-3-030-85990-9_49

Almeida, F., Santos, D. & Augusto Monteiro, J., 2020. The Challenges and Opportunities in the Digitalization of Companies in a Post-COVID-19 World. *IEEE Engineering Management Review*, 48(3):97-103. https://doi.org/10.1109/EMR.2020.3013206

Alsamhi, M.H., Al-Ofair, F.A., Farhan, N.H.S., Al-ahdal, W.M. & Siddiqui, A. 2022. Impact of Covid-19 on firms' performance: Empirical evidence from India. *Cogent Business & Management*, 9(1):1-16. https://doi.org/10.1080/23311975.2022.2044593

Alshehhi, A., Nobanee, H. & Khare, N. 2018. The Impact of Sustainability Practices on Corporate Financial Performance: Literature Trends and Future Research Potential. *Sustainability*, (10)2:494. https://doi.org/10.3390/su10020494

Alturki, R. 2021. Research onion for smart IoT-enabled mobile applications. *Scientific Programming,* 2021:1-9. https://doi.org/10.1155/2021/4270998

Alvarez, S. & Sachs, S. 2021. Where do stakeholders come from? [Abstract] *Academy of Management Review*. https://doi.org/10.5465/amr.2019.0077

Amel-Zadeh, A. & Serafeim, G. 2018. Why and How Investors Use ESG Information: Evidence from a Global Survey. *Financial Analysts Journal*, 74(3):87-103. https://doi.org/10.2469/faj.v74.n3.2

Arvidsson, S. & Dumay, J. 2021. Corporate ESG reporting quantity, quality and performance: Where to now for environmental policy and practice? *Business Strategy and the Environment*, 31(3):1091-1110. https://doi.org/10.1002/bse.2937

Aryani, Y.A. & Setiawan, D. 2020. Balanced scorecard: Is it beneficial enough? A literature review. *Asian Journal of Accounting Perspectives*, 13(1):65-84. https://doi.org/10.22452/AJAP.vol13no1.4

Assous, H.F. 2022. Saudi Green Banks and Stock Return Volatility: GLE Algorithm and Neural Network Models. *Economies*, 10(10):242. https://doi.org/10.3390/economies10100242

Bahari, S.T. 2010. Qualitative versus quantitative research strategies: Contrasting epistemological and ontological assumptions. *Sains Humanika*, 52(1):17-28. https://sainshumanika.utm.my/index.php/sainshumanika/article/view/256/253

Bakdash, J.Z. & Marusich, L.R. 2023. *rmcorr: repeated measures correlation* (R package version 0.6.0). https://CRAN.R-project.org/package=rmcorr Date of access: 11 Oct. 2023.

Barney, J. 1991. Firm resources and sustained competitive advantage [Abstract]. *Journal of management*, 17(1):99-120. https://doi.org/10.1177/014920639101700108

Basias, N. & Pollalis, Y. 2018. Quantitative and qualitative research in business & technology: Justifying a suitable research methodology. *Review of Integrative Business and Economics Research*, 7:91-105. https://sibresearch.org/uploads/3/4/0/9/34097180/riber_7-s1_sp_h17-083_91-105.pdf

Batchimeg, B. 2017. Financial performance determinants of organizations: The case of Mongolian companies. *Journal of competitiveness*, 9(3):22-33. https://pdfs.semanticscholar.org/33c2/638bc774f1c214f405f8ef8bd62f9b297476.pdf

Bates, D., Maechler, M., Bolker, B. & Walker, S. 2015. Fitting Linear Mixed-Effects Models Using lme4. *Journal of Statistical Software*, 67(1):1-48. https://doi.org/10.18637/jss.v067.i01

Beloskar, V.D. & Rao, S.V.D.N. 2022. Did ESG Save the Day? Evidence From India During the COVID-19 Crisis. *Asia-Pac Financ Markets*, 30:73-107. https://doi.org/10.1007/s10690-022-09369-5

Benson, A.K. & Fortune, G. 2022. Sensitivity analysis of the impact of Covid-19 on corporate sustainability and company performance: Recovery strategy for companies and nations around the world. *International Journal of Research in Business and Social Science,* 11(3):16-26. https://doi.org/10.20525/ijrbs.v11i3.1704

Bento, R.F., Mertins, L. & White, L.F. 2019. Do Sustainability Measures Matter in Managerial Appraisal and Rewards? In: Lehman, C.R., eds. *Beyond Perceptions, Crafting Meaning (Advances in Public Interest Accounting, Vol. 21).* Bingley: Emerald Publishing Limited. pp. 1-24. https://doi.org/10.1108/S1041-706020190000021001

Bergh, D.D., Connelly, B.L., Ketchen, D.J. & Shannon, L.M. Signalling Theory and Equilibrium in Strategic Management Research: An Assessment and a Research Agenda. *Journal of Management Studies,* 51(8): 1134-1360. https://doi.org/10.1111/joms.12097

Bissoondoyal-Bheenick, E., Brooks, R. & Do, H.X. 2023. ESG and firm performance: The role of size and media channels. *Economic Modelling,* 121:106203. https://doi.org/10.1016/j.econmod.2023.106203

Bolinger, M. T., Josefy, M. A., Stevenson, R., & Hitt, M. A. 2022. Experiments in Strategy Research: A Critical Review and Future Research Opportunities. *Journal of Management*, 48(1): 77–113. https://doi.org/10.1177/01492063211044416

Broadstock, D.C., Chan, K., Cheng, L.T.W. & Wang, X. 2021. The role of ESG performance during times of financial crisis: Evidence from COVID-19 in China. *Finance Research Letters*, 38:101716. https://doi.org/10.1016/j.frl.2020.101716

Bulled, N. & Singer, M. 2020. In the shadow of HIV & TB: A commentary on the COVID epidemic in South Africa. *Global Public Health*, 15(8):1231-1243. https://doi.org/10.1080/17441692.2020.1775275

Caballero-Morales, S. 2021. Innovation as recovery strategy for SMEs in emerging economies during the COVID-19 pandemic. *Research in International Business and Finance*, 57:101396. https://doi.org/10.1016/j.ribaf.2021.101396

Carnini Pulino, S., Ciaburri, M., Magnanelli, B.S. & Nasta, L. 2022. Does ESG disclosure influence firm performance? *Sustainability*, 14(13):7595. https://doi.org/10.3390/su14137595

Chen, C.D., Su, C.J. & Chen, M. 2022. Are ESG-committed hotels financially resilient to the COVID-19 pandemic? An autoregressive jump intensity trend model. *Tourism Management*, 93:104581. https://doi.org/10.1016/j.tourman.2022.104581

Chen, Z. & Xie, G. 2022. ESG disclosure and financial performance: Moderating role of ESG investors. *International Review of Financial Analysis*, 83:102291. https://doi.org/10.1016/j.irfa.2022.102291

Cho, B. & Saki, Z. 2021. Firm performance under the COVID-19 pandemic: The case of the U.S. textile and apparel industry. *The Journal of The Textile Institute*, 113(8):1637-1647. https://doi.org/10.1080/00405000.2021.1943258

Chowdhury, M.T., Sarkar, A., Paul, S.K. & Moktadir, M.A. 2022. A case study on strategies to deal with the impacts of COVID-19 pandemic in the food and beverage industry. *Operational Management Research*, 15:166-178. https://doi.org/10.1007/s12063-020-00166-9

Ciotti, M., Ciccozzi, M., Terrinoni, A., Jiang, W., Wang, C. & Bernardini, S. 2020. The COVID-19 pandemic [Abstract]. *Critical Reviews in Clinical Laboratory Sciences*, 57(6):365-388. https://doi.org/10.1080/10408363.2020.1783198

Clarke, C. & Friedman, H.H. 2016. 'Maximizing Shareholder Value': A Theory Run Amok. *Clarke, Clifton & Friedman, HH (2016). Maximizing shareholder value: A theory run amok. i-manager's Journal on Management*, 10(4):45-60. https://ssrn.com/abstract=2796836

Clément, A., Robinot, E. & Trespeuch, L. 2022. Improving ESG Scores with Sustainability Concepts. *Sustainability,* 14(20):13154. https://doi.org/10.3390/su142013154

Connelly, L.M. 2014. Use of theoretical frameworks in research. *Medsurg Nursing*, 23(3):187. https://www.proquest.com/openview/da93a1fb535375f29c35c30b42d17454/1?pq-origsite=gscholar&cbl=30764

Correia, C. 2019. *Financial Management*. 9th ed. Cape Town: Juta. pp. 5-15.

Coryn, C.L. 2006. The fundamental characteristics of research. *Journal of Multidisciplinary Evaluation*, 3(5):124-133.

Cuong Pham, D., Anh Do, T.N., Nga Doan, T., Hong Nguyen, T.X. & Yen Pham, T.K. 2021. The impact of sustainability practices on financial performance: empirical evidence from Sweden. *Cogent Business & Management*, 8:1912526. https://doi.org/10.1080/23311975.2021.1912526

D'Amato, V., D'Ecclesia, R. & Levantesi, S. 2022. ESG score prediction through random forest algorithm [Abstract]. *Computational Management Science,* 19: 347–373. https://doi.org/10.1007/s10287-021-00419-3

Danielson, M.G., Heck, J.L., Shaffer, D. 2008. Shareholder Theory - How Opponents and Proponents Both Get it Wrong. *SSRN*. https://dx.doi.org/10.2139/ssrn.1309066

Das, K.R. & Imon, A.H.M.R. 2016. A brief review of tests for normality. *American Journal of Theoretical and Applied Statistics,* 5(1):5-12. https://pdfs.semanticscholar.org/cf45/18fcba1feab9a8f3c20929ac0a1a154e6c23.pdf

Davit, K., Alcina, N. & José, L. 2016. Financial ratios and indicators that determine return on equity. *AECA,* 17:1-18. http://hdl.handle.net/10198/14222

De Jesus, I.R.D. & Nascimento, P.P. 2021. ESG strategies to deal with COVID-19 in a Brazilian public research company. *Brazilian Journal of Operations & Production Management*, 18(2):1-14. https://doi.org/10.14488/BJOPM.2021.028

De Soto, J.H., Sánchez-Bayón, A. & Bagus, P. 2021. Principles of Monetary & Financial Sustainability and Wellbeing in a Post-COVID-19 World: The Crisis and Its Management. *Sustainability*, 13(9):4655. https://doi.org/10.3390/su13094655

Denney, A.S. & Tewksbury, R. 2012. How to Write a Literature Review. *Journal of Criminal Justice Education*, 24(2):218-134. https://doi.org/10.1080/10511253.2012.730617

Department: Statistics South Africa. 2020. Business impact survey of the COVID-19 pandemic in South Africa. https://www.statssa.gov.za/publications/Report-00-80-01/Report-00-80-01April2020.pdf

Dincă, M.S., Vezeteu, C. & Dincă, D. 2022. The relationship between ESG and firm value. Case study of the automotive industry. *Sec. Environmental Economics and Management*, 10. https://doi.org/10.3389/fenvs.2022.1059906

Donaldson, L. & Davis, J.H. 1991. Stewardship theory or agency theory: CEO governance and shareholder returns [Abstract]. *Australian Journal of management*, 16(1):49-64. https://doi.org/10.1177/031289629101600103

Dontho, N. & Gustafsson, A. 2020. Effects of COVID-19 on business and research. *Journal of Business Research*, 117:284-289. https://doi.org/10.1016/j.jbusres.2020.06.008

Dowling, J. & Pfeffer, J. 1975. Organizational Legitimacy: Social Values and Organizational Behavior [Abstract*]. Pacific Sociological Review*, 18(1):122–136. https://doi.org/10.2307/1388226

Drake, P.P. & Fabozzi, F.J. 2012. Financial Ratio Analysis [Abstract]. *Encyclopedia of Financial Models*. https://doi.org/10.1002/9781118182635.efm0074

Drover, W., Wood, M.S. & Corbett, A.C. 2018. Toward a cognitive view of signalling theory: Individual attention and signal set interpretation. *Journal of management studies*, 55(2):209-231. https://doi.org/10.1111/joms.12282

Dube, K. 2021. Implications of COVID-19 Induced Lockdown on the South African Tourism Industry and Prospects for Recovery. *African Journal of Hospitality, Tourism and Leisure*, 10(1):270-287. https://doi.org/10.46222/ajhtl.19770720-99

Ede, C., Masuku, M.M. & Jili, N.N. 2021. Implications of COVID-19 lockdown on South African business sector. *International Journal of Financial Research*, 12(4):12-23. https://doi.org/10.5430/ijfr.v12n4p12

Elkington, J. 1997. The Triple Bottom Line. In: Russo, M.V., eds. *Environmental Management*. Sage. pp. 49-68.

Estoque, R.C. 2020. A Review of the Sustainability Concept and the State of SDG Monitoring Using Remote Sensing. *Remote Sens*, 12(11):1770. https://doi.org/10.3390/rs12111770

Fabeil, N.F., Pazim, K.H. & Langgat, J. 2020. The Impact of Covid-19 Pandemic Crisis on Micro-Enterprises: Entrepreneurs' Perspective on Business Continuity and Recovery Strategy. *Journal of Economics and Business*, 3(2):837-844. https://ssrn.com/abstract=3612830

Faello, J. 2015. Understanding the limitations of financial ratios. *Academy of accounting and financial studies journal*, 19(3):75.

Fatemi, A., Glaum, M. & Kaiser, S. 2018. ESG performance and firm value: The moderating role of disclosure. *Global Finance Journal*, 38:45-64. https://doi.org/10.1016/j.gfj.2017.03.001

Fernando, S. & Stewart, L. 2014. A Theoretical framework for CSR practices: Integrating legitimacy theory, stakeholder theory and institutional theory. *The Journal of Theoretical Accounting*, 10(1):149-178. https://www.researchgate.net/profile/Susith-Fernando/publication/290485216_A_theoretical_framework_for_CSR_practices_Integrating_legitimacy_theory_stakeholder_theory_and_institutional_theory/links/5a8629ee458515b8af890861/A-theoretical-framework-for-CSR-practices-Integrating-legitimacy-theory-stakeholder-theory-and-institutional-theory.pdf

Ferrel, O.C. 2021. Addressing socio-ecological issues in marketing: environmental, social and governance (ESG) [Abstract]. *AMR Rev,* 11:140-144. https://doi.org/10.1007/s13162-021-00201-3

Freeman, R. E. 1984. Strategic management: a stakeholder approach. Massachusetts: Pitman.

Freeman, R.E. & Dmytriyev, S. 2017. Corporate social responsibility and stakeholder theory: Learning from each other. *Symphonya. Emerging Issues in Management*, 1(1):7-15. https://doi.org/10.4468/2017.1.02freeman.dmytriyev

Friedman, M. 1970. A Friedman doctrine - The Social Responsibility of Business Is to Increase Its Profits. *The New York Times*. 13 Sep. https://www.nytimes.com/1970/09/13/archives/a-friedman-doctrine-the-social-responsibility-of-business-is-to.html Date of access: 20 Oct. 2023.

Fu, L., Singhal, R. & Parkash, M. 2016. Tobin's q ratio and firm performance. *International research journal of applied finance*, 7(4):1-10. https://www.researchgate.net/profile/Mohinder-Parkash/publication/307847236_Tobin's_q_Ratio_and_Firm_Performance/links/59494f6ba6fdcc3e17fc63a0/Tobins-q-Ratio-and-Firm-Performance.pdf?_sg%5B0%5D=started_experiment_milestone&origin=journalDetail&_rtd=e30%3D

Galant, A. & Cadez, S. 2017. Corporate social responsibility and financial performance relationship: A review of measurement approaches. *Economic research-Ekonomska istraživanja*, 30(1):676-693. https://doi.org/10.1080/1331677X.2017.1313122

Gimenez, C., Sierra, V. & Rodon, J. 2012. Sustainable operations: Their impact on the triple bottom line. *International Journal of Production Economics*, 140(1):149-159. https://doi.org/10.1016/j.ijpe.2012.01.035

Grant, C. & Osanloo, A. 2014. Understanding, selecting, and integrating a theoretical framework in dissertation research: creating the blueprint for your "house". *Administrative Issues Journal*, 4(2):12-26. https://dc.swosu.edu/aij/vol4/iss2/4

Green, H.E. 2014. Use of theoretical and conceptual frameworks in qualitative research. *Nurse researcher*, 21(6):34-38. file:///C:/Users/inged/Downloads/Green2014.PDF

Guba, E. G. & Lincoln, Y. S. 1994. Competing paradigms in qualitative research [Abstract]. In: Denzin, N.K. & Lincoln, Y.S., eds. *Handbook of qualitative research.* Thousand Oaks: Sage Publications Inc. pp. 105-117.

Hacking, I. 2002. Historical Ontology. In: Gärdenfors, P., Woleński, J. &Kijania-Placek, K., eds. In the Scope of Logic, Methodology and Philosophy of Science. Springer: Dordrecht. pp. 583-600. https://doi.org/10.1007/978-94-017-0475-5_13

Halid, S., Rahman, R.A., Mahmud, R., Mansor, N. & Wahab, R.A. 2023. A Literature Review on ESG Score and Its Impact on Firm Performance. *International Journal of Academic Research in Accounting Finance and Management Sciences*, 13(1):272-282. http://dx.doi.org/10.6007/IJARAFMS/v13-i1/15101

Hathcoat, J.D., Meixner, C. & Nicholas, M.C. 2019. Ontology and Epistemology [Abstract]. In: Liamputtong, P., eds. Handbook of Research Methods in Health Social Sciences. Singapore: Springer. pp. 99-116. https://doi.org/10.1007/978-981-10-5251-4_56

Hefer, J & Walker, T. 2020. *Financial Management: Turning Theory into Practice*. 2nd ed. South Africa: Oxford University Press. pp. 1-1050.

Hermawan, M.S., Tirok, J. & Dawis, D.S. 2010. The degree of company vulnerability using Altman model: a survey of public listed companies in Indonesia. *Journal of applied finance & accounting*, 2(2):88-99. https://doi.org/10.21512/jafa.v2i2.156

How, S.M., Lee, C.G. & Brown, D.M. 2019. Shareholder theory versus stakeholder theory in explaining financial soundness. *International Advances in Economic Research*, 25(1):133-135. https://doi.org/10.1007/s11294-019-09722-x

Hristov, I., Chirico, A. & Appolloni, A. 2019. Sustainability Value Creation, Survival, and Growth of the Company: A Critical Perspective in the Sustainability Balanced Scorecard (SBSC). *Sustainability*, 11(7):2119. https://doi.org/10.3390/su11072119

Hussain, N., Rigoni, U. & Cavezzali, E. 2018. Does it pay to be sustainable? Looking inside the black box of the relationship between sustainability performance and financial performance. Corporate Social Responsibility and Environmental Management, 25(6):1198-1211. https://doi.org/10.1002/csr.1631

Hwang, J., Kim, H. & Jung, D. 2021. The Effect of ESG Activities on Financial Performance during the COVID-19 Pandemic - Evidence from Korea. *Sustainability*, 13(20):11362. https://doi.org/10.3390/su132011362

IIRC (International Integrated Reporting Council). 2013. The IIRC Pilot Programme Yearbook 2013: Business and Investors Explore the Sustainability Perspective of Integrated Reporting. http://integratedreporting.org/wp-content/uploads/2013/11/IIRC-PP-Yearbook-2013.pdf Date of access: 7 Mar. 2023

Iivari, J & Venable, J.R. 2009. Action research and design science research - Seemingly similar but decisively dissimilar. ECIS 2009 Proceedings, 73. https://aisel.aisnet.org/cgi/viewcontent.cgi?article=1025&context=ecis2009

Iivari, J. 2007. A paradigmatic analysis of information systems as a design science. *Scandinavian journal of information systems*, 19(2):5. https://aisel.aisnet.org/cgi/viewcontent.cgi?article=1018&context=sjis

International Statistical Institute. 2023. Developing countries. https://www.isi-web.org/resources/developing-countries Date of access: 3 Jul. 2023.

InvestVerte. 2023. ESG data [Unpublished dataset].

Israel, G.D. 1992. Determining Sample Size. University of Florida: Florida Cooperative Extension Service, Fact Sheet PEOD-6:2.

Janah, O.O. & Sassi, H. 2021. The ESG impact on corporate financial performance in developing countries: A systematic literature review. *International Journal of Accounting, Finance, Auditing, Management and Economics*, 2(6):391-410. https://doi.org/10.5281/zenodo.5706449

Jang, G., Kang, H., Lee, J. & Bae, K. 2020. ESG Scores and the Credit Market. *Sustainability*, 12(8):3456. https://doi.org/10.3390/su12083456

Jankelová, N., Joniaková, Z, Blštáková, J., Procházková, K., Skorková, Z. Abuladze, L. 2021. How companies overcome crisis through the sharing of information and teamwork performance during the covid-19 pandemic. *Entrepreneurship and Sustainability issues*, 8(4):757-772. https://doi.org/10.9770/jesi.2021.8.4(47)

Jewell, J.J. & Mankin, J.A. 2011. What is Your ROA? An Investigation of the Many Formulas for Calculating Return on Assets. *Academy of Educational Leadership Journal,* 15:79-91. https://ssrn.com/abstract=2155943

Jha, M.K. & Rangarajan, K. 2020. Analysis of corporate sustainability performance and corporate financial performance causal linkage in the Indian context. *Asian Journal of Sustainability and Social Responsibility,* 5(1):1-30. https://doi.org/10.1186/s41180-020-00038-z

Johannesburg Stock Exchange (JSE). 2023. JSE History and Company Overview. https://www.jse.co.za/our-business/history-%26-company-overview Date of access: 18 Feb. 2023.

Kaczmarek, T., Perez, K., Demir, E. & Zaremba, A. 2021. How to survive a pandemic: The corporate resiliency of travel and leisure companies to the COVID-19 outbreak. *Tourism Management,* 84:104281. https://doi.org/10.1016/j.tourman.2020.104281

Kalia, D. & Aggarwal, D. 2023. Examining impact of ESG score on financial performance of healthcare companies [Abstract]. *Journal of Global Responsibility*, 14(1). https://doi.org/10.1108/JGR-05-2022-0045

Kamassi, A., Manaf, N.A.H. & Omar, A. 2020. The identity and role of stakeholders in the medical tourism industry: state of the art [Abstract]. *Tourism Review*, 75(3):559-574. https://doi.org/10.1108/TR-01-2019-0031

Kaplan, R.S & Norton, D.P. 1992. The Balanced Scorecard - Measures that Drive Performance. *Harvard Business Review.* Jan-Feb. https://hbr.org/1992/01/the-balanced-scorecard-measures-that-drive-performance-2 Date of access: 20 October 2023.

Keay, A. 2017. Stewardship theory: is board accountability necessary? *International Journal of Law and Management*, 59(6):1292-1314. https://doi.org/10.1108/IJLMA-11-2016-0118

Keerthiratne, S. & Tol, R.S.J. 2017. Impact of Natural Disasters on Financial Development. *Economics of Disasters and Climate Change*, 1:33-54. https://doi.org/10.1007/s41885-017-0002-5

Kessler, E.H., ed. 2013. Encyclopaedia of Management Theory. United States of America, USA: Janke.

Khodarahmi, E. 2009. Crisis management. *Disaster Prevention and Management*, 18(5):523-528. https://doi-org-nwulib-idm-oclc-org.nwulib.nwu.ac.za/10.1108/09653560911003714

Kijewska, A. 2016. Determinants of the return on equity ratio (ROE) on the example of companies from metallurgy and mining sector in Poland. *Metalurgija*, 55(2):258-288. https://hrcak.srce.hr/146696

Kivunja, C. 2018. Distinguishing between theory, theoretical framework, and conceptual framework: A systematic review of lessons from the field. *International journal of higher education*, 7(6):44-53. https://eric.ed.gov/?id=EJ1198682

Klakegg, O.J. 2016. Ontology and Epistemology [Abstract]. In: Pasian, B. & Turner, R., eds. Design Methods and Practices for Research of Project Management. London. https://www.taylorfrancis.com/chapters/edit/10.4324/9781315270197-16/ontology-epistemology-ole-jonny-klakegg

Klomp, J. & Valckx, K. 2014. Natural disasters and economic growth: A meta-analysis. *Global Environmental Change,* 26:183-195. https://doi.org/10.1016/j.gloenvcha.2014.02.006

Knopf, J.W. 2006. Doing a Literature Review. *PS: Political Science & Politics*, 39(1):127-132. https://doi.org/10.1017/S1049096506060264

Krzus, M.P. 2011. Integrated reporting: if not now, when? *Blickpunkt: Integrated Reporting*, 6: 271-276.

Kusumawardani, A., Haat, M.H.C., Saputra, J., Yusliza, M.Y., Muhammad, Z. & Bon, A.T. 2021. *A Review of Corporate Financial Performance Literature: A Mini-Review Approach*. Proceedings of the 11th Annual International Conference on Industrial Engineering and Operations Management, Singapore. https://scholar.googleusercontent.com/scholar?q=cache:Fj8rVUSbmYEJ:scholar.google.com/+%22importance+of+financial+performance%22&hl=en&as_sdt=0,5&as_ylo=2019&inst=12172072488891418045 Date of access: 16 Jun. 2023.

Kyere, M. & Ausloos, M. 2021. Corporate governance and firms financial performance in the United Kingdom. *International Journal of Finance & Economics*, 26(2):1871-1885. https://doi.org/10.1002/ijfe.1883

Lederman, N.G. & Lederman, J.S. 2015. What is a theoretical framework? A practical answer. *Journal of Science Teacher Education*, 26(7):593-597. https://doi.org/10.1007/s10972-015-9443-2

Lee, M.T., Raschke, R.L. & Krishen, A.S. 2022. Signaling green! firm ESG signals in an interconnected environment that promote brand valuation [Abstract]. *Journal of Business Research*, 138:1-11. https://doi.org/10.1016/j.jbusres.2021.08.061

Li, T., Wang, K., Sueyoshi, T. & Wang, D.D. 2021. ESG: Research Progress and Future Prospects. *Sustainability*, 13(21):11663. https://doi.org/10.3390/su132111663

Liesz, T. 2002. *Really modified Du Pont analysis: Five ways to improve return on equity.* Proceedings of the SBIDA Conference, Colorado. https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=ed381045b5f5a3d08b5e6d2349b4d076e7e58d4f Date of access: 22 Apr. 2023.

Listcorp. 2023. JSE Sectors. https://www.listcorp.com/jse/sectors/ Date of access: 25 Sep. 2023.

Lockett, A., Thompson, S. & Morgenstern, U. 2009. The development of the resource-based view of the firm: A critical appraisal. *International Journal of Management Reviews*, 11(1):9-28. https://doi.org/10.1111/j.1468-2370.2008.00252.x

Lone, S.A. & Ahmad, A. 2020. COVID-19 pandemic - an African perspective. *Emerging Microbes & Infections*, 9(1):1300-1308. https://doi.org/10.1080%2F22221751.2020.1775132

Lopez-de-Silanes, F., McCahery, J.A. & Pudschedl, P.C. 2020. ESG performance and disclosure: A cross-country analysis. *Singapore Journal of Legal Studies*, 1(1):217-241. https://search.informit.org/doi/abs/10.3316/agispt.20200715033349

Lozano, R., Carpenter, A. & Huisingh, D. 2015. A review of 'theories of the firm' and their contributions to Corporate Sustainability. *Journal of Cleaner Production*, 106:430-442. https://doi.org/10.1016/j.jclepro.2014.05.007

Lukamba, M.T. 2010. Natural disasters in African countries: what can we learn about them? [Abstract]. *TD: The Journal for Transdisciplinary Research in Southern Africa*, 6(2). https://journals.co.za/doi/epdf/10.10520/EJC111907

Luke, R. 2020. The impact of COVID-2019 on transport in South Africa [Abstract]. *Journal of Transport and Supply Chain Management*, 14(1). https://journals.co.za/doi/pdf/10.4102/jtscm.v14i0.545

Majid, U. 2018. Research fundamentals: Study design, population, and sample size. *URNCST Journal*, 2(1):1-17. https://doi.org/10.26685/urncst.16

Malterud, K. 2016. Theory and interpretation in qualitative studies from general practice: Why and how? *Scandinavian Journal of Public Health*, 44(2):120-129. https://doi.org/10.1177/1403494815621181

Manes-Rossi, F. 2018. Is integrated reporting a new challenge for public sector entities? *African Journal of Business Management*, 12(7):172-187. https://doi.org/10.5897/AJBM2018.8498

Mans-Kemp, N. & Van Der Lugt, C.T. 2020. Linking integrated reporting quality with sustainability performance and financial performance in South Africa. *South African Journal of Economic and Management Sciences*, 23(1):2222-3436. http://dx.doi.org/10.4102/sajems.v23i1.3572

Mardini, G.H. 2022. ESG factors and corporate financial performance. *International Journal of Managerial and Financial Accounting*, 14(3):247-264. https://doi.org/10.1504/IJMFA.2022.123895

Marx, A.C. 2019. Assessing the relationship between integrated reporting and financial indicators of selected JSE companies. Vanderbijlpark: North-West University. (Dissertation - Master of Commerce in Accountancy) https://repository.nwu.ac.za/bitstream/handle/10394/33596/Marx_AC.pdf?sequence=1&isAllowed=y

Mattera, M., Gonzalez, F.S., Ruiz-Morales, C.A. & Gava, L. 2021. Facing a global crisis - how sustainable business models helped firms overcome COVID. *Corporate Governance*, 21(6):1100-1116. https://doi-org-nwulib-idm-oclc-org.nwulib.nwu.ac.za/10.1108/CG-07-2020-0309

McCuddy, M.K. & Pirie, W.L. 2007. Spirituality, stewardship, and financial decision-making: Toward a theory of intertemporal stewardship. *Managerial Finance*, 33(12):957-969. https://doi.org/10.1108/03074350710831738

Melnikovas, A. 2018. Towards an Explicit Research Methodology: Adapting Research Onion Model for Futures Studies. *Journal of futures Studies*, 23(2). https://www.researchgate.net/profile/Aleksandras-Melnikovas/publication/333388233_Towards_an_explicit_research_methodology_Adapting_research_onion_model_for_futures_studies/links/5d47c8404585153e593cfbec/Towards-an-explicit-research-methodology-Adapting-research-onion-model-for-futures-studies.pdf?_sg%5B0%5D=started_experiment_milestone&origin=journalDetail&_rtd=e30%3D

Mertens, D.M. 2012. What Comes First? The Paradigm or the Approach? *Journal of Mixed Methods Research,* 6(4): 255-257.

Mervelskemper, L. & Streit, D. 2016. Enhancing Market Valuation of ESG Performance: Is Integrated Reporting Keeping its Promise? *Business Strategy and the Environment*, 26(4):536-549. https://doi.org/10.1002/bse.1935

Miller, N. 2023. *ESG Score*. https://corporatefinanceinstitute.com/resources/esg/esg-score/ Date of access: 4 Jul. 2023.

Mio, C., Costantini, A. & Panfilo, S. 2021. Performance measurement tools for sustainable business: A systematic literature review on the sustainability balanced scorecard use. *Corporate Social Responsibility and Environmental Management*, 29(2):367-384. https://doi.org/10.1002/csr.2206

Mocnik, F., Raposo, P., Feringa, W., Kraak, M., & Köbben. 2020. Epidemics and pandemics in maps – the case of COVID-19. *Journal of Maps*, 16(1):144-152. https://doi-org-nwulib-idm-oclc-org.nwulib.nwu.ac.za/10.1080/17445647.2020.1776646

Moosavi, J. & Hosseini, S. 2021. Simulation-based assessment of supply chain resilience with consideration of recovery strategies in the COVID-19 pandemic context. *Computers & Industrial Engineering*, 160:107593. https://doi.org/10.1016/j.cie.2021.107593

Moratis, L. 2018. Signalling responsibility? Applying signalling theory to the ISO 26000 standard for social responsibility. *Sustainability*, 10(11):4172. https://doi.org/10.3390/su10114172

Morsing, M. & Schultz, M. 2006. Corporate social responsibility communication: stakeholder information, response and involvement strategies [Abstract]. *Business Ethics, the Environment & Responsibility*, 15(4):323-338. https://doi.org/10.1111/j.1467-8608.2006.00460.x

Muthukrishna, M. & Henrich, J. 2019. A problem in theory. *Nature Human Behaviour*, 3(3):221-229. https://doi.org/10.1038/s41562-018-0522-1

Naimy, V., El Khoury, R. & Iskandar, S. 2021. ESG versus corporate financial performance: Evidence from East Asian firms in the industrials sector. *Studies of Applied Economics*, 39(3):1-24. https://doi.org/10.25115/eea.v39i3.4457

Nicolăescu, E., Alpopi, C. & Zaharia, C. 2015. Measuring Corporate Sustainability Performance. *Sustainability*, 7(1):851-865. https://doi.org/10.3390/su7010851

Nijhof, A., Schaveling, J. & Zalesky, N. 2019. Business, society, and the need for stewardship orientation. *Journal of Organizational Change Management*, 32(1):145-163. https://doi.org/10.1108/JOCM-09-2017-0348

Ntounis, N., Parker, C., Skinner, H., Steadman, C. & Warnaby, G. 2022. Tourism and Hospitality industry resilience during the Covid-19 pandemic: Evidence from England. *Current Issues in Tourism,* 25(1):46-59. https://doi.org/10.1080/13683500.2021.1883556

O'Connell, M. & Ward, A.M. 2020. Shareholder theory/shareholder value. *Encyclopedia of sustainable management*, 1(1):1-7. https://doi.org/10.1007/978-3-030-02006-4_49-1

Oberholzer, M. & Buys, P.W. 2023. A Roadmap to Business Research. In: Buys, P.W. & Oberholzer, M. eds. *Business Research. An illustrative Guide to Practical Methodological Applications in Selected Case Studies.* Singapore: Springer. pp.11-40.

Olateju, D.J., Olateju, O.A., Adeoye, S.V. & Ilyas, I.S. 2021. A critical review of the application of the legitimacy theory to corporate social responsibility. *International Journal of Managerial Studies and Research,* 9(3):1-6. https://doi.org/10.20431/2349-0349.0903001

Osborne, J.W. & Waters, E. 2019. Four assumptions of multiple regression that researchers should always test*. Practical assessment, research, and evaluation,* 8(1):2. https://doi.org/10.7275/r222-hv23

Pacelli, V., Pampurini, F. & Quaranta, A.G. 2022. Environmental, Social and Governance investing: Does rating matter? *Business Strategy and the Environment*, 32(1):30-41. https://doi.org/10.1002/bse.3116

Panigrahi, C.M.A. & Vachhani, K. 2021. Financial analysis by return on equity (ROE) and return on asset (ROA)-A comparative study of HUL and ITC. *Journal of Management Research and Analysis*, 8(3):131-138. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3940100

Panwar, V. & Sen, S. 2019. Economic Impact of Natural Disasters: An Empirical Re-examination. *Margin-The Journal of Applied Economic Research*, 13(1):109-139.

Patten, M.L. & Galvan, M.C. 2020. Proposing Empirical Research: A Guide to the Fundamentals. Routledge. https://books.google.co.za/books?hl=en&lr=&id=PqKqDwAAQBAJ&oi=fnd&pg=PP1&dq=empirical+research&ots=FBJsja0jd1&sig=Q7WmsoG0awpv30YSvtI-A446qoE&redir_esc=y#v=onepage&q=empirical%20research&f=false Date of access: 12 Mar. 2023.

Paul, J. & Criado, A.R. 2020. The art of writing literature review: What do we know and what do we need to know? *International business review*, 29(4):101717. https://doi.org/10.1016/j.ibusrev.2020.101717

Pavlopoulos, A., Magnis, C. & Iatridis, G.E. 2019. Integrated reporting: An accounting disclosure tool for high quality financial reporting. *Research in International Business and Finance*, 49:13-40. https://doi.org/10.1016/j.ribaf.2019.02.007

Peng, H. & Lu, Y. 2012. Model selection in linear mixed effect models. *Journal of Multivariate Analysis*, 109:109-129. https://doi.org/10.1016/j.jmva.2012.02.005

Penrose, E. 1995. The Theory of the Growth of the Firm [Abstract]. Oxford: Oxford University Press. https://doi.org/10.1093/0198289774.001.0001

Pereira, T.H.M. & Martins, H.C. 2021. People, Planet, and Profit: A Bibliometric Analysis of Triple Bottom Line Theory. *Journal of Management and Sustainability,* 11(1):64. https://heinonline.org/HOL/LandingPage?handle=hein.journals/jms11&div=10&id=&page=

Phelan, G. 2016. Financial Intermediation, Leverage, and Macroeconomic Instability [Abstract]. *American Economic Journal: Macroeconomics*, 8(4):199-224. https://www.aeaweb.org/articles?id=10.1257/mac.20140233

Pisani, F. & Russo, G. 2021. Sustainable Finance and COVID-19: The Reaction of ESG Funds to the 2020 Crisis. *Sustainability*, 13(23):13253. https://doi.org/10.3390/su132313253

Purwanto, A., Fahlevi, M., Zuniawan, A., Kusuma, R.D.P., Supriatna, H. & Maryani, E. 2020. The COVID-19 pandemic impact on industries performance: An explorative study of Indonesian companies. *Journal of Critical Reviews*, 7(15):1965-1972.

Queirós, A., Faria, D. & Almeida, F. 2017. Strengths and limitations of qualitative and quantitative research methods. *European Journal of Education Studies*, 3(9):369-387. https://doi.org/10.5281/zenodo.887089

R Core Team. 2022. *R: A language and environment for statistical computing*. https://www.R-project.org/ Date of access: 16 Oct. 2023.

Radivojević, V., Dimovski, J. & Mitić, G. 2023. Quantifying the financial impact of COVID-19 on the largest global companies in the hotel industry. *Hotel and Tourism Management,* 11(1):165-176. https://doi.org/10.5937/menhottur2301165R

Rajesh, R. 2020. Exploring the sustainability performances of firms using environmental, social, and governance scores. *Journal of Cleaner Production*, 247:119600. https://doi.org/10.1016/j.jclepro.2019.119600.

Reeves, S., Albert, M., Kuper, A. & Hodges, B.D. 2008. Why use theories in qualitative research? *Bmj,* 337:a949. https://doi.org/10.1136/bmj.a949

Rocco, T.S. & Plakhotnik, M.S. 2009. Literature Reviews, Conceptual Frameworks, and Theoretical Frameworks: Terms, Functions, and Distinctions. *Human Resource Development Review,* 8(1):120-130. http://dx.doi.org/10.1177/1534484309332617

Rodríguez-Antón, J.M. & Alonso-Almeida, M.d.M. 2020. COVID-19 Impacts and Recovery Strategies: The Case of the Hospitality Industry in Spain. *Sustainability*, 12(20):8599. https://doi.org/10.3390/su12208599

Rodriguez-Fernandez, M. 2016. Social responsibility and financial performance: The role of good corporate governance. *BRQ Business Research Quarterly*, 19(2):137-151. https://doi.org/10.1016/j.brq.2015.08.001

Rogerson, C.M. & Rogerson, J.M. 2020. COVID-19 tourism impacts in South Africa: Government and industry responses. *Geo Journal of Tourism and Geosites*, 31(3):1083-1091. https://doi.org/10.30892/gtg.31321-544

Rossi, M., Chouaibi, J., Chouaibi, S., Jilani, W. & Chouaibi, Y. 2021. *Journal of Risk and Financial Management*, 14(8):354. https://doi.org/10.3390/jrfm14080354

Sakamoto, M., Sasaki, D., Ono, Y., Makino, Y., Kodama, E.N. 2020. Implementation of evacuation measures during natural disasters under conditions of the novel coronavirus (COVID-19) pandemic based on a review of previous responses to complex disasters in Japan. *Progress in Disaster Science*, 8:100127. https://doi.org/10.1016/j.pdisas.2020.100127

Salmi, T. & Martikainen, T. 1994. A review of the Theoretical and Empirical Basis of Financial Ratio Analysis [Abstract]. *The Finnish Journal of Business Economics*, 4(94):426-448. https://ideas.repec.org/p/wop/scfiab/_001.html

Sanabria-Díaz, J.M., Aguiar-Quintana, T. & Araujo-Cabrera, Y. 2020. Public strategies to rescue the hospitality industry following the impact of COVID-19: A case study of the European Union. *International Journal of Hospitality Management*, 97:102988. https://doi.org/10.1016/j.ijhm.2021.102988

Sarker, M.R., Ali, S.M., Paul, S.K. & Munim, Z.H. 2021. Measuring sustainability performance using an integrated model. *Measurement*, 184:109931. https://doi.org/10.1016/j.measurement.2021.109931

Saunders, M.N.K., Lewis, P. & Thornhill, A. 2019. *Research methods for business students.* 8th ed. New York: Pearson. pp. 4-230.

Saygili, E., Arslan, S. & Birkan, A.O. 2021. ESG practices and corporate financial performance: Evidence from Borsa Istanbul. *Borsa Istanbul Review*, 22(3):525-533. https://doi.org/10.1016/j.bir.2021.07.001

Schiopoiu Burlea, A. & Popa, I. 2013. Legitimacy Theory. *Encyclopedia of Corporate Social Responsibility*. https://www.researchgate.net/profile/Adriana-Burlea-Schiopoiu/publication/303928907_Legitimacy_Theory/links/585bef9e08ae329d61f2e0b6/Legitimacy-Theory.pdf

Seens, D.L. 2013. *Small and Medium-Sized Enterprises Growth Study: Actual vs. Sustainable Growth.* https://ised-isde.canada.ca/site/sme-research-statistics/sites/default/files/attachments/2022/SMEGrowthStudy-EtudeCroissancePME_eng.pdf Date of access: 6 Jun. 2023.

Setia, N., Abhayawansa, S., Joshi, M. & Huynh, A.V. 2015. Integrated reporting in South Africa: some initial evidence. *Sustainability Accounting, Management and Policy Journal*, 6(3):397-424. https://doi.org/10.1108/SAMPJ-03-2014-0018

Shabnam, N. 2014. Natural Disasters and Economic Growth: A Review. *International Journal of Disaster Risk Science*, 5:157-163. https://doi.org/10.1007/s13753-014-0022-5

Shaluf, I.M, Ahmadum, F. & Mat Said, M. 2003. A review of disaster and crisis. *Disaster Prevention and Management*, 12(1):24-32. https://doi.org/10.1108/09653560310463829

Shen, H., Fua, M., Panb, H., Yua, Z. & Chen, Y. 2020. The Impact of the COVID-19 Pandemic on Firm Performance. *Emerging markets finance and trade*, 56(10):2213-2230.

Sinha Ray, R. & Goel, S. 2023. Impact of ESG score on financial performance of Indian firms: static and dynamic panel regression analyses [Abstract]. *Applied Economics*, 55(15):1742-1755. https://doi.org/10.1080/00036846.2022.2101611

Skae, F.O., ed. 2022. *Managerial Finance*. 9th ed. South Africa: LexisNexis. pp. 337-420.

Smith, B. 2012. Ontology. In The furniture of the world. Leiden, The Netherlands: Brill. pp. 47-68. https://doi.org/10.1163/9789401207799_005

Spence, M. 1973. Job Market Signaling [Abstract]. *The Quarterly Journal of Economics*, 87(3):355-374. https://doi.org/10.2307/1882010

Strouhal, J., Štamfestová, P., Ključnikov, A. & Vincúrová, Z. 2018. Different approaches to the EBIT construction and their impact on corporate financial performance based on the return on assets: some evidence from Czech top100 companies. *Journal of competitiveness*, 10(1):144-154. https://www.researchgate.net/profile/Aleksandr-Kljucnikov/publication/324115027_DIFFERENT_APPROACHES_TO_THE_EBIT_CON-STRUCTION_AND_THEIR_IMPACT_ON_CORPO-RATE_FINANCIAL_PERFORMANCE_BASED_ON_THE_RETURN_ON_ASSETS_SOME_EVIDENCE_FROM_CZECH_TOP100_COMPANIES/links/5abe7f6eaca27222c7577227/DIFFERENT-APPROACHES-TO-THE-EBIT-CON-STRUCTION-AND-THEIR-IMPACT-ON-CORPO-RATE-FINANCIAL-PERFORMANCE-BASED-ON-THE-RETURN-ON-ASSETS-SOME-EVIDENCE-FROM-CZECH-TOP100-COMPANIES.pdf?_sg%5B0%5D=started_experiment_milestone&origin=journalDetail

Sucheran, R. 2021. The COVID-19 pandemic and guesthouses in South Africa: Economic impacts and recovery measures. *Development Southern Africa*, 39(1):35-50. https://doi.org/10.1080/0376835X.2021.2003758

Torraco, R.J. 2005. Writing Integrative Literature Reviews: Guidelines and Examples. *Human Resource Development Review*, 4(3):356-367. https://journals.sagepub.com/doi/pdf/10.1177/1534484305278283

Travergård, A. & Pettersson, E. 2023. *Covid-19, Sustainability and Financial Performance - Investigating the effect Covid-19 had on the relationship between ESG and Tobin's Q.* Uppsala: Uppsala University. (Thesis – MSc).

United Nations (UN). 2023. Sustainable Development Goals. https://sdgs.un.org/goals Date of access: 14 Apr. 2023.

Vaz, N., Fernandez-Feijoo, B. & Ruiz, S. 2016. Integrated reporting: an international overview. *Business Ethics, the Environment & Responsibility*, 25(4):577-591. https://doi.org/10.1111/beer.12125

Velte, P. 2017. Does ESG performance have an impact on financial performance? Evidence from Germany. *Journal of Global Responsibility*, 8(2):169-178. https://doi.org/10.1108/JGR-11-2016-0029

Wacker, J.G. 1998. A definition of theory: research guidelines for different theory-building research methods in operations management. *Journal of Operations Management*, 16(4):361-385. https://doi.org/10.1016/S0272-6963(98)00019-9

Waddock, S.A. & Graves, S.B. 1997. The corporate social performance–financial performance link. *Strategic Management Journal*, 18(4):303-319. https://doi.org/10.1002/(SICI)1097-0266(199704)18:4%3C303::AID-SMJ869%3E3.0.CO;2-G

Warrad, L.H. & Nassar, M. 2017. Could Profitability, Activity and Use of Equity Finance Increasing DuPont Model of Return on Equity? Jordanian Case. *International Review of Management and Marketing*, 7(3):35-41. https://www.proquest.com/openview/cb72d61037fefcbc1f93dd5df5f5e01d/1?pq-origsite=gscholar&cbl=816339

Watson, J.T, Gayer, M & Connolly, M.A. 2007. Epidemics after Natural Disasters*. Emerging Infectious Diseases,* 13(1):1. https://doi.org/10.3201/eid1301.060779

Winter, G. 2000. A Comparative Discussion of the Notion of 'Validity' in Qualitative and Quantitative Research. *The Qualitative Report*, 4(3):1-14. http://www.nova.edu/ssss/QR/QR4-3/winter.html

Yaffee, R. 2003. A primer for panel data analysis. *Connect: Information Technology at NYU*, 8(3):1-11. https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=6ca3508b44efc159527b596bb3133beb6c8bb365

Yasar, B., Martin, T. & Kiessling, T. 2020. An empirical test of signalling theory. Management Research Review, 43(11):1309-1335. https://doi.org/10.1108/MRR-08-2019-0338

Yeon, J., Song, H.J., Yu, H.C., Vaughan, Y. & Lee, S. 2021. Are socially responsible firms in the U.S. tourism and hospitality industry better off during COVID-19? *Tourism Management*, 85:104321. https://doi.org/10.1016/j.tourman.2021.104321

Yoo, S., Keeley, A.R. & Managi, S. 2021. Does sustainability activities performance matter during financial crises? Investigating the case of COVID-19. *Energy Policy*, 155:112330. https://doi.org/10.1016/j.enpol.2021.112330

Yost, E, Kizildag, M. & Ridderstaat, J. 2021. Financial recovery strategies for restaurants during COVID-19: Evidence from the US restaurant industry. *Journal of Hospitality and Tourism Management*, 47:408-412. https://doi.org/10.1016/j.jhtm.2021.04.012

Yuen, M.K., Le, T.N.T.D.Q. & Ho, T.H. 2022. The environment, social and governance (ESG) activities and profitability under COVID-19: evidence from the global banking sector. *Journal of Economics and Development*, 24(4):345-364. https://doi.org/10.1108/JED-08-2022-0136

Zhao, C., Guo, Y., Yuan, J., Wu, M., Li, D., Zhou, Y. & Kang, J. 2018. ESG and corporate financial performance: Empirical evidence from China's listed power generation companies. *Sustainability,* 10(8):2607. https://doi.org/10.3390/su10082607

Zheng, J., Khurram, M.U. & Chen, L. 2022. Can green innovation affect ESG ratings and financial performance? Evidence from Chinese GEM listed companies*.* *Sustainability*, 14(14):8677. https://doi.org/10.3390/su14148677

Zhong, L., Sun, S., Law, R. & Li, X. 2021. Tourism crisis management: evidence from COVID-19. *Current Issues in Tourism,* 24(19):2671-2682. https://doi.org/10.1080/13683500.2021.1901866

Zhou, G., Liu, L. & Luo, S. 2022. Sustainable development, ESG performance and company market value: Mediating effect of financial performance*.* *Business Strategy and the Environment*, 31(7):3371-3387. https://doi.org/10.1002/bse.3089

Zumente, I. & Bistrova, J. 2021. ESG importance for long-term shareholder value creation: Literature vs. practice. *Journal of Open Innovation: Technology, Market, and Complexity*, 7(2):127. https://doi.org/10.3390/joitmc7020127

APPENDIX A: DISTRIBUTION OF COMPANIES AND ITS INDUSTRY

Name	**Industry**
Adcorp Holdings Limited	Industrials
ADvTECH Limited	Consumer Defensive
AECI Ltd	Basic Materials
African Media Entertainment Limited	Communication Services
African Rainbow Minerals Limited	Basic Materials
Afrimat Limited	Basic Materials
AH-Vest Limited	Consumer Defensive
Anglo American Platinum Limited	Basic Materials
ArcelorMittal South Africa Ltd	Basic Materials
Argent Industrial Limited	Basic Materials
Astral Foods Limited	Consumer Defensive
Aveng Limited	Industrials
AVI Limited	Consumer Defensive
Barloworld Limited	Industrials
Bell Equipment Limited	Industrials
Bid Corporation Limited	Consumer Defensive
Blue Label Telecoms Limited	Communication Services
Bowler Metcalf Limited	Consumer Cyclical
Brikor Limited	Industrials
Calgro M3 Holdings Limited	Consumer Cyclical
Cashbuild Limited	Consumer Cyclical
Caxton and CTP Publishers and Printers Limited	Communication Services
City Lodge Hotels Limited	Consumer Cyclical
Cognition Holdings Limited	Industrials
Combined Motor Holdings Limited	Consumer Cyclical
Crookes Brothers Limited	Consumer Defensive
Curro Holdings Limited	Consumer Defensive
Deneb Investments Limited	Industrials
eMedia Holdings Limited	Communication Services

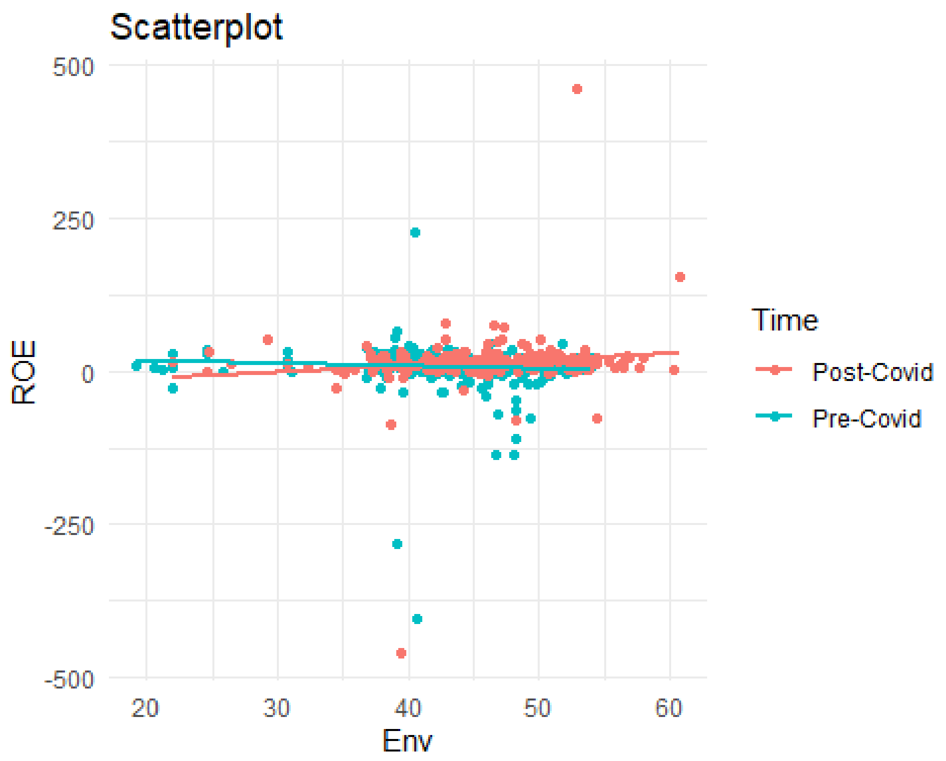
enX Group Limited	Industrials
Famous Brands Limited	Consumer Cyclical
Frontier Transport Holdings Limited	Industrials
Grand Parade Investments Limited	Consumer Cyclical
Grindrod Limited	Industrials
HomeChoice International plc	Consumer Cyclical
Hosken Consolidated Investments Limited	Industrials
Hudaco Industries Limited	Industrials
Huge Group Limited	Communication Services
Hulamin Limited	Basic Materials
Impala Platinum Holdings Limited	Basic Materials
Insimbi Industrial Holdings Limited	Industrials
Invicta Holdings Limited	Industrials
Italtile Limited	Consumer Cyclical
Kaap Agri Limited	Consumer Defensive
KAP Industrial Holdings Limited	Industrials
Kumba Iron Ore Limited	Basic Materials
Lewis Group Limited	Consumer Cyclical
Libstar Holdings Limited	Consumer Defensive
Master Drilling Group Limited	Industrials
Merafe Resources Limited	Basic Materials
Metair Investments Limited	Consumer Cyclical
Metrofile Holdings Limited	Industrials
Motus Holdings Limited	Consumer Cyclical
Mpact Limited	Consumer Cyclical
Mr Price Group Limited	Consumer Cyclical
MTN Group Limited	Communication Services
MultiChoice Group Limited	Communication Services
Murray & Roberts Holdings Limited	Industrials
Nampak Limited	Consumer Cyclical
Naspers Limited	Communication Services
Nictus Limited	Consumer Cyclical

Novus Holdings Limited	Industrials
Oceana Group Limited	Consumer Defensive
Omnia Holdings Limited	Industrials
Pepkor Holdings Limited	Consumer Cyclical
Pick n Pay Stores Limited	Consumer Cyclical
PPC Ltd	Basic Materials
Primeserv Group Limited	Industrials
Quantum Foods Holdings Ltd	Consumer Defensive
Raubex Group Limited	Industrials
RCL Foods Limited	Consumer Defensive
Reunert Limited	Industrials
RFG Holdings Limited	Consumer Defensive
Royal Bafokeng Platinum Limited	Basic Materials
Santova Limited	Industrials
Sappi Limited	Basic Materials
Sasol Limited	Basic Materials
Sephaku Holdings Limited	Basic Materials
Shoprite Holdings Limited	Consumer Cyclical
Sibanye Stillwater Limited	Basic Materials
South Ocean Holdings Limited	Industrials
Spur Corporation Ltd	Consumer Cyclical
Stadio Holdings Limited	Consumer Defensive
Stefanutti Stocks Holdings Limited	Industrials
Steinhoff International Holdings N.V.	Consumer Cyclical
Sun International Limited	Consumer Cyclical
Super Group Limited	Industrials
TeleMasters Holdings Limited	Communication Services
Telkom SA SOC Limited	Communication Services
The Bidvest Group Limited	Industrials
The Foschini Group Limited	Consumer Cyclical
The SPAR Group Ltd	Consumer Defensive
Tiger Brands Limited	Consumer Defensive

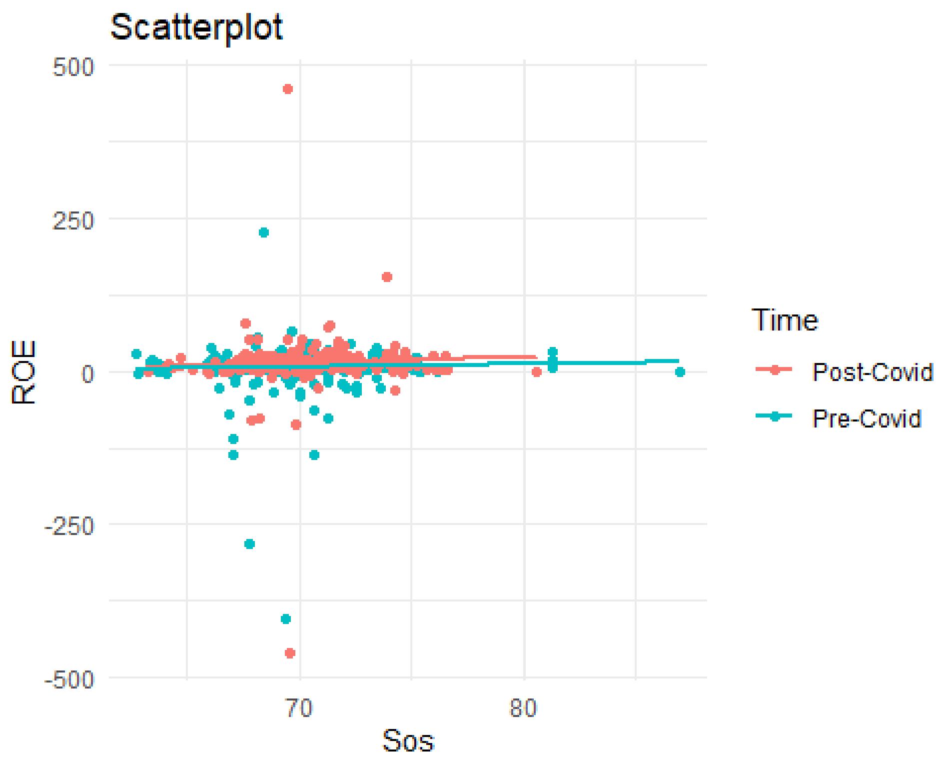
Transpaco Limited	Consumer Cyclical
Trellidor Holdings Limited	Industrials
Trencor Limited	Industrials
Truworths International Limited	Consumer Cyclical
Tsogo Sun Gaming Limited	Consumer Cyclical
Vodacom Group Limited	Communication Services
Wesizwe Platinum Limited	Basic Materials
Wilson Bayly Holmes-Ovcon Limited	Industrials
Woolworths Holdings Limited	Consumer Cyclical
Workforce Holdings Limited	Industrials
York Timber Holdings Limited	Basic Materials

APPENDIX B: SCATTERPLOTS – CORRELATIONS

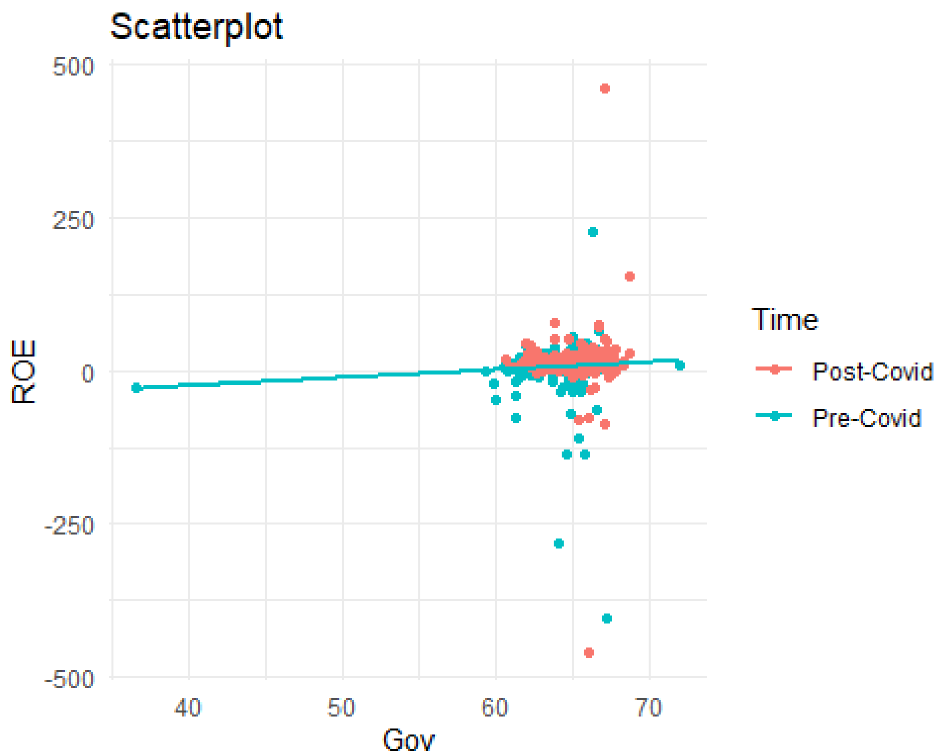
Correlation between ROE and E before and after COVID-19



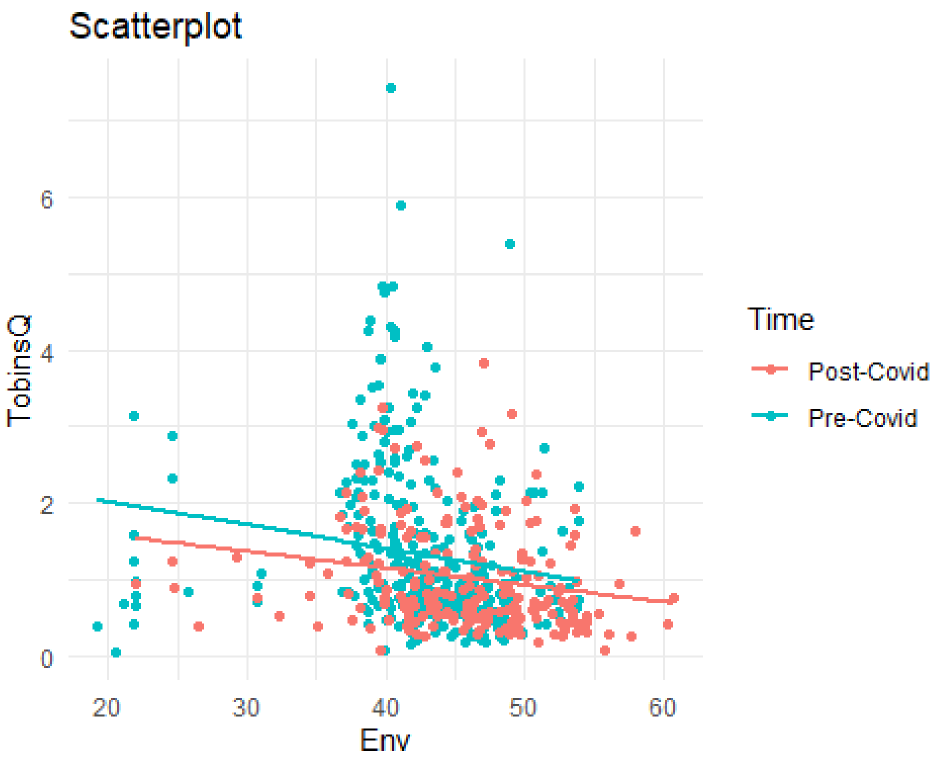
Correlation between ROE and S before and after COVID-19



Correlation between ROE and G before and after COVID-19



Correlation between Tobin's Q and E before and after COVID-19



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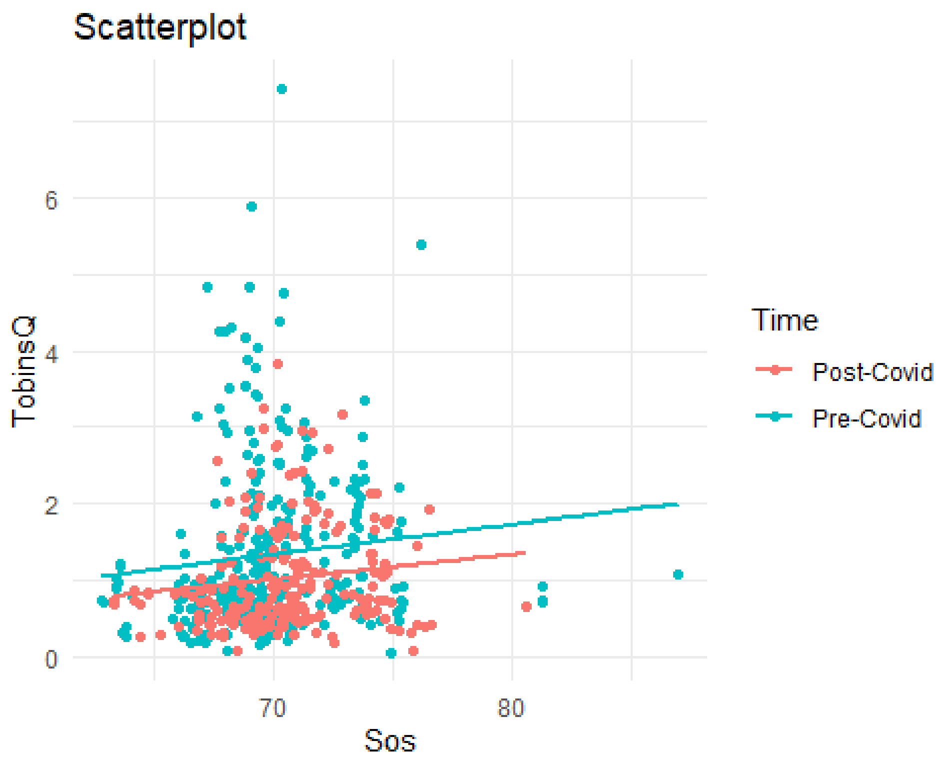
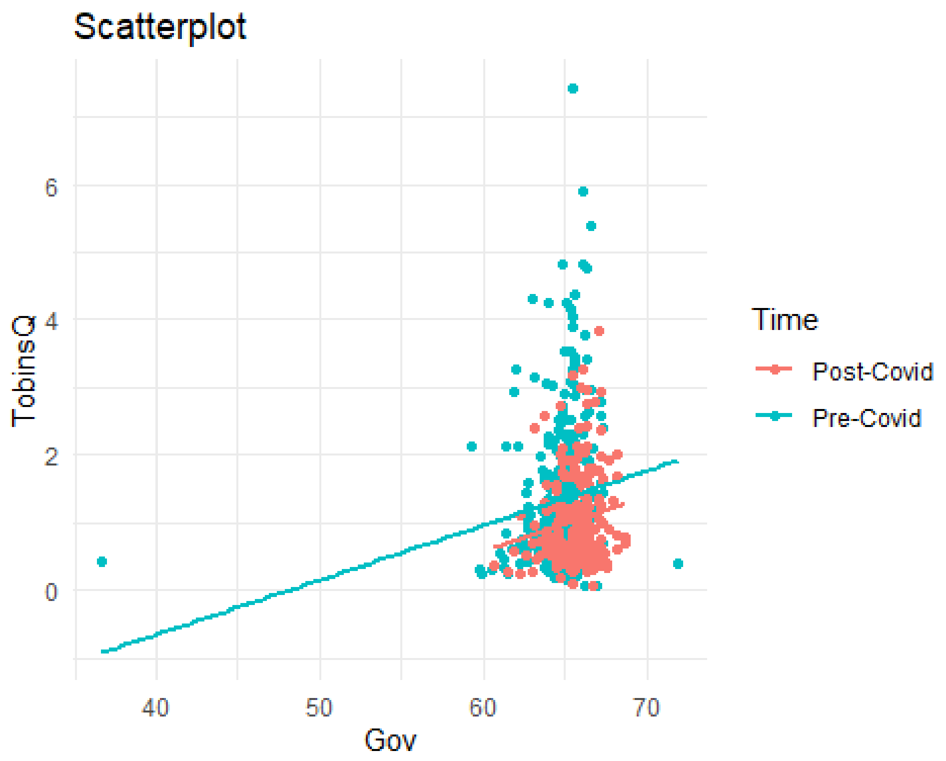


Correlation between Tobin's Q and G before and after COVID-19



APPENDIX C: FINANCIAL PERFORMANCE – ALL COMPANIES

	Before COVID-19
	After COVID-19

Year	Basic materials	ROE (%)	Tobin's Q
2017	AECI Ltd	10,29	0,92
2018	AECI Ltd	9,86	0,82
2019	AECI Ltd	11,83	0,92
2021	AECI Ltd	10,4	0,75
2022	AECI Ltd	7,97	0,58
2017	African Rainbow Minerals Limited	5,84	0,65
2018	African Rainbow Minerals Limited	17,61	0,78
2019	African Rainbow Minerals Limited	12,61	1,14
2021	African Rainbow Minerals Limited	31,41	1,13
2017	Afrimat Limited	23,16	2,23
2018	Afrimat Limited	20,15	1,77
2019	Afrimat Limited	21,55	1,64
2021	Afrimat Limited	26,72	1,46
2022	Afrimat Limited	25,77	1,92
2017	Anglo American Platinum Limited	4,68	1,23
2018	Anglo American Platinum Limited	14,47	1,58
2019	Anglo American Platinum Limited	30,5	3,15
2021	Anglo American Platinum Limited	77,27	2,57
2022	Anglo American Platinum Limited	50,79	2,02
2017	ArcelorMittal South Africa Ltd	-63,64	0,35
2018	ArcelorMittal South Africa Ltd	17,21	0,21
2019	ArcelorMittal South Africa Ltd	-137,33	0,26
2021	ArcelorMittal South Africa Ltd	73,18	0,47
2022	ArcelorMittal South Africa Ltd	22,56	0,32
2017	Argent Industrial Limited	5,05	0,4
2018	Argent Industrial Limited	-19,15	0,38
2019	Argent Industrial Limited	8,26	0,39
2021	Argent Industrial Limited	11,68	0,49
2022	Argent Industrial Limited	15,07	0,54
2017	Hulamin Limited	7,15	0,29
2018	Hulamin Limited	-20,34	0,31
2019	Hulamin Limited	-46,86	0,25
2021	Hulamin Limited	20,23	0,37
2022	Hulamin Limited	9,27	0,28
2017	Impala Platinum Holdings Limited	-17,56	0,53
2018	Impala Platinum Holdings Limited	-28,7	0,41
2019	Impala Platinum Holdings Limited	3,76	0,91
2021	Impala Platinum Holdings Limited	53,55	1,55
2022	Impala Platinum Holdings Limited	27,94	1,02
2017	Kumba Iron Ore Limited	35,48	1,91
2018	Kumba Iron Ore Limited	27,27	1,46

2019	Kumba Iron Ore Limited	44,88	1,96
2021	Kumba Iron Ore Limited	74,56	1,79
2022	Kumba Iron Ore Limited	36,47	1,92
2017	Merafe Resources Limited	19,72	0,6
2018	Merafe Resources Limited	13,97	0,54
2019	Merafe Resources Limited	-40,28	0,44
2021	Merafe Resources Limited	44,39	0,57
2022	Merafe Resources Limited	32,56	0,52
2021	Northam Platinum Holdings Limited	49,34	3,09
2022	Northam Platinum Holdings Limited	40,91	1,34
2017	PPC Ltd	1,16	0,91
2018	PPC Ltd	1,92	0,9
2019	PPC Ltd	2,55	0,57
2021	PPC Ltd	2,75	0,32
2022	PPC Ltd	1,25	0,4
2017	Royal Bafokeng Platinum Limited	-7,05	0,55
2018	Royal Bafokeng Platinum Limited	0,99	0,43
2019	Royal Bafokeng Platinum Limited	0,4	0,67
2021	Royal Bafokeng Platinum Limited	26,83	1,18
2022	Royal Bafokeng Platinum Limited	13,45	1,23
2017	Sappi Limited	19,1	0,94
2018	Sappi Limited	15,35	0,82
2019	Sappi Limited	10,28	0,48
2021	Sappi Limited	0,65	0,48
2022	Sappi Limited	19,88	0,41
2017	Sasol Limited	9,62	0,75
2018	Sasol Limited	3,91	0,88
2019	Sasol Limited	1,95	0,65
2021	Sasol Limited	6,17	0,6
2022	Sasol Limited	20,65	0,66
2017	Sephaku Holdings Limited	6,93	0,74
2018	Sephaku Holdings Limited	4,27	0,63
2019	Sephaku Holdings Limited	4,06	0,47
2021	Sephaku Holdings Limited	1,78	0,42
2022	Sephaku Holdings Limited	3,89	0,41
2019	Sibanye Stillwater Limited	0,21	2,13
2021	Sibanye Stillwater Limited	41,35	1,1
2022	Sibanye Stillwater Limited	20,88	0,96
2017	Wesizwe Platinum Limited	-3,13	0,63
2018	Wesizwe Platinum Limited	-3,03	0,68
2019	Wesizwe Platinum Limited	3,2	0,72
2021	Wesizwe Platinum Limited	-0,76	0,77
2017	York Timber Holdings Limited	12,27	0,39
2018	York Timber Holdings Limited	4,46	0,32
2019	York Timber Holdings Limited	-1,17	0,25
2021	York Timber Holdings Limited	4,62	0,25
2022	York Timber Holdings Limited	0,95	0,28

	Communication		
2017	African Media Entertainment Limited	21,46	1,97
2018	African Media Entertainment Limited	17,83	1,45
2019	African Media Entertainment Limited	9,1	1,1
2021	African Media Entertainment Limited	0,12	0,69
2022	African Media Entertainment Limited	11,71	1,24
2017	Blue Label Telecoms Limited	15,94	1,4
2018	Blue Label Telecoms Limited	10,63	0,9
2019	Blue Label Telecoms Limited	-280,53	0,74
2021	Blue Label Telecoms Limited	25,97	0,62
2022	Blue Label Telecoms Limited	25,13	0,71
2017	Caxton and CTP Publishers and Printers Limited	7,82	0,62
2018	Caxton and CTP Publishers and Printers Limited	6,78	0,51
2019	Caxton and CTP Publishers and Printers Limited	5,85	0,41
2021	Caxton and CTP Publishers and Printers Limited	8,66	0,38
2022	Caxton and CTP Publishers and Printers Limited	8,07	0,34
2017	eMedia Holdings Limited	1,7	0,77
2018	eMedia Holdings Limited	-34,61	0,64
2019	eMedia Holdings Limited	1,05	0,65
2021	eMedia Holdings Limited	2,74	0,61
2022	eMedia Holdings Limited	10,29	0,6
2017	Huge Group Limited	7	4,83
2018	Huge Group Limited	10,28	4,24
2019	Huge Group Limited	11,25	3,03
2021	Huge Group Limited	3,8	2,09
2022	Huge Group Limited	33,35	0,42
2017	MTN Group Limited	4,76	1,46
2018	MTN Group Limited	10,28	1,07
2019	MTN Group Limited	10,68	1
2021	MTN Group Limited	12,38	1,24
2022	MTN Group Limited	16,58	0,96
2019	MultiChoice Group Limited	-13,11	1,56
2021	MultiChoice Group Limited	17,39	1,65
2022	MultiChoice Group Limited	12,4	1,65
2017	Naspers Limited	19,28	4,31
2018	Naspers Limited	41,16	2,94
2019	Naspers Limited	23,38	3,26
2021	Naspers Limited	17,93	2,4
2022	Naspers Limited	51,94	1,28
2017	TeleMasters Holdings Limited	7,08	0,65
2018	TeleMasters Holdings Limited	8,69	0,84
2019	TeleMasters Holdings Limited	2,97	0,84
2021	TeleMasters Holdings Limited	-11,66	1,91
2022	TeleMasters Holdings Limited	-5,46	2,08
2017	Telkom SA SOC Limited	13,77	0,98
2018	Telkom SA SOC Limited	11,29	0,66
2019	Telkom SA SOC Limited	9,45	0,79

2021	Telkom SA SOC Limited	7,72	0,47
2022	Telkom SA SOC Limited	7,72	0,44
2017	Vodacom Group Limited	55,76	3,52
2018	Vodacom Group Limited	23,8	2,29
2019	Vodacom Group Limited	19	1,59
2021	Vodacom Group Limited	20,89	1,68
2022	Vodacom Group Limited	21,61	1,94
	Consumer cyclical		
2017	Bowler Metcalf Limited	-0,16	0,7
2018	Bowler Metcalf Limited	18,31	0,92
2019	Bowler Metcalf Limited	31,21	0,71
2021	Bowler Metcalf Limited	12,48	0,81
2022	Bowler Metcalf Limited	11,74	0,77
2017	Calgro M3 Holdings Limited	16,53	1,22
2018	Calgro M3 Holdings Limited	10,31	0,89
2019	Calgro M3 Holdings Limited	0,4	0,83
2021	Calgro M3 Holdings Limited	2,29	0,52
2022	Calgro M3 Holdings Limited	13,69	0,6
2017	Cashbuild Limited	28,02	2,53
2018	Cashbuild Limited	22,21	2,06
2019	Cashbuild Limited	19,82	1,77
2021	Cashbuild Limited	26,05	1,2
2022	Cashbuild Limited	20,28	1,18
2017	City Lodge Hotels Limited	31,59	2,79
2018	City Lodge Hotels Limited	26,42	2,64
2019	City Lodge Hotels Limited	18,56	1,84
2021	City Lodge Hotels Limited	-85,93	1,28
2022	City Lodge Hotels Limited	8,38	1,33
2017	Combined Motor Holdings Limited	34,41	0,87
2018	Combined Motor Holdings Limited	35,42	0,92
2019	Combined Motor Holdings Limited	29,05	0,78
2021	Combined Motor Holdings Limited	18,56	0,68
2022	Combined Motor Holdings Limited	33,76	0,89
2017	Famous Brands Limited	29,91	5,9
2018	Famous Brands Limited	1,44	4,25
2019	Famous Brands Limited	-33,79	3,88
2022	Famous Brands Limited	52,83	3,84
2017	Grand Parade Investments Limited	0,9	0,68
2018	Grand Parade Investments Limited	-2,51	0,58
2019	Grand Parade Investments Limited	-1,92	0,77
2021	Grand Parade Investments Limited	-1,7	0,76
2022	Grand Parade Investments Limited	-1,03	0,82
2017	HomeChoice International plc	21,78	1,44
2018	HomeChoice International plc	19,67	1,34
2019	HomeChoice International plc	15,44	1,18
2021	HomeChoice International plc	5,12	0,98
2022	HomeChoice International plc	8,71	0,8

2017	Italtile Limited	22,76	3,08
2018	Italtile Limited	20,46	2,53
2019	Italtile Limited	22,35	2,5
2021	Italtile Limited	27,04	2,4
2022	Italtile Limited	27,63	2,04
2017	Lewis Group Limited	6,57	0,68
2018	Lewis Group Limited	4,85	0,69
2019	Lewis Group Limited	6,35	0,46
2021	Lewis Group Limited	8,88	0,46
2022	Lewis Group Limited	10,24	0,59
2017	Metair Investments Limited	13,64	0,79
2018	Metair Investments Limited	16,02	0,7
2019	Metair Investments Limited	14,9	0,79
2021	Metair Investments Limited	17,95	0,83
2022	Metair Investments Limited	-0,8	0,71
2019	Motus Holdings Limited	15,73	0,58
2021	Motus Holdings Limited	17,41	0,67
2022	Motus Holdings Limited	23,63	0,67
2017	Mpact Limited	6,66	0,75
2018	Mpact Limited	7,16	0,65
2019	Mpact Limited	-23,56	0,62
2021	Mpact Limited	13,3	0,81
2022	Mpact Limited	16,23	0,65
2017	Mr Price Group Limited	33,57	4,75
2018	Mr Price Group Limited	37,3	7,42
2019	Mr Price Group Limited	34,35	4,38
2021	Mr Price Group Limited	24,43	2,95
2022	Mr Price Group Limited	27,76	2,92
2017	Nampak Limited	2,52	0,86
2018	Nampak Limited	4,82	0,79
2019	Nampak Limited	-9,54	0,64
2021	Nampak Limited	4,29	0,53
2022	Nampak Limited	-3,15	0,49
2017	Nictus Limited	6,94	0,06
2018	Nictus Limited	5,27	0,05
2019	Nictus Limited	6,6	0,07
2021	Nictus Limited	9,29	0,07
2022	Nictus Limited	4,76	0,08
2017	Pepkor Holdings Limited	6,71	3,34
2018	Pepkor Holdings Limited	5,18	2,31
2019	Pepkor Holdings Limited	3,82	2,26
2021	Pepkor Holdings Limited	8,38	2,13
2022	Pepkor Holdings Limited	9,74	1,8
2017	Pick n Pay Stores Limited	30,48	2,08
2018	Pick n Pay Stores Limited	32,22	1,98
2019	Pick n Pay Stores Limited	38,21	1,86
2021	Pick n Pay Stores Limited	28,56	1,25

2022	Pick n Pay Stores Limited	32,69	1,12
2017	Shoprite Holdings Limited	19,63	2,3
2018	Shoprite Holdings Limited	18,99	2,32
2019	Shoprite Holdings Limited	16,35	1,69
2021	Shoprite Holdings Limited	22,97	1,66
2022	Shoprite Holdings Limited	22,41	1,74
2017	Spur Corporation Ltd	16,26	4,83
2018	Spur Corporation Ltd	18,28	4,16
2019	Spur Corporation Ltd	19,07	3,53
2021	Spur Corporation Ltd	14,97	3,25
2022	Spur Corporation Ltd	18,01	2,77
2017	Steinhoff International Holdings N.V.	-403,18	2,58
2018	Steinhoff International Holdings N.V.	226,6	1,19
2019	Steinhoff International Holdings N.V.	66,89	1,47
2021	Steinhoff International Holdings N.V.	19,11	1,61
2022	Steinhoff International Holdings N.V.	14,82	2
2017	Sun International Limited	9,37	1,04
2018	Sun International Limited	-0,28	1,09
2019	Sun International Limited	24,91	0,94
2021	Sun International Limited	13,1	1,1
2022	Sun International Limited	23,55	1,11
2017	The Foschini Group Limited	22,36	2,39
2018	The Foschini Group Limited	18,35	2,95
2019	The Foschini Group Limited	18,44	2,11
2021	The Foschini Group Limited	-10,82	1,65
2022	The Foschini Group Limited	15,2	1,69
2017	Transpaco Limited	15,39	1
2018	Transpaco Limited	15,72	0,74
2019	Transpaco Limited	8,97	0,68
2021	Transpaco Limited	15,02	0,54
2022	Transpaco Limited	18,45	0,54
2017	Truworths International Limited	29,92	2,96
2018	Truworths International Limited	25,49	3,25
2019	Truworths International Limited	9,5	3,02
2021	Truworths International Limited	31,51	2,44
2022	Truworths International Limited	49,97	1,97
2017	Tsogo Sun Gaming Limited	23,28	1,78
2018	Tsogo Sun Gaming Limited	18,12	1,61
2019	Tsogo Sun Gaming Limited	14,88	1,31
2021	Tsogo Sun Gaming Limited	1,43	1,55
2022	Tsogo Sun Gaming Limited	44,57	1,91
2017	Woolworths Holdings Limited	28,61	2,87
2018	Woolworths Holdings Limited	-27,07	2,52
2019	Woolworths Holdings Limited	-11,52	2,14
2021	Woolworths Holdings Limited	43,48	1,81
2022	Woolworths Holdings Limited	31,55	1,74
	Consumer defensive		

2017	ADvTECH Limited	12,96	2,7
2018	ADvTECH Limited	12,64	2,25
2019	ADvTECH Limited	13,8	1,51
2021	ADvTECH Limited	15,19	1,88
2022	ADvTECH Limited	16,42	1,72
2017	AH-Vest Limited	6,73	0,63
2018	AH-Vest Limited	5,25	0,7
2019	AH-Vest Limited	22,17	0,5
2021	AH-Vest Limited	23,07	0,52
2022	AH-Vest Limited	4,55	0,44
2017	Astral Foods Limited	24,96	1,35
2018	Astral Foods Limited	38,4	1,62
2019	Astral Foods Limited	17,01	0,94
2021	Astral Foods Limited	11,39	1,02
2022	Astral Foods Limited	22,32	0,88
2017	AVI Limited	32,01	3,78
2018	AVI Limited	32,56	4,04
2019	AVI Limited	35,35	3,43
2021	AVI Limited	37,39	2,75
2022	AVI Limited	36,53	2,37
2017	Bid Corporation Limited	17,02	2,3
2018	Bid Corporation Limited	13,35	2,11
2019	Bid Corporation Limited	14,4	2,19
2021	Bid Corporation Limited	11,09	2,14
2022	Bid Corporation Limited	15,64	1,78
2017	Crookes Brothers Limited	6,22	0,77
2018	Crookes Brothers Limited	-0,75	0,73
2019	Crookes Brothers Limited	2,48	0,63
2021	Crookes Brothers Limited	2,24	0,56
2022	Crookes Brothers Limited	5,8	0,53
2017	Curro Holdings Limited	4,16	2,6
2018	Curro Holdings Limited	4,73	1,58
2019	Curro Holdings Limited	3,74	1,16
2021	Curro Holdings Limited	3,64	0,97
2022	Curro Holdings Limited	3,3	0,77
2017	Kaap Agri Limited	15,25	1,34
2018	Kaap Agri Limited	14,15	1,03
2019	Kaap Agri Limited	15,19	0,82
2021	Kaap Agri Limited	14,03	0,87
2022	Kaap Agri Limited	14,73	0,83
2018	Libstar Holdings Limited	4,11	1,35
2019	Libstar Holdings Limited	5,13	1,29
2021	Libstar Holdings Limited	2,96	0,99
2022	Libstar Holdings Limited	-0,1	0,91
2017	Oceana Group Limited	12,78	2,57
2018	Oceana Group Limited	18,55	2,3
2019	Oceana Group Limited	12,32	2,04

2021	Oceana Group Limited	12,75	1,71
2022	Oceana Group Limited	10,75	1,26
2017	Quantum Foods Holdings Ltd	7,54	0,27
2018	Quantum Foods Holdings Ltd	19,53	0,32
2019	Quantum Foods Holdings Ltd	10,3	0,26
2021	Quantum Foods Holdings Ltd	5,29	0,35
2022	Quantum Foods Holdings Ltd	1,13	0,29
2017	RCL Foods Limited	4,98	1,12
2018	RCL Foods Limited	8,29	1,1
2019	RCL Foods Limited	-1,02	0,83
2021	RCL Foods Limited	9,25	0,65
2022	RCL Foods Limited	8,85	0,56
2017	RFG Holdings Limited	10,57	1,62
2018	RFG Holdings Limited	6,71	1,31
2019	RFG Holdings Limited	8,76	1,24
2021	RFG Holdings Limited	7,88	0,93
2022	RFG Holdings Limited	11,93	0,63
2017	Stadio Holdings Limited	-0,51	5,39
2018	Stadio Holdings Limited	3,83	3,05
2019	Stadio Holdings Limited	4,44	1,7
2021	Stadio Holdings Limited	7,63	2,72
2022	Stadio Holdings Limited	9,35	3,16
2017	The SPAR Group Ltd	27,68	1,58
2018	The SPAR Group Ltd	25,7	1,53
2019	The SPAR Group Ltd	28,97	1,56
2021	The SPAR Group Ltd	27,62	1,35
2022	The SPAR Group Ltd	22	1,05
2017	Tiger Brands Limited	18,56	3,4
2018	Tiger Brands Limited	13,88	2,36
2019	Tiger Brands Limited	25,34	1,95
2021	Tiger Brands Limited	12,17	1,63
2022	Tiger Brands Limited	18,42	1,35
	Industrials		
2017	Adcorp Holdings Limited	-7,02	0,97
2018	Adcorp Holdings Limited	-35,25	1,01
2019	Adcorp Holdings Limited	13,77	1,05
2021	Adcorp Holdings Limited	2,83	0,57
2022	Adcorp Holdings Limited	7,89	0,47
2017	Aveng Limited	-110,88	0,3
2018	Aveng Limited	-136,29	0,27
2019	Aveng Limited	-68,7	0,2
2021	Aveng Limited	28,77	0,3
2022	Aveng Limited	3,5	0,26
2017	Barloworld Limited	8,1	0,84
2018	Barloworld Limited	17,3	0,81
2019	Barloworld Limited	10,28	0,76
2021	Barloworld Limited	12,87	0,79

2022	Barloworld Limited	10,8	0,58
2017	Bell Equipment Limited	8,74	0,4
2018	Bell Equipment Limited	8,04	0,44
2019	Bell Equipment Limited	2,2	0,45
2021	Bell Equipment Limited	7,47	0,35
2022	Bell Equipment Limited	10,57	0,39
2017	Brikor Limited	8,26	0,31
2018	Brikor Limited	12,93	0,25
2019	Brikor Limited	12,45	0,27
2021	Brikor Limited	14,87	0,67
2022	Brikor Limited	2,52	1,22
2017	Cognition Holdings Limited	12,75	1,35
2018	Cognition Holdings Limited	13,74	0,78
2019	Cognition Holdings Limited	5,18	1,17
2021	Cognition Holdings Limited	0,95	1,07
2022	Cognition Holdings Limited	-30,32	1,11
2017	Deneb Investments Limited	4,11	0,51
2018	Deneb Investments Limited	0,49	0,55
2019	Deneb Investments Limited	-2,8	0,6
2021	Deneb Investments Limited	7,9	0,46
2022	Deneb Investments Limited	7,41	0,5
2017	enX Group Limited	-17,41	0,81
2018	enX Group Limited	8,19	0,71
2019	enX Group Limited	3,69	0,54
2021	enX Group Limited	11,42	0,39
2022	enX Group Limited	10,35	0,45
2018	Frontier Transport Holdings Limited	17,18	0,56
2019	Frontier Transport Holdings Limited	20,98	0,59
2021	Frontier Transport Holdings Limited	15,85	0,45
2022	Frontier Transport Holdings Limited	18,31	0,51
2017	Grindrod Limited	-4,12	0,79
2018	Grindrod Limited	29,58	0,75
2019	Grindrod Limited	-4,63	0,71
2021	Grindrod Limited	2,04	0,73
2022	Grindrod Limited	6,77	0,68
2017	Hosken Consolidated Investments Limited	7,86	1,18
2018	Hosken Consolidated Investments Limited	6,15	1,14
2019	Hosken Consolidated Investments Limited	4,38	1,03
2021	Hosken Consolidated Investments Limited	-7,92	0,91
2022	Hosken Consolidated Investments Limited	14,51	0,97
2017	Hudaco Industries Limited	17,29	1,91
2018	Hudaco Industries Limited	15,17	1,77
2019	Hudaco Industries Limited	15,64	1,42
2021	Hudaco Industries Limited	17,42	1,34
2022	Hudaco Industries Limited	19,26	1,2
2017	Insimbi Industrial Holdings Limited	9,49	1,05
2018	Insimbi Industrial Holdings Limited	17,92	1,05

2019	Insimbi Industrial Holdings Limited	10,46	0,83
2021	Insimbi Industrial Holdings Limited	8,56	0,73
2022	Insimbi Industrial Holdings Limited	16,92	0,7
2017	Invicta Holdings Limited	12,21	0,98
2018	Invicta Holdings Limited	2,98	0,93
2019	Invicta Holdings Limited	3,12	0,69
2021	Invicta Holdings Limited	8	0,59
2022	Invicta Holdings Limited	21,28	0,74
2017	KAP Industrial Holdings Limited	12,17	1,19
2018	KAP Industrial Holdings Limited	12,67	1,05
2019	KAP Industrial Holdings Limited	8,05	0,81
2021	KAP Industrial Holdings Limited	9,67	0,64
2022	KAP Industrial Holdings Limited	15,14	0,64
2017	Master Drilling Group Limited	12,1	0,72
2018	Master Drilling Group Limited	10	0,55
2019	Master Drilling Group Limited	9,54	0,51
2021	Master Drilling Group Limited	10,54	0,48
2022	Master Drilling Group Limited	12,15	0,53
2017	Metrofile Holdings Limited	21,64	2,72
2018	Metrofile Holdings Limited	21,15	2,15
2019	Metrofile Holdings Limited	1,34	1,36
2021	Metrofile Holdings Limited	24,75	1,73
2022	Metrofile Holdings Limited	23,87	1,64
2017	Murray & Roberts Holdings Limited	0,73	0,46
2018	Murray & Roberts Holdings Limited	3,98	0,58
2019	Murray & Roberts Holdings Limited	5,89	0,51
2021	Murray & Roberts Holdings Limited	-3,63	0,39
2022	Murray & Roberts Holdings Limited	2,38	0,42
2017	Novus Holdings Limited	8,91	0,83
2018	Novus Holdings Limited	2,53	0,43
2019	Novus Holdings Limited	6,43	0,42
2021	Novus Holdings Limited	-1,09	0,17
2022	Novus Holdings Limited	4,42	0,26
2017	Omnia Holdings Limited	7,86	1
2018	Omnia Holdings Limited	8,89	0,9
2019	Omnia Holdings Limited	-5,81	0,55
2021	Omnia Holdings Limited	14,2	0,59
2022	Omnia Holdings Limited	13,53	0,75
2017	Primeserv Group Limited	13,99	0,62
2018	Primeserv Group Limited	14,94	0,55
2019	Primeserv Group Limited	15,33	0,47
2021	Primeserv Group Limited	9,29	0,51
2022	Primeserv Group Limited	8,68	0,6
2017	Raubex Group Limited	9,8	0,89
2018	Raubex Group Limited	10,48	0,73
2019	Raubex Group Limited	1,43	0,62
2021	Raubex Group Limited	3,59	0,68

2022	Raubex Group Limited	11,51	0,9
2017	Reunert Limited	15,58	1,4
2018	Reunert Limited	15,57	1,55
2019	Reunert Limited	10,8	1,45
2021	Reunert Limited	11,61	1,06
2022	Reunert Limited	11,72	0,89
2017	Santova Limited	17,52	1,19
2018	Santova Limited	17,12	0,97
2019	Santova Limited	12,17	0,89
2021	Santova Limited	11,26	0,74
2022	Santova Limited	22,21	0,83
2017	South Ocean Holdings Limited	-12,15	0,16
2018	South Ocean Holdings Limited	-0,75	0,3
2019	South Ocean Holdings Limited	-3,37	0,22
2021	South Ocean Holdings Limited	13,23	0,39
2022	South Ocean Holdings Limited	7,8	0,3
2017	Stefanutti Stocks Holdings Limited	-5,62	0,27
2018	Stefanutti Stocks Holdings Limited	-26,72	0,18
2019	Stefanutti Stocks Holdings Limited	-6,34	0,17
2021	Stefanutti Stocks Holdings Limited	-81,41	0,31
2017	Super Group Limited	11,88	1,2
2018	Super Group Limited	11,75	1,02
2019	Super Group Limited	11,88	0,91
2021	Super Group Limited	8,77	0,88
2022	Super Group Limited	10,09	0,82
2017	The Bidvest Group Limited	21,98	1,42
2018	The Bidvest Group Limited	15,94	1,62
2019	The Bidvest Group Limited	14,74	1,53
2021	The Bidvest Group Limited	15,06	1,64
2022	The Bidvest Group Limited	17,88	1,57
2017	Trellidor Holdings Limited	34,35	2,89
2018	Trellidor Holdings Limited	27,65	2,32
2019	Trellidor Holdings Limited	19,41	2,01
2021	Trellidor Holdings Limited	22,57	1,56
2022	Trellidor Holdings Limited	0,25	1,25
2017	Trencor Limited	-4,55	0,74
2018	Trencor Limited	45,71	0,74
2019	Trencor Limited	-21,45	0,68
2021	Trencor Limited	0,5	0,66
2022	Trencor Limited	0,23	0,79
2017	Wilson Bayly Holmes-Ovcon Limited	13,62	0,57
2018	Wilson Bayly Holmes-Ovcon Limited	14,04	0,51
2019	Wilson Bayly Holmes-Ovcon Limited	8,49	0,37
2021	Wilson Bayly Holmes-Ovcon Limited	5,72	0,41
2022	Wilson Bayly Holmes-Ovcon Limited	-75,67	0,44
2017	Workforce Holdings Limited	18,12	0,76
2018	Workforce Holdings Limited	17,48	0,9

2019	Workforce Holdings Limited	13,77	0,74
2021	Workforce Holdings Limited	11,34	0,64
2022	Workforce Holdings Limited	11,61	0,65

APPENDIX D: SUSTAINABILITY PERFORMANCE – ALL COMPANIES

	Before COVID-19
	After COVID-19

Year	Basic materials	E-score	S-score	G-score	ESG score
2017	AECI Ltd	47,39	67,04	63,97	58,26
2018	AECI Ltd	47,05	66,89	63,18	57,84
2019	AECI Ltd	45,93	66,83	63,35	57,43
2021	AECI Ltd	46,44	67,19	64,14	57,97
2022	AECI Ltd	53,5	68,26	64,95	61,36
2017	African Rainbow Minerals Limited	47,76	70,3	61,66	58,69
2018	African Rainbow Minerals Limited	49,08	70,38	60,52	58,9
2019	African Rainbow Minerals Limited	46,18	70,05	61	57,78
2021	African Rainbow Minerals Limited	46,58	70,8	61,76	58,4
2017	Afrimat Limited	53,94	75,22	64,29	63,43
2018	Afrimat Limited	53,83	75,28	63,62	63,2
2019	Afrimat Limited	52,74	75,15	63,71	62,75
2021	Afrimat Limited	53,37	75,97	64,47	63,48
2022	Afrimat Limited	41,51	76,49	65,28	59,14
2017	Anglo American Platinum Limited	21,91	72,09	62,69	49,2
2018	Anglo American Platinum Limited	21,91	72,09	62,69	49,2
2019	Anglo American Platinum Limited	21,91	66,77	63,1	47,72

2021	Anglo American Platinum Limited	42,8	67,64	63,77	56,54
2022	Anglo American Platinum Limited	50,13	68,11	64,71	59,9
2017	ArcelorMittal South Africa Ltd	48,28	70,67	66,52	60,47
2018	ArcelorMittal South Africa Ltd	48,5	70,57	65,67	60,27
2019	ArcelorMittal South Africa Ltd	46,74	70,63	65,76	59,61
2021	ArcelorMittal South Africa Ltd	47,33	71,27	66,71	60,33
2022	ArcelorMittal South Africa Ltd	54,45	71,72	67,57	63,57
2017	Argent Industrial Limited	48,25	70,76	66,53	60,49
2018	Argent Industrial Limited	48,02	70,69	65,66	60,11
2019	Argent Industrial Limited	19,27	66,6	71,93	49,27
2021	Argent Industrial Limited	46,71	71,27	66,5	60,02
2022	Argent Industrial Limited	55,42	71,96	67,4	63,98
2017	Hulamin Limited	49,78	68,07	60,54	58,5
2018	Hulamin Limited	49,75	67,94	59,78	58,21
2019	Hulamin Limited	48,17	67,83	59,92	57,59
2021	Hulamin Limited	48,66	68,75	60,67	58,29
2022	Hulamin Limited	56,08	69,13	61,55	61,64
2017	Impala Platinum Holdings Limited	44,68	67,17	63,7	57,13
2018	Impala Platinum Holdings Limited	21,91	72,09	36,7	41,4
2019	Impala Platinum Holdings Limited	45,33	67,2	62,68	57,09
2021	Impala Platinum Holdings Limited	42,89	67,78	63,79	56,63
2022	Impala Platinum Holdings Limited	50,06	68,24	64,59	59,87

2017	Kumba Iron Ore Limited	47,94	70,65	66,48	60,32
2018	Kumba Iron Ore Limited	47,55	70,49	65,74	59,89
2019	Kumba Iron Ore Limited	46,29	70,47	65,92	59,43
2021	Kumba Iron Ore Limited	46,57	71,35	66,67	60,03
2022	Kumba Iron Ore Limited	53,55	71,74	67,65	63,24
2017	Merafe Resources Limited	47,52	70,19	61,77	58,59
2018	Merafe Resources Limited	47,31	70,2	61,02	58,29
2019	Merafe Resources Limited	45,94	70,05	61,25	57,77
2021	Merafe Resources Limited	46,15	70,79	61,9	58,27
2022	Merafe Resources Limited	53,49	71,3	62,61	61,57
2021	Northam Platinum Holdings Limited	42,89	67,82	63,87	56,66
2022	Northam Platinum Holdings Limited	50,11	68,36	64,67	59,95
2017	PPC Ltd	51,84	75,37	64,28	62,63
2018	PPC Ltd	53,2	75,06	63,48	62,84
2019	PPC Ltd	52,38	75,14	63,69	62,6
2021	PPC Ltd	53,78	75,7	64,49	63,57
2022	PPC Ltd	41,51	76,3	65,14	59,04
2017	Royal Bafokeng Platinum Limited	44,4	67,16	63,6	56,99
2018	Royal Bafokeng Platinum Limited	41,43	67,29	62,77	55,59
2019	Royal Bafokeng Platinum Limited	41,24	66,76	62,8	55,36
2021	Royal Bafokeng Platinum Limited	42,81	67,78	63,82	56,61

2022	Royal Bafokeng Platinum Limited	50,4	68,1	64,63	59,98
2017	Sappi Limited	48,57	66,65	64,86	58,88
2018	Sappi Limited	48,18	66,58	64,11	58,48
2019	Sappi Limited	43,76	67,23	64,39	56,99
2021	Sappi Limited	44,93	66,8	64,59	57,39
2022	Sappi Limited	54,1	67,26	65,49	61,47
2017	Sasol Limited	46,49	66,97	64,14	57,93
2018	Sasol Limited	46,07	66,93	63,28	57,49
2019	Sasol Limited	44,25	66,87	63,34	56,76
2021	Sasol Limited	45,84	67,61	64,1	57,85
2022	Sasol Limited	53,18	68,26	64,94	61,23
2017	Sephaku Holdings Limited	53,93	75,32	64,39	63,48
2018	Sephaku Holdings Limited	53,76	75,35	63,53	63,17
2019	Sephaku Holdings Limited	52,55	75,24	63,68	62,7
2021	Sephaku Holdings Limited	52,98	76,03	64,44	63,33
2022	Sephaku Holdings Limited	60,29	76,56	65,25	66,66
2019	Sibanye Stillwater Limited	38,05	69,01	59,28	53,71
2021	Sibanye Stillwater Limited	49,06	72	62,23	59,89
2022	Sibanye Stillwater Limited	56,84	72,24	63,17	63,36
2017	Wesizwe Platinum Limited	49,26	71,36	62,11	59,74
2018	Wesizwe Platinum Limited	48,75	69,17	60,97	58,54
2019	Wesizwe Platinum Limited	44,91	69,11	60,76	56,93

2021	Wesizwe Platinum Limited	54,71	68,54	62,69	61,25
2017	York Timber Holdings Limited	44,11	63,77	62,19	55,43
2018	York Timber Holdings Limited	43,6	63,64	61,3	54,92
2019	York Timber Holdings Limited	42,67	63,79	61,55	54,67
2021	York Timber Holdings Limited	42,82	64,41	62,19	55,11
2022	York Timber Holdings Limited	49,66	65,25	63,02	58,35
	Communication				
2017	African Media Entertainment Limited	40,75	69,88	63,44	62,12
2018	African Media Entertainment Limited	40,59	69,82	62,67	61,83
2019	African Media Entertainment Limited	39,02	69,67	62,91	61,51
2021	African Media Entertainment Limited	39,91	63,27	63,04	58,53
2022	African Media Entertainment Limited	46,97	71,14	64,37	64,27
2017	Blue Label Telecoms Limited	39,51	68,08	64,71	61,35
2018	Blue Label Telecoms Limited	39,53	67,95	63,89	61,04
2019	Blue Label Telecoms Limited	39,1	67,77	63,98	60,9
2021	Blue Label Telecoms Limited	38,17	68,63	64,69	61,36
2022	Blue Label Telecoms Limited	43,11	68,87	65,98	62,86
2017	Caxton and CTP Publishers and Printers Limited	40,3	73,62	65,68	64,57

2018	Caxton and CTP Publishers and Printers Limited	40,32	73,62	64,92	64,35
2019	Caxton and CTP Publishers and Printers Limited	38,68	74,02	65,14	64,29
2021	Caxton and CTP Publishers and Printers Limited	38,92	74,87	65,86	64,98
2022	Caxton and CTP Publishers and Printers Limited	46,69	75,24	66,8	67
2017	eMedia Holdings Limited	44,53	73,07	65,48	65,08
2018	eMedia Holdings Limited	42,54	72,53	64,96	64,26
2019	eMedia Holdings Limited	44,23	72,62	64,87	64,62
2021	eMedia Holdings Limited	43,25	73,49	65,66	65,09
2022	eMedia Holdings Limited	50,58	74,28	66,37	67,17
2017	Huge Group Limited	39,76	67,15	64,84	60,98
2018	Huge Group Limited	38,71	67,93	63,93	60,88
2019	Huge Group Limited	37,55	67,86	64,19	60,7
2021	Huge Group Limited	38,36	68,79	64,89	61,54
2022	Huge Group Limited	45,86	69,7	65,71	63,73
2017	MTN Group Limited	39,28	67,77	64,84	61,19
2018	MTN Group Limited	39	67,71	64,06	60,87
2019	MTN Group Limited	38,51	67,32	64,12	60,6
2021	MTN Group Limited	38,49	67,98	64,79	61,12
2022	MTN Group Limited	21,98	68,63	65,65	58,41
2019	MultiChoice Group Limited	30,79	73,12	64,74	62,14

2021	MultiChoice Group Limited	43,78	73,31	65,69	65,12
2022	MultiChoice Group Limited	30,79	74	66,26	63,04
2017	Naspers Limited	40,31	68,18	63,04	61,06
2018	Naspers Limited	40,1	68,06	61,9	60,62
2019	Naspers Limited	42,27	67,71	62,02	60,91
2021	Naspers Limited	45,17	69,02	63,1	62,48
2022	Naspers Limited	29,26	69,49	63,78	59,73
2017	TeleMasters Holdings Limited	39,4	68,07	64,82	61,36
2018	TeleMasters Holdings Limited	38,79	67,91	63,91	60,89
2019	TeleMasters Holdings Limited	37,34	67,73	64,1	60,56
2021	TeleMasters Holdings Limited	38,46	68,8	64,94	61,57
2022	TeleMasters Holdings Limited	45,51	69,37	65,77	63,52
2017	Telkom SA SOC Limited	21,98	72,41	63,72	59,72
2018	Telkom SA SOC Limited	21,98	72,41	63,72	59,72
2019	Telkom SA SOC Limited	21,98	72,41	63,72	59,72
2021	Telkom SA SOC Limited	37,52	68,76	64,96	61,37
2022	Telkom SA SOC Limited	46,02	69,23	65,64	63,51
2017	Vodacom Group Limited	38,98	68,11	65	61,35
2018	Vodacom Group Limited	39,04	67,95	64,02	60,99
2019	Vodacom Group Limited	38,03	67,8	64,18	60,76
2021	Vodacom Group Limited	37,86	68,72	64,95	61,42
2022	Vodacom Group Limited	45,79	69,27	65,74	63,51

	Consumer cyclical				
2017	Bowler Metcalf Limited	48,98	75,37	66,07	64,66
2018	Bowler Metcalf Limited	30,71	81,23	63,62	60,79
2019	Bowler Metcalf Limited	30,71	81,23	63,62	60,79
2021	Bowler Metcalf Limited	42,91	72,93	65,65	61,74
2022	Bowler Metcalf Limited	30,71	73,61	66,41	58,58
2017	Calgro M3 Holdings Limited	44,53	68,43	63,61	59,81
2018	Calgro M3 Holdings Limited	44,22	68,29	62,81	59,42
2019	Calgro M3 Holdings Limited	36,89	66,67	61,36	56,14
2021	Calgro M3 Holdings Limited	43,65	69,03	63,53	59,77
2022	Calgro M3 Holdings Limited	50,62	69,6	64,48	62,37
2017	Cashbuild Limited	40,6	70,27	65,35	59,89
2018	Cashbuild Limited	40,21	70,17	64,52	59,49
2019	Cashbuild Limited	38,92	70,16	64,6	59,12
2021	Cashbuild Limited	39,5	70,81	65,29	59,76
2022	Cashbuild Limited	46,51	71,3	66,13	62,31
2017	City Lodge Hotels Limited	39,9	69,17	67,17	59,79
2018	City Lodge Hotels Limited	39,5	68,89	66,41	59,33
2019	City Lodge Hotels Limited	38,08	69,11	66,56	59,03
2021	City Lodge Hotels Limited	38,74	69,87	67,07	59,69
2022	City Lodge Hotels Limited	46,26	70,45	67,9	62,43
2017	Combined Motor Holdings Limited	43,13	70,31	66,04	60,87

2018	Combined Motor Holdings Limited	42,92	70,25	65,23	60,54
2019	Combined Motor Holdings Limited	41,74	70,24	65,35	60,22
2021	Combined Motor Holdings Limited	41,75	70,91	66,12	60,72
2022	Combined Motor Holdings Limited	24,83	71,52	66,87	56,12
2017	Famous Brands Limited	41,03	69,04	66,13	59,77
2018	Famous Brands Limited	40,58	67,71	65,11	58,79
2019	Famous Brands Limited	39,56	68,88	65,44	59,05
2022	Famous Brands Limited	47,1	70,16	67,04	62,31
2017	Grand Parade Investments Limited	21,15	68,48	65,98	53,53
2018	Grand Parade Investments Limited	47,36	69,79	62,66	60,92
2019	Grand Parade Investments Limited	40,94	68,21	65,11	59,1
2021	Grand Parade Investments Limited	39,92	69,89	66,23	59,8
2022	Grand Parade Investments Limited	37,23	65,86	66,21	57,38
2017	HomeChoice International plc	40,82	69,5	67,34	60,25
2018	HomeChoice International plc	40,29	69,29	66,46	59,74
2019	HomeChoice International plc	39,25	69,39	66,67	59,53
2021	HomeChoice International plc	39,5	70,11	67,37	60,1
2022	HomeChoice International plc	47,05	70,64	68,21	62,83
2017	Italtile Limited	39,9	70,26	65,32	59,67

2018	Italtile Limited	39,62	70,16	64,62	59,34
2019	Italtile Limited	38,39	70,19	64,81	59,04
2021	Italtile Limited	38,09	70,86	65,88	59,53
2022	Italtile Limited	46,6	71,43	66,19	62,41
2017	Lewis Group Limited	41,43	69,26	67,28	60,32
2018	Lewis Group Limited	40,04	69,08	66,28	59,53
2019	Lewis Group Limited	40,08	68,73	66,57	59,49
2021	Lewis Group Limited	40,15	69,78	67,34	60,16
2022	Lewis Group Limited	47,53	70,33	68,17	62,84
2017	Metair Investments Limited	44,91	68,13	65,96	60,51
2018	Metair Investments Limited	44,36	68,13	65,13	60,1
2019	Metair Investments Limited	43,16	68,04	65,33	59,76
2021	Metair Investments Limited	43,74	68,64	66,17	60,43
2022	Metair Investments Limited	52,75	66,92	64,75	62,02
2019	Motus Holdings Limited	43,47	68,01	65,29	59,83
2021	Motus Holdings Limited	43,7	68,82	66	60,44
2022	Motus Holdings Limited	51,05	69,38	66,84	63,12
2017	Mpact Limited	30,71	81,23	65,7	61,41
2018	Mpact Limited	45,15	72,49	64,81	61,99
2019	Mpact Limited	44,13	72,54	65,07	61,77
2021	Mpact Limited	44,29	73,26	65,79	62,33
2022	Mpact Limited	51,48	73,77	66,66	64,95

2017	Mr Price Group Limited	39,97	70,39	66,34	60,05
2018	Mr Price Group Limited	40,31	70,35	65,42	59,86
2019	Mr Price Group Limited	38,94	70,24	65,55	59,44
2021	Mr Price Group Limited	39,75	71,13	66,35	60,28
2022	Mr Price Group Limited	46,9	71,61	67,17	62,87
2017	Nampak Limited	45,51	72,39	65,55	62,28
2018	Nampak Limited	45,57	72,47	64,81	62,1
2019	Nampak Limited	38,39	69,8	62,73	58,25
2021	Nampak Limited	44,87	71,81	65,84	61,94
2022	Nampak Limited	50,79	74,65	66,41	65,02
2017	Nictus Limited	20,55	74,88	66,97	56,21
2018	Nictus Limited	20,55	74,88	66,97	56,21
2019	Nictus Limited	39,87	68	66,15	59
2021	Nictus Limited	39,58	68,42	66,64	59,24
2022	Nictus Limited	55,77	75,8	65,43	66,68
2017	Pepkor Holdings Limited	38,2	73,76	65,6	60,64
2018	Pepkor Holdings Limited	37,9	73,82	64,75	60,32
2019	Pepkor Holdings Limited	37,1	73,49	65,06	60,04
2021	Pepkor Holdings Limited	37,09	74,33	65,66	60,56
2022	Pepkor Holdings Limited	44,49	74,83	66,48	63,22
2017	Pick n Pay Stores Limited	37,9	73,63	65,69	60,53
2018	Pick n Pay Stores Limited	37,41	73,54	64,69	60,04

2019	Pick n Pay Stores Limited	36,82	73,49	65,02	59,95
2021	Pick n Pay Stores Limited	37,1	74,14	65,66	60,49
2022	Pick n Pay Stores Limited	44,24	74,7	66,48	63,1
2017	Shoprite Holdings Limited	38,38	73,61	65,55	60,62
2018	Shoprite Holdings Limited	37,89	73,4	64,75	60,16
2019	Shoprite Holdings Limited	37,22	73,55	65,04	60,1
2021	Shoprite Holdings Limited	37,09	74,19	65,67	60,51
2022	Shoprite Holdings Limited	44,21	74,76	66,51	63,12
2017	Spur Corporation Ltd	40,56	68,93	66,03	59,55
2018	Spur Corporation Ltd	40,58	68,78	65,33	59,29
2019	Spur Corporation Ltd	39,46	68,8	65,34	58,96
2021	Spur Corporation Ltd	39,83	69,56	66,06	59,6
2022	Spur Corporation Ltd	47,45	70,11	66,86	62,34
2017	Steinhoff International Holdings N.V.	40,66	69,42	67,2	60,13
2018	Steinhoff International Holdings N.V.	40,57	68,46	66,27	59,44
2019	Steinhoff International Holdings N.V.	39,16	69,66	66,64	59,6
2021	Steinhoff International Holdings N.V.	39,57	70,31	67,35	60,2
2022	Steinhoff International Holdings N.V.	46,7	70,76	68,22	62,78
2017	Sun International Limited	43,74	70,48	65,04	60,83

2018	Sun International Limited	31,05	86,95	66,54	64,06
2019	Sun International Limited	41,02	70,22	63,95	59,58
2021	Sun International Limited	41,29	71,02	64,67	60,2
2022	Sun International Limited	48,37	71,65	65,56	62,84
2017	The Foschini Group Limited	40,17	69,37	67,26	59,97
2018	The Foschini Group Limited	40,93	68,99	66,55	59,84
2019	The Foschini Group Limited	39,13	69,37	66,66	59,48
2021	The Foschini Group Limited	39,57	70,25	67,37	60,18
2022	The Foschini Group Limited	46,79	70,58	68,2	62,73
2017	Transpaco Limited	43,03	72,53	66,29	61,81
2018	Transpaco Limited	45,43	72,64	64,81	62,13
2019	Transpaco Limited	43,97	72,58	64,96	61,71
2021	Transpaco Limited	44,25	73,39	65,73	62,35
2022	Transpaco Limited	51,99	73,84	66,53	65,09
2017	Truworths International Limited	40,66	70,53	66,26	60,29
2018	Truworths International Limited	40,26	70,46	65,43	59,89
2019	Truworths International Limited	39,22	70,35	65,61	59,59
2021	Truworths International Limited	39,45	71,18	66,35	60,21
2022	Truworths International Limited	46,85	71,71	67,18	62,89
2017	Tsogo Sun Gaming Limited	42,36	70,57	64,58	60,31
2018	Tsogo Sun Gaming Limited	42,05	70,48	63,75	59,93
2019	Tsogo Sun Gaming Limited	41,03	70,34	63,93	59,63

2021	Tsogo Sun Gaming Limited	42,47	70,13	64,46	60,13
2022	Tsogo Sun Gaming Limited	48,7	71,7	65,44	62,92
2017	Woolworths Holdings Limited	38,33	73,67	65,64	60,66
2018	Woolworths Holdings Limited	37,82	73,67	64,88	60,28
2019	Woolworths Holdings Limited	36,75	73,44	65,05	59,92
2021	Woolworths Holdings Limited	36,76	74,22	65,61	60,4
2022	Woolworths Holdings Limited	44,44	74,75	66,49	63,18
	Consumer defensive				
2017	ADvTECH Limited	41,71	71,58	64,85	60,6
2018	ADvTECH Limited	41,76	71,49	63,99	60,32
2019	ADvTECH Limited	40,6	71,39	64,15	59,98
2021	ADvTECH Limited	41,11	72,26	64,82	60,68
2022	ADvTECH Limited	48,18	72,78	65,67	63,26
2017	AH-Vest Limited	44,56	68,89	66,39	60,84
2018	AH-Vest Limited	42,31	69,29	65,34	60,01
2019	AH-Vest Limited	42,05	68,96	65,36	59,81
2021	AH-Vest Limited	42,66	69,89	66,25	60,63
2022	AH-Vest Limited	49,1	70,39	66,75	62,91
2017	Astral Foods Limited	46,48	66,22	64,55	59,8
2018	Astral Foods Limited	46,04	66,12	63,79	59,4
2019	Astral Foods Limited	44,41	66,02	64,06	58,95
2021	Astral Foods Limited	46,05	66,94	64,59	59,97

2022	Astral Foods Limited	52,57	67,39	65,48	62,37
2017	AVI Limited	43,59	69,18	66,26	60,62
2018	AVI Limited	42,99	69,27	65,42	60,23
2019	AVI Limited	41,9	69,19	65,6	59,92
2021	AVI Limited	42,18	70,03	66,31	60,56
2022	AVI Limited	50,81	70,62	67,18	63,64
2017	Bid Corporation Limited	48,17	72,49	66,05	63,26
2018	Bid Corporation Limited	47,98	71,93	65,27	62,75
2019	Bid Corporation Limited	43,51	73,19	65,58	62
2021	Bid Corporation Limited	43,67	74,03	66,28	62,6
2022	Bid Corporation Limited	50,85	74,64	67,12	65,24
2017	Crookes Brothers Limited	46,14	66,17	64,56	59,68
2018	Crookes Brothers Limited	47,37	66	64,02	59,82
2019	Crookes Brothers Limited	42,77	66,03	64,03	58,45
2021	Crookes Brothers Limited	45,73	66,82	64,6	59,83
2022	Crookes Brothers Limited	32,34	67,31	65,45	56,26
2017	Curro Holdings Limited	41,56	71,31	64,78	60,43
2018	Curro Holdings Limited	40,52	71,24	64,97	60,14
2019	Curro Holdings Limited	41,26	71,09	63,69	59,92
2021	Curro Holdings Limited	42,08	71,52	64,49	60,58
2022	Curro Holdings Limited	49,51	72,15	65,4	63,33
2017	Kaap Agri Limited	46,34	66,29	64,58	59,79

2018	Kaap Agri Limited	46,33	66,25	63,77	59,53
2019	Kaap Agri Limited	45,09	66,2	63,96	59,19
2021	Kaap Agri Limited	45,53	66,93	64,62	59,82
2022	Kaap Agri Limited	52,5	66,23	65,66	61,94
2018	Libstar Holdings Limited	42,85	69,12	65,37	60,12
2019	Libstar Holdings Limited	40,86	68,96	65,57	59,51
2021	Libstar Holdings Limited	43,16	69,98	66,19	60,8
2022	Libstar Holdings Limited	48,47	74,13	67,67	64,49
2017	Oceana Group Limited	43,39	69,29	66,15	60,57
2018	Oceana Group Limited	43,12	69,21	65,36	60,23
2019	Oceana Group Limited	44,43	69,3	66,25	60,92
2021	Oceana Group Limited	41,14	70,28	66,32	60,35
2022	Oceana Group Limited	49,75	70,44	67,15	63,24
2017	Quantum Foods Holdings Ltd	46,35	66,21	64,51	59,74
2018	Quantum Foods Holdings Ltd	46,03	66,1	63,72	59,36
2019	Quantum Foods Holdings Ltd	44,73	66,13	63,95	59,05
2021	Quantum Foods Holdings Ltd	45,58	66,75	64,58	59,75
2022	Quantum Foods Holdings Ltd	52,2	67,38	65,3	62,21
2017	RCL Foods Limited	43,16	69,31	66,17	60,53
2018	RCL Foods Limited	42,96	69,23	65,33	60,18
2019	RCL Foods Limited	25,84	69,03	65,68	55,07
2021	RCL Foods Limited	41,47	70,26	66,23	60,41

2022	RCL Foods Limited	49,32	70,51	67,07	63,12
2017	RFG Holdings Limited	42,85	69,37	66,36	60,51
2018	RFG Holdings Limited	42,44	69,27	65,49	60,09
2019	RFG Holdings Limited	41,72	69,18	65,58	59,86
2021	RFG Holdings Limited	42,03	69,9	66,26	60,45
2022	RFG Holdings Limited	49,42	70,6	67,16	63,22
2017	Stadio Holdings Limited	48,96	76,14	66,56	65,11
2018	Stadio Holdings Limited	41,73	71,21	63,81	60,15
2019	Stadio Holdings Limited	40,57	71,31	64,01	59,9
2021	Stadio Holdings Limited	40,69	72,28	64,75	60,55
2022	Stadio Holdings Limited	49,08	72,84	65,45	63,49
2017	The SPAR Group Ltd	46,03	74,09	67,14	63,59
2018	The SPAR Group Ltd	44,6	73,34	65,35	62,32
2019	The SPAR Group Ltd	43,35	73,24	65,5	61,95
2021	The SPAR Group Ltd	43,61	74,08	66,29	62,6
2022	The SPAR Group Ltd	50,97	74,58	67,11	65,25
2017	Tiger Brands Limited	42,86	69,33	66,33	60,49
2018	Tiger Brands Limited	40,9	69,19	64,54	59,31
2019	Tiger Brands Limited	41,91	69,17	65,58	59,92
2021	Tiger Brands Limited	41,85	69,96	66,31	60,43
2022	Tiger Brands Limited	49,87	70,42	67,01	63,23
	Industrials				

2017	Adcorp Holdings Limited	43,14	70,3	65,01	57,85
2018	Adcorp Holdings Limited	42,62	70,08	64,11	57,3
2019	Adcorp Holdings Limited	41,59	70	64,3	56,92
2021	Adcorp Holdings Limited	41,59	70,71	65,06	57,37
2022	Adcorp Holdings Limited	49,27	71,3	65,89	60,86
2017	Aveng Limited	48,32	67,06	65,36	59,05
2018	Aveng Limited	48,16	67,05	64,6	58,76
2019	Aveng Limited	46,9	66,88	64,78	58,26
2021	Aveng Limited	46,68	67,65	65,54	58,63
2022	Aveng Limited	52,72	67,88	66,29	61,34
2017	Barloworld Limited	42,4	68,19	63,78	56,55
2018	Barloworld Limited	41,95	68,53	63,06	56,25
2019	Barloworld Limited	41,64	68,2	63,32	56,11
2021	Barloworld Limited	41,1	68,97	63,9	56,3
2022	Barloworld Limited	48,25	69,41	64,67	59,52
2017	Bell Equipment Limited	41,94	68,76	64,88	56,87
2018	Bell Equipment Limited	42,43	68,33	64,43	56,8
2019	Bell Equipment Limited	41,78	68,35	64,62	56,6
2021	Bell Equipment Limited	41,69	69,25	65,34	57,05
2022	Bell Equipment Limited	49,07	69,82	66,18	60,43
2017	Brikor Limited	45,03	69,57	65,64	58,58
2018	Brikor Limited	47,11	69,57	64,81	59,15

2019	Brikor Limited	46,14	69,4	64,92	58,75
2021	Brikor Limited	42,1	69,68	65,94	57,53
2022	Brikor Limited	34,46	70,88	66,39	54,96
2017	Cognition Holdings Limited	38,12	73,03	65,2	56,72
2018	Cognition Holdings Limited	37,78	72,96	64,3	56,29
2019	Cognition Holdings Limited	45,06	68,48	63,64	57,66
2021	Cognition Holdings Limited	35,86	72,57	65,1	55,65
2022	Cognition Holdings Limited	44,19	74,25	66,09	59,78
2017	Deneb Investments Limited	47,65	69,71	65,59	59,65
2018	Deneb Investments Limited	45,27	69,5	64,48	58,31
2019	Deneb Investments Limited	45,72	69,34	64,89	58,55
2021	Deneb Investments Limited	46,23	70,35	65,67	59,3
2022	Deneb Investments Limited	53,41	70,83	66,55	62,58
2017	enX Group Limited	46,14	68,13	64,71	58,31
2018	enX Group Limited	44,22	68,21	63,85	57,31
2019	enX Group Limited	41,87	68,79	63,76	56,51
2021	enX Group Limited	43,39	68,85	64,76	57,44
2022	enX Group Limited	52,51	69,42	65,26	61,41
2018	Frontier Transport Holdings Limited	43,22	70,33	62,51	57,14
2019	Frontier Transport Holdings Limited	38,79	69,5	61,98	54,96

2021	Frontier Transport Holdings Limited	42,11	70,96	63,19	57,09
2022	Frontier Transport Holdings Limited	49,64	71,5	64,1	60,53
2017	Grindrod Limited	44,15	64,08	63,6	55,96
2018	Grindrod Limited	41,54	62,8	62,35	54,16
2019	Grindrod Limited	40,22	62,85	62,26	53,62
2021	Grindrod Limited	42	63,3	63,45	54,83
2022	Grindrod Limited	45,95	64,4	64,25	56,98
2017	Hosken Consolidated Investments Limited	47,57	69,58	65,6	59,58
2018	Hosken Consolidated Investments Limited	46,51	69,2	64,26	58,64
2019	Hosken Consolidated Investments Limited	49,44	68,72	64,74	59,81
2021	Hosken Consolidated Investments Limited	46,08	70,45	65,65	59,26
2022	Hosken Consolidated Investments Limited	53,8	70,79	66,46	62,7
2017	Hudaco Industries Limited	45,61	73,46	66,24	60,15
2018	Hudaco Industries Limited	45,43	73,4	65,46	59,83
2019	Hudaco Industries Limited	44,2	73,33	65,6	59,36
2021	Hudaco Industries Limited	44,43	74,12	66,34	59,91
2022	Hudaco Industries Limited	51,91	74,63	67,16	63,3
2017	Insimbi Industrial Holdings Limited	44,3	73,71	65,45	59,47

2018	Insimbi Industrial Holdings Limited	44,15	73,64	64,63	59,14
2019	Insimbi Industrial Holdings Limited	43,01	73,51	64,76	58,68
2021	Insimbi Industrial Holdings Limited	43,47	74,37	65,58	59,37
2022	Insimbi Industrial Holdings Limited	50,63	74,87	66,36	62,62
2017	Invicta Holdings Limited	46,29	73	66,18	60,27
2018	Invicta Holdings Limited	45,94	72,78	65,36	59,82
2019	Invicta Holdings Limited	44,93	72,79	65,54	59,47
2021	Invicta Holdings Limited	44,38	74,1	66,28	59,87
2022	Invicta Holdings Limited	51,77	74,65	67,13	63,24
2017	KAP Industrial Holdings Limited	47,02	69,62	65,67	59,4
2018	KAP Industrial Holdings Limited	47,06	69,53	64,85	59,14
2019	KAP Industrial Holdings Limited	45,87	69,46	64,95	58,67
2021	KAP Industrial Holdings Limited	45,83	70,3	65,75	59,15
2022	KAP Industrial Holdings Limited	53,12	70,92	66,57	62,49
2017	Master Drilling Group Limited	48,54	67,12	65,44	59,18
2018	Master Drilling Group Limited	47,74	67	64,66	58,59
2019	Master Drilling Group Limited	48,56	65,77	64,82	58,6
2021	Master Drilling Group Limited	47,03	67,75	65,54	58,8
2022	Master Drilling Group Limited	54,46	68,33	66,38	62,2
2017	Metrofile Holdings Limited	51,48	71,4	64,78	61,44
2018	Metrofile Holdings Limited	51,26	71,39	63,93	61,1
2019	Metrofile Holdings Limited	51,27	70,61	64,02	60,9

2021	Metrofile Holdings Limited	50,45	72,1	64,8	61,25
2022	Metrofile Holdings Limited	57,99	72,58	65,67	64,67
2017	Murray & Roberts Holdings Limited	47,65	66,24	65,23	58,5
2018	Murray & Roberts Holdings Limited	47,92	66,87	64,56	58,6
2019	Murray & Roberts Holdings Limited	46,83	66,74	64,64	58,14
2021	Murray & Roberts Holdings Limited	35,1	65,98	67,54	54,09
2022	Murray & Roberts Holdings Limited	53,68	68,32	66,28	61,85
2017	Novus Holdings Limited	51,13	71,33	64,85	61,3
2018	Novus Holdings Limited	50,94	71,14	63,92	60,9
2019	Novus Holdings Limited	51,56	70,71	63,96	61,02
2021	Novus Holdings Limited	51,01	72,55	64,74	61,59
2022	Novus Holdings Limited	57,73	72,45	65,49	64,48
2017	Omnia Holdings Limited	45,52	69,38	65,9	58,79
2018	Omnia Holdings Limited	47,03	69,51	64,77	59,1
2019	Omnia Holdings Limited	46,12	69,58	64,99	58,82
2021	Omnia Holdings Limited	46,03	70,31	65,65	59,2
2022	Omnia Holdings Limited	53,52	70,77	66,45	62,57
2017	Primeserv Group Limited	42,97	70,17	65,01	57,74
2018	Primeserv Group Limited	42,54	70,22	64,18	57,34

2019	Primeserv Group Limited	47,63	74,43	63,56	60,45
2021	Primeserv Group Limited	41,65	70,79	65	57,4
2022	Primeserv Group Limited	48,78	71,23	65,8	60,62
2017	Raubex Group Limited	47,33	66,89	65,52	58,66
2018	Raubex Group Limited	47,55	66,82	64,72	58,48
2019	Raubex Group Limited	45,65	66,49	64,7	57,62
2021	Raubex Group Limited	46,37	67,4	65,4	58,39
2022	Raubex Group Limited	52,63	67,87	66,64	61,41
2017	Reunert Limited	43,59	69,77	65,56	58,03
2018	Reunert Limited	42,77	69,73	64,77	57,46
2019	Reunert Limited	41,95	69,65	64,96	57,16
2021	Reunert Limited	39,31	69,72	65,58	56,31
2022	Reunert Limited	48,79	71,16	66,56	60,83
2017	Santova Limited	42,4	63,51	63,57	55,08
2018	Santova Limited	42,07	63,42	62,76	54,68
2019	Santova Limited	41,08	63,35	62,96	54,32
2021	Santova Limited	41,29	64,17	63,67	54,87
2022	Santova Limited	48,97	64,71	64,57	58,37
2017	South Ocean Holdings Limited	41,82	69,39	65,08	57,07
2018	South Ocean Holdings Limited	41,95	69,97	64,75	57,2
2019	South Ocean Holdings Limited	42,17	69,63	65,07	57,28
2021	South Ocean Holdings Limited	26,52	70,42	65,69	51,44

2022	South Ocean Holdings Limited	48,89	70,84	66,64	60,8
2017	Stefanutti Stocks Holdings Limited	48,56	67,26	65,4	59,22
2018	Stefanutti Stocks Holdings Limited	45,69	66,47	64,31	57,51
2019	Stefanutti Stocks Holdings Limited	47,18	67,06	64,75	58,41
2021	Stefanutti Stocks Holdings Limited	48,17	67,84	65,34	59,23
2017	Super Group Limited	42,02	63,52	63,66	54,96
2018	Super Group Limited	41,61	63,39	62,77	54,49
2019	Super Group Limited	40,73	63,35	63,03	54,21
2021	Super Group Limited	40,07	64,14	63,79	54,4
2022	Super Group Limited	48,45	64,75	64,47	58,14
2017	The Bidvest Group Limited	46,67	69,38	65,2	59,04
2018	The Bidvest Group Limited	46,87	69,56	64,82	59,06
2019	The Bidvest Group Limited	46,24	69,24	64,92	58,75
2021	The Bidvest Group Limited	46,2	70,28	65,65	59,26
2022	The Bidvest Group Limited	53,63	70,81	66,49	62,64
2017	Trellidor Holdings Limited	24,61	71,29	65	50,73
2018	Trellidor Holdings Limited	24,61	71,29	65	50,73
2019	Trellidor Holdings Limited	41,27	67,54	65,24	56,34
2021	Trellidor Holdings Limited	41,56	68,53	65,91	56,95
2022	Trellidor Holdings Limited	24,61	68,23	66,21	50,17
2017	Trencor Limited	52,11	72,68	65,89	62,41
2018	Trencor Limited	51,79	72,31	64,97	61,9

2019	Trencor Limited	49,23	71,94	64,97	60,76
2021	Trencor Limited	43,62	80,59	65,12	61,16
2022	Trencor Limited	44,68	66,62	66,44	57,79
2017	Wilson Bayly Holmes-Ovcon Limited	48,38	66,83	65,32	59
2018	Wilson Bayly Holmes-Ovcon Limited	48,14	66,79	64,48	58,64
2019	Wilson Bayly Holmes-Ovcon Limited	47,08	66,59	64,73	58,23
2021	Wilson Bayly Holmes-Ovcon Limited	47,23	67,39	65,37	58,72
2022	Wilson Bayly Holmes-Ovcon Limited	54,43	68,23	66,01	62,04
2017	Workforce Holdings Limited	42,65	69,84	65,14	57,56
2018	Workforce Holdings Limited	42,65	70,12	64,22	57,36
2019	Workforce Holdings Limited	41,58	70,11	64,37	56,97
2021	Workforce Holdings Limited	41,42	70,12	64,9	57,07
2022	Workforce Holdings Limited	49,27	71,13	65,86	60,8

APPENDIX D: ETHICS CERTIFICATE

NWU®
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YUNIBESITI YA BOKONE-BOPHIRIMA

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Web: http://www.nwu.ac.za

Senate Committee for Research Ethics
Tel: 018 299-484
Feziwe.Mseleni@nwu.ac.za

07 July 2023

ETHICS APPROVAL LETTER OF STUDY

Based on approval by the **Economic and Management Sciences Research Ethics Committee (EMS-REC)** on, 30/06/2023 the Economic and Management Sciences Research Ethics Committee hereby **approves** your study as indicated below. This implies that the North-West University Senate Committee for Research Ethics (NWU-REC) grants its permission that, provided the special conditions specified below are met and pending any other authorisation that may be necessary, the study may be initiated, using the ethics number below.

Study title: The impact of COVID-19 on the relationship between sustainability and financial performance: A multi-theoretical interpretation

Study Leader/Supervisor (Principal Investigator)/Researcher): Prof M Oberholzer / Prof S van Rooyen

Student: I Delport (31969178)

N	W	U	-	0	0	7	3	4	-	2	3	-	A	4

Institution   Study Number   Year   Status

Status: S = Submission; R = Re-Submission; P = Provisional Authorisation; A = Authorisation

Application Type:
Commencement date: 07/07/2023   **Risk:** **Minimal**
Expiry date: 07/07/2024

Approval of the study is initially provided for a year, after which continuation of the study is dependent on receipt and review of the annual (or as otherwise stipulated) monitoring report and the concomitant issuing of a letter of continuation.

The EMS-REC would like to remain at your service as scientist and researcher, and wishes you well with your study. Please do not hesitate to contact the EMS-REC or the NWU-SCRE for any further enquiries or requests for assistance.

Yours sincerely,

Mark Rathbone

Digitally signed by Mark Rathbone
DN: cn=Mark Rathbone, o=North-West University, ou=Business management, email=mark.rathbone@nwu.ac.za, c=ZA
Date: 2023.07.10 10:26:20 +02'00'

Prof Mark Rathbone
Chairperson: NWU Economic and Management Sciences Research Ethics Committee

APPENDIX E: LANGUAGE CERTIFICATE

MAGDA BURGER

LANGUAGE PRACTITIONER

[SATI Membership number : 1003227]

75 Munnik Street
STRAND
7140
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2023-11-10

TO WHOM IT MAY CONCERN

LINGUISTIC REVISION OF DISSERTATION

SUBMITTED IN FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE

MASTER OF COMMERCE IN MANAGEMENT ACCOUNTANCY

AT THE NORTH-WEST UNIVERSITY

For

I Delport : Student number: 31969178

I, Magda Burger, ID number 521006 0038 080, hereby declare that I have linguistically revised the dissertation : *The impact of COVID-19 on the relationship between sustainability and financial performance: A multi-theoretical interpretation,* for student I Delport.

Yours sincerely

M.A. Burger

MAGDA BURGER
LANGUAGE PRACTITIONER
BA (Languages) (UFS) (1973); MEd (UFS) (1987)