ANALYSIS OF THE RELATIONSHIP BETWEEN FOREIGN SHAREHOLDING AND ESG PERFORMANCE OF SOUTH AFRICAN LISTED COMPANIES

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"Don't be afraid, for I am with you. Don't be discouraged, for I am your God. I will strengthen you and help you. I will hold you up with my victorious right hand." Isaiah 41:10

ABSTRACT

Given the global movement towards sustainability and the stagnant economic growth of South Africa, this study seeks to determine if there is a relationship between the foreign shareholding percentage of listed companies and the environmental, social and governance (ESG) scores of these companies. Foreign investment has been identified as a driver of economic growth. This study examines the relationship between ESG scores of JSE-listed companies and the percentage of foreign shareholding of these companies from 2015 to 2019. This study relied on ESG data provided by the FTSE Russell. In analysing the data through a generalised linear mixed effects model, this study identified a positive and significant association between the overall ESG, environmental, and social scores and the percentage of foreign shareholding, respectively. Stakeholder theory suggests that companies will determine action based on the interests of all relevant stakeholders. Where foreign shareholders are concerned about ESG performance, companies increase their ESG ratings, taking both their current and future investors into consideration. This study is value-adding in providing evidence for the South African government to mandate a national transition to better ESG practices.

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Brazil, Russia, India, China and South Africa	BRICS
Corporate social responsibility	CSR
Coronavirus disease 2019	COVID-19 / COVID
Environmental, social and governance	ESG
Exchange-traded funds	ETFs
Foreign direct investment	FDI
Foreign portfolio investment	FPI
Generalised linear mixed effects model	GLMM
Global Reporting Initiative	GRI
Gross domestic product	GDP
International Integrated Reporting Framework	<IR> Framework
International Securities Identification Number	ISIN
Johannesburg Stock Exchange	JSE
Organisation for Economic Co-operation and Development	OECD
Socially Responsible Investment Index	SRI Index
South African Rands	ZAR
Standard and Poors	S&P
Sustainable Development Goals	SDGs
United States	US
United States Dollar	USD

CHAPTER 1 - INTRODUCTION

> *"Value is no longer looked at through a financial lens. It is rather looked at through a long-term sustainability lens. How does a company make its money and what are the positive and negative impacts on the triple aspects from its business model? Enhancing the positive impacts and eradicating or ameliorating the negative impacts is part of the value creation process."* (King & Atkins, 2017, p. 79).

The King IV Report defines sustainability as "the ultimate, long-term goal of sustainable development" (Institute of Directors in Southern Africa, 2016, p. 17). It views sustainable development as a holistic approach to considering an organisation's financial and non-financial factors (Institute of Directors in Southern Africa, 2016). Globally, there has been a general trend whereby the market and consumers are becoming aware of the importance of sustainability and the role humans play in the sustainability landscape. From an investor perspective, there has been a shift from profit-focused, traditional investments towards holistic impact investments (Alda, 2019; Jansson & Biel, 2011; Przychodzen J, Gómez-Bezares, Przychodzen W & Larreina, 2016). Environmental, social, and governance factors (ESG) are becoming key for investors in their investing strategies (Matos, 2020). As articulated by Matos (2020), ESG is an evolving field. The numerous ESG reporting frameworks support the growing interest and demand for ESG disclosures (Petersen, Herbert & Daniels, 2022).

This movement has led to considerations in how foreign investment is utilised. Suehrer (2019) proposed impact investing as the future of foreign direct investment (FDI) by implementing investment opportunities such as socially responsible funds. According to the World Investment Report 2020, there has been recent growth in sustainable funds on a global scale, with most sustainable funds being held in Europe, followed by the United States (US) (UNCTAD, 2020). From this, it can be inferred that foreign investors, particularly those of European and US origin, are more driven by sustainability criteria than South African investors.

South Africa has suffered from a recession and requires investment to grow the economy. In 2020, FDI inflows to South Africa declined by 39% compared to the prior year, whereas Southern Africa only experienced a 16% decline in total FDI inflows

(UNCTAD, 2021). In understanding the linkage between foreign investment to South Africa and the attractiveness of ESG for these investments, this study will assess, by way of regression analysis, if there is a relationship between the foreign shareholding percentage of companies listed on the Johannesburg Stock Exchange (JSE) and the ESG scores of these companies. In the pursuit of identifying mechanisms to increase foreign investment to South Africa, the results of this study will provide recommendations on the ESG actions that both companies and the South African government could take to encourage additional foreign investment.

The literature review will be discussed in Chapter 2, followed by the method in Chapter 3. Chapter 4 details and discusses the results obtained. This study combines the equity definitions derived from foreign direct investment and foreign portfolio investment as foreign investment in Chapter 3, 4 and 5, and foreign shareholding percentage of companies is used as a proxy for foreign investment in by this study. Finally, Chapter 5 provides the conclusion and areas for further research.

CHAPTER 2 - LITERATURE REVIEW

The literature review will begin by discussing the development of sustainable investment from the reporting, investor, and marketplace perspectives. This section will then continue to discuss the development of sustainable investment in South Africa. The chapter will then discuss the determinants of the companies' ESG performance to determine what existing factors cause companies to invest in their ESG practices. After that, the chapter will discuss the determinants of foreign investment from a global and South African perspective. Finally, the chapter will identify the relevant theory and establish the research question.

2.1 DEVELOPMENT OF SUSTAINABLE INVESTMENT

Sustainable investment is an approach to investing that considers various factors, focusing on ESG (FTSE Russell, 2020; Matos, 2020). This broad definition encompasses many investor profiles, each with varying investment strategies concerning ESG (Roundy, Holzhauer & Dai, 2017). Existing literature reveals that investors are altering their behaviour to consider ESG criteria (Alda, 2019; Jansson & Biel, 2011; Przychodzen et al., 2016). The investor market has adapted to include sustainability-themed funds and indices (UNCTAD, 2021). Furthermore, the emphasis on sustainability reporting has increased significantly, specifically for publicly listed entities (UNCTAD, 2021).

The 2030 Agenda for Sustainable Development identifies 17 Sustainable Development Goals (SDGs) that seek to overcome significant barriers to People, Planet, Prosperity and Peace (United Nations, 2015). These goals contribute towards organisations employing sustainable practices in their pursuit of achieving these goals. ESG data provides insight into how organisations are performing in terms of their sustainability performance (Khaled, Ali & Mohamed, 2021). In their study, Khaled et al. (2021) identified that ESG indicators underpin some of the SDGs, with a total of 40 of 169 SDG targets relating to ESG. As such, it appears that there is an inter-connected relationship between ESG, SDGs and sustainability.

2.1.1 The reporting perspective

The company's reporting environment should be understood to appreciate the motive behind a company's actions concerning its ESG practices. The legislative environment

may govern the depth of disclosure and types of ESG practices that companies engage with. Several reporting bodies exist to assist companies in preparing sustainability reports. This guidance is either multi-stakeholder focussed, such as the Global Reporting Initiative (GRI) or is investor focussed, such as the Taskforce on Climate-Related Financial Disclosures (Petersen et al., 2022).

The implementation of ESG or sustainability reporting can be categorised by two mechanisms – mandatory reporting and voluntary reporting. Mandatory reporting was introduced to ensure that investors, mostly institutional, are provided with the necessary information for their investment decision-making (Krueger, Sautner, Yongiun Tang and Zhong, 2021). Many countries implement mandatory reporting through sustainability or integrated reports (Ioannou & Serafeim, 2017). In their study on the impact of mandatory reporting, Ioannou and Serafeim (2017) concluded that reporting improved transparency and altered the company's behaviour. Their study identified that companies began implementing more ethical policies and focusing on sustainable development. ESG performance, as measured by the rating agencies such as the FTSE Russell, relies on information disclosed by companies (FTSE Russell, 2019). Therefore, it appears that legislated reporting mechanisms allow companies to disclose more information about their ESG practices, affecting their ESG scores. Ioannou and Serafeim's (2017) study shows that mandatory reporting of sustainability practices encourages companies to implement better sustainability practices. As a result, mandatory reporting assists them with their ESG ratings and provides a competitive advantage and ultimately results in increased value creation (Ioannou & Serafeim, 2017).

Krueger et al. (2021) investigated the effect of the types of mandatory ESG reporting imposed by various countries, including South Africa. The study also considered the authority enforcing the reporting, specifically looking at a government versus a stock exchange authority. Their study identified that there is a significant and positive relationship between mandatory ESG reporting and the quality of the ESG reporting. Their study further concluded that mandatory reporting led to fewer adverse ESG events (Krueger et al., 2021). South African companies are mandated to report on sustainability practices through integrated reporting (Krueger et al., 2021). The JSE is the authoritative body requiring integrated reporting (JSE Limited, 2021a; Krueger et

al., 2021). The IIRC developed the International Integrated Reporting Framework (<IR> Framework) in 2013. The integrated report's purpose is to combine an organisation's financial and non-financial aspects, creating a holistic approach to value creation and sustainability over the short, medium, and long term (IIRC, 2021). Although the report is not aimed primarily at sustainability issues, it considers these by recognising and disclosing the six capitals, which include social and relationship, human, and natural (IIRC, 2021).

Herbohn, Walker and Loo (2014) investigated the relationship between sustainability disclosure and the performance of Australian-listed companies from the Energy and Materials industry to identify if there is a correlation between levels of disclosure and sustainability performance. Using stakeholder theory, Herbohn et al. (2014) sought to determine if the sampled companies, which are highly regulated and under public scrutiny, are likely to engage more proactively with stakeholders and, as such, are likely to disclose more information. A significant positive association between performance and disclosure concerning sustainability was identified. Their study further associated this finding with the prior research performed on stakeholder theory, whereby companies use sustainability reporting to manage relationships with their various stakeholders (Herbohn et al., 2014). From their paper, it can be concluded that there is a positive relationship between sustainability disclosure and performance.

The above literature review shows that the legislative reporting environment in which companies operate influences the ESG reporting and practices of these companies (Ioannou & Serafeim, 2017; Krueger et al., 2021). Furthermore, the industry type also influences the level of disclosure, as Herbohn et al. (2014) exhibited.

2.1.2 The investors' perspective

Sustainable investment has grown significantly in past decades. Roundy et al. (2017) identified four types of investors related to sustainable investing: impact investors, angel investors, venture capitalists and traditional philanthropists. In their study, where the behavioural profile of impact investors was analysed and compared to other investor profiles, Roundy et al. (2017) found that impact investors seek both financial and social returns, contrary to the profile of venture capitalists, who seek financial return only. Their study further identified that traditional philanthropy is unique as no financial return is required. Angel investors are like impact investors; however, their

focus is primarily on social returns, with some consideration given to financial returns. The four investor profiles described above differ due to two key drivers – financial and social returns. The emphasis on each driver varies amongst the four investor types, ranging from purely social to purely financial (Roundy et al., 2017).

Jansson and Biel (2011) identified that investors (institutional, investment and private) had varying views on socially responsible, or ESG, investing. Their study determined that socially responsible investing results in lower returns in the short term; however, only institutional investors and investment institutions viewed these investments as generating higher returns than traditional investments in the long term. Their study further identified that using socially responsible investments could reduce financial risk; however, this is significant for investment institutions only (Jansson & Biel, 2011).

Jansson and Biel (2011) concluded that investment institutions are primarily driven by financial returns and employ investment practices to maximise financial returns for the beneficiaries. This was attributed to the likelihood of investment institutions being remunerated according to the performance of funds and may be incentivised based on financial return maximisation. On the other hand, institutional investors use socially responsible investments to reduce their financial risk. Their study attributed this to the likelihood that such investors have greater accountability towards their beneficiaries, given the nature of their investor type (Jansson & Biel, 2011). From their study, it can be observed that investors do not share the same investor profile. Hence companies need to be aware of the type of investor they seek to attract and could potentially use this information to drive their strategy.

Przychodzen et al. (2016) identified that mutual fund managers from the US, Spain, Great Britain, Canada and Poland viewed ESG investments as a short-term risk-reducing investment strategy. Similarly to Jansson and Biel (2011), their study concluded that the managers rely on ESG criteria as a risk reduction method rather than using the criteria to create value for the fund and related beneficiaries (Przychodzen et al., 2016). From their study, it can be observed that incorporating ESG criteria into the investment strategy serves as a risk mitigation tool, even if it may result in lower returns in the short term.

Although not a significant correlation, Alda (2019) identified that socially responsible pension funds as long-term shareholders translated to improved ESG practices, particularly for the environmental aspect. Their study assessed United Kingdom pension funds' investment levels in companies and the relevant ESG indicators of said companies from 2002 to 2018. They observed that a pension fund shareholding improved environmental performance and increased disclosure of "environmental controversies" (Alda, 2019, p. 1065). The author concluded that the presence of pension funds as investors aids in improving sustainable practices, which in turn creates greater transparency (Alda, 2019). Supporting the findings of Jansson and Biel (2011) and Przychodzen et al. (2016), Alda's (2019) study shows that institutional investors are socially conscious and consider ESG factors and financial returns in their investment criteria.

A 2019 McKinsey & Co. survey identified that investors value three primary objectives - reliability, consistency, and financial materiality (Bernow, Godsall, Klempner & Merten, 2019). Regarding financial materiality, investors are concerned with sustainability disclosures that affect the financial value of the investment (Bernow et al., 2019). The survey states that sustainability disclosures that are "material to financial performance" are required (Bernow et al., 2019, p. 5). This finding appears to align with Jansson and Biel (2011) and Przychodzen et al. (2016), whereby they identified that fund managers invest in sustainability investments as a tool to mitigate financial risk. The investors similarly considered sustainability in their investment-making decisions and the benefit of including ESG criteria.

From the literature reviewed on sustainable investment drivers, it was observed that institutional investors incorporate ESG considerations into their decision making as a risk mitigating strategy (Jansson & Biel, 2011; Przychodzen et al., 2016). However, the literature indicates that some investors are moving towards investments that encompass holistic factors and not just financial return, as suggested in the behavioural profiles identified by Roundy et al. (2017). In applying Roundy et al. (2017) investor profile definitions, the investors analysed by Jansson and Biel (2011) and Przychodzen (2016) appear to have the profile of venture capitalists. Alda (2019), however, reflected a different type of investor profile – impact investors. Regardless of the type of investor profile discussed above, the overarching conclusion is that there

has been a general shift in investors' behaviour whereby they incorporate ESG factors into their investment criteria.

2.1.3 The marketplace's perspective

Investors' growing interest in the ESG practices of companies may have influenced sustainability-themed funds, which UNCTAD (2021) has identified as having grown significantly in recent years. In 2020, sustainability-themed funds were made up of 3,435 mutual funds (assets under management of USD (United States Dollar) 1.56 trillion) and 552 exchange-traded funds (ETFs) (assets under management of USD 174 billion) (UNCTAD, 2021). This represented an increase of 30 per cent from 2019 in the total number of funds (UNCTAD, 2021). Furthermore, the sustainability-themed funds discussed above amounted to 3.3% of the assets of all open-ended funds globally as of June 2020 (UNCTAD, 2021).

The development of sustainability-themed ETFs, which incorporate the theme of ESG, has been driven by investors' increasing demand for such funds (UNCTAD, 2021). Although ESG-driven funds represent a small portion of total investment, the significant increase from 2019 to 2020 highlights the shift in investor sentiment, as noted by Przychodzen et al. (2016), Alda (2019) and Jansson et al. (2011). UNCTAD's (2021) World Investment Report confirmed this, stating that the increase in sustainability-themed funds is linked to investors incorporating sustainability criteria into their decision-making.

2.1.4 Development of sustainable investment in South Africa

Sustainable investing in South Africa is not a recent phenomenon. The JSE developed the Socially Responsible Investment (SRI) Index in 2004 (JSE Limited, 2021b). In 2015, the JSE ended this index and created two new indices – the FTSE/JSE Responsible Investment Index and the FTSE/JSE Responsible Investment Top 30 Index (JSE Limited, 2021b). The shift from the SRI Index to the Responsible Investment Series resulted from the JSE identifying the need to evolve the index in line with global sustainability practices, as well as encourage responsible citizenship by companies and the development of their sustainability practices (JSE Limited, 2021b).

Sustainable investing has also been encouraged in South Africa through the King Code. The King Code, which is currently in its fourth version, must be applied by JSE-

listed companies (JSE Limited, 2021a). The focus of the King Code, particularly King IV, is the shift from the traditional shareholder model to what the Code refers to as stakeholder inclusivity (Institute of Directors in Southern Africa, 2016). This model encourages the management of companies to focus on how they affect other stakeholders related to the company, such as customers, employees, and the natural environment.

2.2 DETERMINANTS OF ESG PERFORMANCE

In the previous sections, the development of sustainability investing was discussed, including the practices that the corporate and financial environment have undertaken in response to sustainability. This section seeks to identify the determinants of the ESG performance of companies, to develop a profile of companies that exhibit higher levels of ESG performance.

Garcia, Mendes-Da-Silva and Orsato (2017) researched the relationship between the financial profile and type of industry of a company and its ESG performance, specifically in the BRICS (Brazil, Russia, India, China and South Africa) countries. Their study identified that companies who operated in more sinful (or sensitive) industries were likely to have increased ESG performance compared to non-sensitive companies. Their study concluded that this served as evidence for prior literature on corporate environmental legitimacy, whereby companies who operate in sensitive industries disclose more information about their environmental performance to preserve their reputation. Garcia et al. (2017) used legitimacy theory to explain how the more sensitive industries will likely have better environmental performance. Firms with increased reputational risk due to the industry in which they operate need to manage this risk and provide increased disclosure about their performance compared to other companies. Their study further identified that free cash flow was positively correlated to overall ESG performance, concluding that if companies have increased cash reserves compared to their peers, they are more likely to enter into investments, including ESG-related investments. However, the hypothesis that there is no association between the company profile and overall ESG performance was accepted. Contributing to the existing literature, their study identified that the company's size positively correlates to overall ESG performance, which the authors attributed to larger companies having greater resources available to invest in ESG practices. The

hypotheses[1] relating to the relationships between the overall ESG performance of a company and its company profile and whether it is operating in a sensitive industry were accepted (no significant association). However, a significant association[2] between environmental performance and the profitability of companies was identified. Similarly, a significant association between environmental performance and operating within a sensitive industry was identified. No significant correlation was identified regarding the social and governance performance variables (Garcia et al., 2017).

Cheng, Ioannou and Serafeim (2014) identified that better corporate social responsibility (CSR) practices have lower restrictions concerning capital. Their study attributed this to two factors – firstly, stakeholder engagement and secondly, transparency and accountability. Stakeholder engagement reduces "opportunistic behaviour", thereby minimising agency costs (Cheng et al., 2014, p. 16). Additionally, their study noted that improved stakeholder engagement enhances the ability of the company to generate revenue. The second factor is transparency and accountability, which implies that companies with better CSR practices are more likely to have increased levels of disclosure. Therefore, more information is presented to the stakeholders. Their study explained that companies with better CSR performance provide increased disclosure around this performance. As such, information

[1] The following hypotheses were accepted (no significant association) by Garcia et al. (2017, p. 145)
H1: There is no significant association between the profitability of the investments of a company and its overall ESG performance.
H1b: There is no significant association between the profitability of the investments of a company and its social performance.
H1c: There is no significant association between the profitability of the investments of a company and its corporate governance performance.
H2: There is no significant association between a company in a sensitive industry and its overall ESG performance.
H2b: There is no significant association between a company in a sensitive industry and its social performance.
H2c: There is no significant association between a company in a sensitive industry and its corporate governance performance.

[2] The following hypotheses were rejected (significant association) by Garcia et al. (2017, p. 145)
H1a: There is no significant association between the profitability of the investments of a company and its environmental performance.
H2a: There is no significant association between a company in a sensitive industry and its environmental performance.

asymmetry, which may have existed if the company did not have good CSR practices, is reduced, thereby reducing the company's risk (Cheng et al., 2014).

This section revealed that multiple attributes of a company could affect ESG performance, from how financially constrained the company is, to the industry in which it operates, its level of free cash flow and the size of the company. Therefore, understanding the company profile can provide insight into how management can develop the company's strategy and identify areas to improve to positively influence the achievement of the ESG objectives for the company.

2.3 DETERMINANTS OF FOREIGN INVESTMENT IN SOUTH AFRICA

The previous sections have analysed the evolution of sustainable investing and the shift in investors' behaviour to incorporate ESG criteria into their investment-making decisions, concluding that the global investing community considers ESG criteria. This section will now analyse the current and historical state of foreign investment in South Africa to determine if ESG impacts foreign investment. In analysing the effects of foreign investment, this section will consider both foreign direct investment (FDI) and foreign portfolio investment (FPI).

2.3.1 Foreign Direct Investment

2.3.1.1 Global considerations of FDI

Direct investment is defined by the International Monetary Fund (2009, p. 100) as "a category of cross-border investment associated with a resident in one economy having control or a significant degree of influence on the management of an enterprise that is resident in another economy."

The Organisation for Economic Co-operation and Development (OECD) (2002) identified FDI as a key factor contributing to development. FDI is a growth enabler, as concluded by the OECD (2002), in that through FDI, higher growth rates can be achieved. Globally, FDI declined significantly by 35% in 2020 (UNCTAD, 2021). This decline was mainly attributed to the COVID-19 pandemic. A slow increase in FDI inflows is expected for both 2021 and 2022, and it is expected that FDI inflows will remain lower than pre-pandemic levels. This is due to the uncertainty of the pandemic and its effect on the supply chain. Additionally, FDI inflows to Africa may not return to prior years' levels yet (UNCTAD, 2021).

Given the importance of FDI towards a country's economy (OECD, 2002), several policies and regulatory bodies have been developed to regulate FDI flows. For example, the E15Initiative was established by the International Centre for Trade and Sustainable Development and the World Economic Forum as a global response to ensure that the future of global trade supports sustainable development through a set of policies (Sauvant, 2016). The body shares the view of the OECD, stating that international investment aids in addressing job opportunities and promoting growth and development (Sauvant, 2016).

Aust, Morais and Pinto (2020) identified that FDI could positively affect the achievement of the SDGs by developing countries, particularly African developing countries. However, in positively achieving specific SDGs, their study found that FDI may result in worsening climate change activities. Their study attributed this finding to the issue of certain economies possibly using FDI to transfer their negative activities and processes from their developed economy to the developing economy (Aust et al., 2020). In his research on implementation measures to assist companies in achieving the SDGs, Suehrer (2019) similarly recognised that FDI can influence the ability of a country to achieve its SDGs. There is an increased focus on attaining SDGs following the 2030 Agenda for Sustainable Development (Suehrer, 2019). Suehrer (2019) noted in the prior literature that investors are moving away from a profit-orientated investing model and towards models that consider impact investing and have consideration for the SDGs. This aligns with the literature discussed in this study (Alda, 2019; Jansson & Biel, 2011; Przychodzen et al., 2016); investors are shifting their investment strategies to include ESG criteria in their investment-making decisions. Suehrer (2019) concludes that the perception and use of FDI should be reconsidered. The author continues to state that through policies and frameworks that support the achievement of the SDGs, opportunities could become available for investors looking to move towards a holistic approach to investing and promote impact investing as opposed to traditional profit-centred investment strategies (Suehrer, 2019).

The E15Initiative published a paper that focussed on identifying the core characteristics of sustainable FDI. The rationale for this research was acknowledging that FDI is essential for countries achieving their SDGs. However, the type of FDI provided has not been sustainable (Sauvant & Mann, 2017). This echoes the views

Aust et al. (2020) held, where achieving one goal may lead to the decline of another. FDI does not only infer the provision of financial capital but also includes imparting skills and knowledge from one country to another (Echandi, 2017). Both Sauvant & Mann (2017) and Echandi (2017) share a similar sentiment that policies surrounding the types and nature of FDI are imperative to maximise the benefits associated with FDI and the desired outcomes. Although there is a need for stricter policies directing international investment, another argument exists whereby the actions and behaviours of investors are brought into question (Sauvant, 2016). Suggested measures to refine the behaviour of investors include amendments to laws and regulations, contracts, and the act of "naming and shaming" of investors not acting in a manner expected of them, imposed through international investment agreements (Sauvant, 2016, p. 24).

Sustainable investments are becoming more integrated into traditional investing; however, several concerns continue to exist over the continued implementation of sustainability practices. As highlighted in the World Investment Report 2021, three issues are identified as challenges to sustainability: "niche market risk", "geographical imbalance", and "ESG/SDG-washing concerns" (UNCTAD, 2021, p. 233). Therefore, three transitions are recommended to address the above issues – from a niche market to a market norm, from developed countries to a global movement, and implementing regulations to improve sustainability ratings, their reliability and reporting (UNCTAD, 2021).

The above demonstrates how there has been a shift in the global investment market to incorporate ESG into these financial decisions. Having this understanding provides insight into the mindset of the international investor. It leads to the expectation that foreign investors will likely consider ESG criteria in their investment decisions, which may be a factor when investing in South African companies.

2.3.1.2 South African considerations of FDI

FDI has been a concern for South Africa for several years. Several credit-rating agencies, including Moody's, Fitch and Standard and Poors (S&P), have been downgrading South Africa's credit ratings for the last decade (World Government Bonds, 2021). The World Investment Report (UNCTAD, 2021) highlighted some impacts, particularly for developing countries, of the downgrading of sovereign credit ratings such as increased borrowing costs. South Africa observed a fifteen per cent

reduction in FDI inflows for 2019, with FDI inflows totalling $4.6 billion, according to the World Investment Report 2020 (UNCTAD, 2020). Linking credit ratings and FDI together, Takawira and Motseta (2021) observed a positive relationship between credit ratings and financial flow. Their study analysed the relationship between FDI inflows to South Africa and the credit ratings as determined by the credit rating agency S&P over a period from 1994 to 2017. It was suggested that macroeconomic variables can affect the country's financial flows and influence the credit rating awarded (Takawira & Motseta, 2021). FDI inflows have been vital to South Africa's growth (Arvanitis, 2005). Therefore, the reduction in FDI inflows and the downgrading of its credit ratings may have an adverse effect on the economic growth in South Africa (Takawira & Motseta, 2021).

In their research into the FDI inflow determinants for South Africa during the early 2000s, Arvanitis (2005) performed a panel data analysis across 17 countries during the period 1984 – 2001. Arvanitis (2005) investigated the following factors – market demand and size, infrastructure, cost-related locational factors, investment environment, and country risks. Their study identified several factors as having a positive and significant correlation to FDI inflows (represented as a percentage of gross domestic product (GDP)). These included exchange rate volatility, which served as a proxy for cost-related locational factors; trade openness, which served as a proxy for the investment environment; and telephone lines per 1000 people, which served as a proxy for infrastructure quality. Arvanitis (2005) further identified a negative and significant correlation between FDI inflows as a percentage of GDP and tax revenue as a percentage of GDP. Arvanitis (2005) attributed tax revenue as a percentage of GDP to be a proxy for fiscal burden. The author did not conclude that there is a significant relationship between GDP growth and FDI inflows but observed that countries with higher growth rates attracted increased levels of FDI inflows (Arvanitis, 2005).

Arvanitis' (2005) research, performed on the FDI inflow determinants[3] of countries comparable to South Africa at the time of the undertaking, identified four key factors

[3] The following determinants of FDI were used by Arvanitis (2005, p. 71):
1. Market demand and market size – GDP per capita; population; GDP growth

influencing FDI inflows - trade openness, availability of skills, potential market size, and the extent of infrastructure development. Arvanitis (2005) concluded that these four factors should be addressed for South Africa to encourage growth. Addressing these factors should lead to an inflow of FDI to the country and will likely increase economic development and growth. The factors affecting FDI inflows into Africa have been explored extensively. Masipa (2018) studied the relationship between FDI inflows and economic growth from a South African perspective from 1980 to 2014. It was concluded that the relationship observed follows the traditional belief that FDI inflows and increasing GDP levels translate to economic growth. The author identified three determinants of FDI inflows for South Africa - labour cost, crime and corruption (Masipa, 2018).

FDI inflows were reduced globally by 35% in 2020, and South Africa experienced a reduction in FDI inflows of 39% (UNCTAD, 2021). This could be attributed to the increased costs incurred due to the pandemic, the decline of GDP by eight per cent and the considerable reduction in international merger and acquisition deals by 52% (UNCTAD, 2021). Further noted was the decline in FDI inflows to Africa pertaining specifically to achieving the SDGs for the year 2020, except that of renewable energy (UNCTAD, 2021). In 2021, however, FDI inflows to South Africa increased from approximately USD 3.1 billion to USD 40.9 billion (UNCTAD, 2022), representing an increase of 1219%. This increase could be primarily attributed to an interfirm transaction between Prosus and Naspers (UNCTAD, 2022). However, this increase may not represent sustainable and long-term growth of FDI inflows to South Africa.

In linking FDI inflows to sustainability, Williams, Abu Alrub and Aga (2022) analysed the relationship between ecological footprint and FDI inflows in South Africa. Their study defined ecological footprint as a measure of environmental degradation as it assesses how natural resources as utilised in production for human consumption. Their study identified a positive linkage between these two variables, concluding that

2. Infrastructure and other externalities – infrastructure; degree of industrialisation; stock of foreign investment
3. Cost-related locational factors – dollar wages; unit labour costs; quality of labour; cost of capital; exchange rate volatility; level of taxation
4. Investment environment – openness
5. Country risks – political risk index; financial risk index

the regulatory landscape in South Africa requires a change to ensure that FDI inflows are being directed towards sustainable investments in South Africa, as opposed to environmentally damaging industries.

The above literature review identified many vital variables that influence FDI inflows to South Africa. However, these variables are country-specific at the macro level and will impact all companies listed on the JSE. As this study is assessing the relationship between company-specific factors, the FDI variables are not appropriate for inclusion for further testing in the analysis.

2.3.2 Foreign Portfolio Investment

FPI is defined by the International Monetary Fund (2009, p. 110) as "the cross-border transactions and positions involving debt or equity securities, other than those included in direct investment or reserve assets".

Whilst FDI has been identified as a stable source of capital compared to FPI, there are benefits of FPI in contributing to sustainable development (UNCTAD, 2021). As discussed in *2.1.3 The marketplace's perspective*, there has been substantial growth in sustainability-themed investments between 2019 and 2020, with assets such as sustainable funds, green bonds and social bonds being invested in (UNCTAD, 2021). The World Investment Report 2021 identified that this substantial increase can be linked with investor behaviour, who are increasingly incorporating sustainability criteria into their decision-making (UNCTAD, 2021).

The sustainability-themed funds are also aligned to achieving the SDGs. Per the World Investment Report 2021, 27 per cent of the total assets invested in sustainable equity funds are used to support eight key SDG sectors, including renewable energy, water and sanitation, and ecosystem diversity (UNCTAD, 2021).

The investment community, particularly institutional investors have an important role in driving change in organisations. Achievement has been identified through two channels – asset allocation and active ownership (UNCTAD, 2021). Similar to existing literature (Jansson & Biel, 2011; Przychodzen et al., 2016), institutional investors have incorporated ESG factors into their investment decisions, thereby utilising asset allocation as a mechanism of supporting sustainable development (UNCTAD, 2021). When considering the mechanism of active ownership, it is estimated that the top 100

pension funds and sovereign wealth funds globally own approximately five per cent of all listed equities (UNCTAD, 2021). As suggested in the World Investment Report 2021, this level of shareholding enables the investors to influence discussions and exercise voting rights in support of sustainable practices (UNCTAD, 2021).

In the same study detailed in *2.3.1.2 South African considerations of FDI*, Takawira and Motseta (2021) also considered the relationship between FPI and sovereign credit ratings, with results being in line with that of the FDI analysis. Their study concluded that overall there is a positive relationship between financial flows and credit ratings, thereby concluding that adverse macroeconomic variables can have a substantial impact on increasing foreign flows to South Africa (Takawira & Motseta, 2021). Therefore, based on the above, similarities can be drawn between both FDI and FPI as it pertains to South Africa.

Both FDI and FPI consider foreign equity ownership of companies. For the purposes of this study, foreign investment incorporates definitions from both FDI and FPI and is defined as any foreign equity interest in a company.

2.4 THEORIES IDENTIFIED FROM PRIOR LITERATURE

This study seeks to determine if there is a relationship between ESG performance and foreign investment in JSE-listed companies. Prior literature provides evidence of investors incorporating ESG criteria into their investments for various reasons (Alda, 2019; Jansson & Biel, 2011; Przychodzen et al., 2016). The literature explained this primarily through stakeholder, institutional, and agency theory.

This study attempts to determine if there is a relationship between the foreign shareholding of JSE-listed companies and their ESG scores. Stakeholder theory is appropriate for this study. From the literature reviewed, there appears to be a global movement from an investor perspective towards the inclusion of ESG criteria in investment-making decisions (Alda, 2019; Jansson & Biel, 2011; Przychodzen et al., 2016). The stakeholders identified for companies include their foreign shareholders and the stakeholders relating to ESG (for example, natural environment, communities, and employees). The rationale for using stakeholder theory is that companies should consider the needs of their key ESG stakeholders and the global investor market, represented mainly by foreign shareholders. Although the prior literature identified

three primary theories, only stakeholder theory will be discussed in depth and used in this study.

Freeman (2010) identified the need for organisations and their management to develop strategic plans that consider both the internal and external environment. However, in determining this strategic plan, Freeman (2010) identified that management must distinguish between what is insignificant against what is material to the business and requires an appropriate response. Freeman (2010) describes the internal environment as groups that companies engage with regularly, such as customers, employees, and owners and the external environment as the pressures and events that management cannot control. According to Freeman (2010), the external environment falls into the unknown category. Their study argues that by management considering the external environment groups and the potential effects, their existence would not be as chaotic as they are when not included in the strategic plan. Groups that Freeman (2010) includes within the external environment are the government, in that their legislations and policies can have significant effects on the operations of businesses, and environmentalists, who voice concerns over the treatment of the environmental resources, including land, water and air. The author further proposes that one way of managing both the internal and external environment groups is to view them as stakeholders, with an understanding required of each stakeholder, what issues are associated with them, and the influence on the business (Freeman, 2010). As Freeman (2010) outlined, stakeholder theory explains the strategic management model. The term stakeholder represents each group with a stake in the organisation in some way or form (Freeman, 2010). Such groups must be able to affect either the direction of the organisation's strategy or the organisation's ability to implement the said strategy (Freeman, 2010).

In applying the concept of stakeholder theory to a South African-specific environment, the relevant JSE-listing requirements were reviewed. All companies listed on the Johannesburg Stock Exchange must apply the principles of the current King Code, with King IV being the most recent edition (JSE Limited, 2021a). The King Report was introduced in South Africa as a guideline for all companies to conduct their operations in line with good corporate governance. The principles of the Report are "the benchmark for corporate governance in South Africa" (Institute of Directors in Southern

Africa, 2016, p. 20). An underlying theme of King IV is the concept of stakeholder inclusivity. The King IV Report defines this as an organisation considering the "legitimate and reasonable needs, interests and expectations of all material stakeholders in the execution of its duties in the best interests of the organisation over time" (Institute of Directors in Southern Africa, 2016, p. 17). This definition intends to allow organisations to consider the requirements of all stakeholders who create value for the organisation and not only focus on the interests of the financial capital providers (Institute of Directors in Southern Africa, 2016).

The King IV Report's stakeholder-inclusive approach (Institute of Directors in Southern Africa, 2016) echoes the stakeholder management model's principles, as Freeman (2010) proposed. Alda's (2019) research sought to understand the role that socially responsible pension funds have in influencing the companies in which they invest regarding their sustainability practices. The research utilised stakeholder theory as one of the theories to derive the hypotheses[4] for the study, relying on the premise that organisations focus on the interests of their stakeholders. This is further explained in that there may be an alignment in the social considerations of the company and that of the institutional shareholders (socially responsible pension funds) (Alda, 2019). Although their hypotheses were rejected, the study concluded that the type of shareholder that the socially responsible pension funds represent, being long-term institutional investors, can influence the organisation's strategy in developing ESG practices (Alda, 2019).

This study aims to identify if there is a positive and significant relationship between the foreign shareholding percentage of JSE-listed companies and their ESG scores. This research will therefore provide evidence towards the theory of firms employing the stakeholder inclusivity model proposed by Freeman (2010) and the King Report

[4] The following hypotheses were rejected by Alda (2019, p. 1061) as it pertains to the role of the pension funds in influencing sustainability:
H1: Social responsible pension funds have a positive influence on corporate sustainability by promoting the ESG practices of investee firms.
H2: The ESG practices enhanced by social responsible pension funds increase firm prices and profitability.

(Institute of Directors in Southern Africa, 2016), thereby contributing to the existing literature.

2.5 RESEARCH QUESTION AND HYPOTHESES

The stakeholder inclusive approach/stakeholder management theory, as defined by the Institute of Directors in Southern Africa (2016) and Freeman (2010), has been used in defining the research hypothesis. This theory is appropriate for this research, as it is a requirement for all companies listed on the JSE to apply the principles of King IV (JSE Limited, 2021a) and are therefore required to apply the King IV approach towards stakeholder inclusivity.

Stakeholder theory requires companies to consider the needs and interests of their stakeholders and act per the will of the stakeholder (Freeman, 2010). The literature review on the drivers of sustainable investment highlights a shift from traditional investing, whereby only short-term financial profits were considered, towards a more holistic approach, whereby investors consider both financial and non-financial criteria in their investing decisions. However, the motives behind the behaviour of the investors are not necessarily intended for doing good but rather are used to minimise financial risk. Regardless, investors' behaviour is shifting towards including ESG factors in investment decisions; therefore, stakeholder theory is appropriate for developing a hypothesis.

The literature review highlighted the importance of foreign investment to South Africa, as well as the investor sentiment regarding sustainability. The literature review shows a gap regarding the relationship between foreign shareholding and ESG performance. As such, the resulting research question is defined as follows – is there a relationship between ESG scores, as determined by the FTSE Russell[5], and the foreign

[5] Source: London Stock Exchange Group plc and its group undertakings (collectively, the "LSE Group"). © LSE Group 2022. FTSE Russell is a trading name of certain of the LSE Group companies. "FTSE®" "Russell®", "FTSE Russell®", "ICB®", is/are a trade mark(s) of the relevant LSE Group companies and is/are used by any other LSE Group company under license. All rights in the FTSE Russell indexes or data vest in the relevant LSE Group company which owns the index or the data. Neither LSE Group nor its licensors accept any liability for any errors or omissions in the indexes or data and no party may rely on any indexes or data contained in this communication. No further distribution of data from the LSE Group is permitted without the relevant LSE Group company's express written consent. The LSE Group does not promote, sponsor or endorse the content of this communication.

shareholding percentage of companies listed on the JSE in a pre-COVID trading environment?

This research will focus on South African companies, particularly those listed on the Johannesburg Stock Exchange. The study will also use each significant element of the FTSE Russell scoring system and the total score. The hypotheses, therefore, are defined as follows:

H1: There is a significant relationship between the overall ESG score and foreign shareholding percentage of JSE-listed companies in a pre-COVID trading environment.

H2a: There is a significant relationship between environmental ESG performance and the foreign shareholding percentage of JSE-listed companies in a pre-COVID trading environment.

H2b: There is a significant relationship between social ESG performance and the foreign shareholding percentage of JSE-listed companies in a pre-COVID trading environment.

H2c: There is a significant relationship between governance ESG performance and the foreign shareholding percentage of JSE-listed companies in a pre-COVID trading environment.

2.6 CONCLUSION

Impact investing has been identified as the future of FDI (Suehrer, 2019). The literature review reveals a shift in the investment approach by investors towards considering both financial and non-financial criteria (Alda, 2019; Jansson & Biel, 2011; Przychodzen et al., 2016; Suehrer, 2019), even if the rationale for incorporating such criteria is for the achievement of financial goals through risk mitigation. FDI in South Africa has been low, with an overall decline in FDI inflows recently reported for 2020 (UNCTAD, 2021). This study seeks to determine if there is a solution to promote both ESG practices in South Africa and become attractive to the foreign investment market, resulting in increased foreign investment. Should this study result in the hypotheses being accepted, it may provide evidence for organisations to shift towards ESG practices that support the SDGs. This may result in attracting the interest of the foreign

investment market, resulting in a two-fold outcome: increased sustainability measures being implemented in South Africa and increased foreign investment, resulting in economic growth.

CHAPTER 3 - METHOD

The review of existing literature identified a gap in understanding investor behaviour concerning ESG practices, particularly regarding foreign investment towards developing countries, such as South Africa. Accordingly, this study seeks to determine if there is a relationship between the foreign shareholding percentage of JSE-listed companies and their ESG scores.

This chapter discusses the data collection procedures for the variables and the limitations identified in determining the final population. The chapter then discusses the analytical work performed on the data, including the descriptive statistics, the regression models, and the k-means cluster analysis.

3.1 DATA COLLECTION

In conducting the literature review, several variables were identified as relevant to this research. These have been detailed further in this section. This section will discuss the determination of the population, relevant data collection procedures and data sources for the variables.

3.1.1 Population determination

All companies listed on the JSE, which the FTSE Russell has scored, have been included in the data set for further analysis. The population was determined by first extracting a listing of equity securities (identified with a ticker “SJ EQUITY”) listed on the JSE as of 31 December 2019 from Bloomberg. Equity securities included ETFs and preferred stock. Due to the impact of the COVID-19 pandemic, it was expected that data relating to the 2020 calendar year would be abnormal compared to the preceding years. As such, the calendar years following 2019 were not considered for this research. Security-specific information was extracted for these securities, including the security name, ticker details and the International Securities Identification Number (ISIN). A total of 462 securities were extracted.

The FTSE Russell only scores securities listed on the Russell 1000 Index, the FTSE All-Share Index and the FTSE All-World Index (FTSE Russell, 2021). Accordingly, any JSE-listed company which the FTSE Russell does not score is excluded from this study’s sample because comparable ESG data does not exist for such companies.

A VLOOKUP search function was used in Excel to match the ISIN of each company listed in the 2019 Bloomberg list to the ISIN of the companies scored by the FTSE Russell from 2015 to 2019 (inclusive). The ISIN was used as an identification tool to create the final population. It is an internationally recognised method to identify securities and is currently the most common method used globally (JSE Limited, 2021c). In addition, the ISIN includes the country of the company's head office, as indicated by the first two letters of the ISIN (ISIN Organisation, 2022). The resulting population equated to 412 data points spread across five years, illustrated further in Table 1 below. The population was further reduced for reasons discussed in the sections below and presented in Table 1.

Table 1: Summary of final data population

	2015	**2016**	**2017**	**2018**	**2019**	**Total**
Row 1: Initial population of FTSE Russell-rated companies	78	79	85	89	81	**412**
Row 2: Companies not yet rated by the FTSE Russell	-2	-2	-0	-2	-1	**-7**
Row 3: Bloomberg data availability	-2	-2	-1	-1	-1	**-7**
Row 4: Less than 95% shareholding reported on Bloomberg	-0	-0	-1	-1	-2	**-4**
Row 5: Unknown shareholding greater than 25%	-15	-16	-30	-28	-33	**-122**

Row 6: Refinitive Eikon Datastream data availability	-3	-1	-1	-1	-1	**-7**
Final companies included in the sample	**56**	**58**	**52**	**56**	**43**	**265**

As the population was determined using companies listed as of 31 December 2019, companies that may have delisted before 2019 were not included in this study, serving as a limitation for this study.

3.1.2 Independent variable: ESG Scores

The ESG scores used in this study have been obtained directly from the FTSE Russell. The FTSE Russell scores approximately 7 200 securities, sourced from three indices: the FTSE All-Share, the FTSE All-World and the Russell 1000, whereby publicly available information regarding a company's sustainability practices is evaluated against pre-determined ESG factors. As a result, Row 1 of Table 1 above fluctuates due to the FTSE Russell assessing companies listed on the above three indices only.

The ESG Ratings determined by FTSE Russell have been created with the SDGs in mind (FTSE Russell, 2021). The FTSE Russell calculates the ratings using three pillars – environmental, social, and governance. The FTSE Russell scores each company across 14 areas. Figures 1 and 2, below, visually summarises the methodology employed by the FTSE Russell.

Figure 1: Pillars and themes of the ESG Ratings (FTSE Russell, 2021)

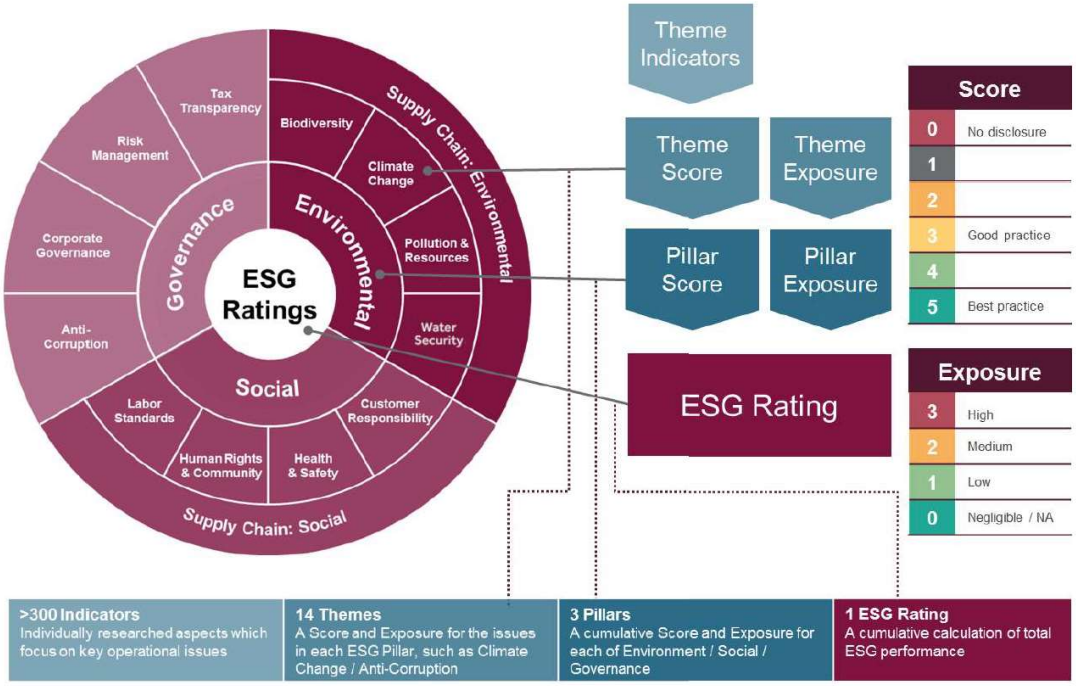

Figure 2: ESG Ratings Model (FTSE Russell, 2019)

As per Figure 2, three categories of scores are determined - the overall ESG score, three pillar scores, and 14 theme scores. For this research, the analysis is limited to

the first two tiers - the overall score and three pillar scores, with the theme scores used to understand the descriptive statistics of the data further. A rating model is used to score companies' ESG performance. Companies are awarded scores between a value of zero and five. This is applied across all score categories (overall, pillar and theme). Where no disclosure is provided, a score of zero is used (FTSE Russell, 2019). Exposure levels are used to calculate the theme and pillar scores. The exposure level weights the score according to the industry and location in which the company is operating (FTSE Russell, 2019). Companies may be awarded a N/A rating at a theme level only, where a theme is deemed irrelevant for a specific company based on its industry classification and location (FTSE Russell, 2019). Companies that were recently added to the indices were removed from the final sample, as these were still being researched and as such no final score had been provided for the relevant year. This is illustrated in Row 2 of Table 1 above.

The longitudinal scope includes ESG data as of 31 December for each calendar year from 2015 to 2019. The ESG data used for each calendar year-end was not necessarily extracted on 31 December. The exact date used depended on when data was available from the FTSE Russell for that period and if 31 December was on a weekend or weekday. Where 31 December occurred on either a Saturday or Sunday, the preceding Friday was used as the best representative of 31 December.

3.1.3 Dependent variable: Foreign shareholding of companies

This study has identified the foreign shareholding percentage of companies as a proxy for foreign investment. This draws on the definitions of both FDI and FPI where they pertain to equity securities.

FDI is defined as "a category of investment that reflects the objective of establishing a lasting interest by a resident enterprise in one economy (direct investor) in an enterprise (direct investment enterprise) that is resident in an economy other than that of the direct investor" (OECD, 2008, p. 234). The OECD further provides that the definition of a lasting interest is one where the foreign investor owns more than ten per cent, as it considers this the level at which investors can influence company decisions (OECD, 2008). Foreign portfolio investment is defined by the International Monetary Fund (2009, p. 110) as "cross-border transactions and positions involving debt or equity securities, other than those included in direct or reserve assets". This definition

is further expanded to consider securities traded in financial markets, but specifically excludes equity interests that is not held as a security (International Monetary Fund, 2009). Linking in with the definition of FDI, as defined by the OECD, portfolio investments exclude the definition of control, thereby implying that the ten per cent requirement detailed above is not applicable (International Monetary Fund, 2009). As such, foreign shareholding percentage serves as a natural proxy to consider both equity elements of FDI and FPI.

The dependent variable was obtained from Bloomberg. The data presented by Bloomberg has several limitations, confirmed per written correspondence with Bloomberg. Firstly, the shareholding data collected by Bloomberg is based on publicly reported shareholding, not total shares outstanding. Secondly, the country of domicile is determined based on what has been publicly disclosed by the shareholders. Where shareholders have not disclosed their country, Bloomberg has assigned them to the unknown category. The result of this has been discussed further below.

The researcher manually captured the data from the Bloomberg terminal into an Excel workbook using the company ticker name. For this study, the last day of the calendar year, 31 December 20XX, was used to collect the data. Data was not always available on this date, and as such, the preceding date for which Bloomberg had data available, as indicated by Bloomberg, was selected. This was reasonable, as the date used represents the most recent data from Bloomberg relevant to the period. Table 2, below, indicates the dates used when collecting the data from Bloomberg.

Table 2: Dates used to collect shareholding data from Bloomberg[6]

Methodology Date	Date used as per the Bloomberg terminal
31 December 2015	27 December 2015
31 December 2016	25 December 2016
31 December 2017	31 December 2017

[6] Data from the Bloomberg terminal was manually collected by the author of this study.

31 December 2018	30 December 2018
31 December 2019	29 December 2019

Bloomberg provides only publicly available data, resulting in limitations in the data. For example, some companies had a nil shareholding percentage, indicating a lack of data availability. Therefore, these companies were removed from the population, as reflected in Row 3 of Table 1. Additionally, the total shareholding percentage did not always equate to 100%. Therefore, where the total shareholding did not equate to 95% or higher, these companies were excluded from the population. This was reasonable, as the data extracted from Bloomberg was based on what was made publicly available at the time of collection. The effect of this is illustrated in Row 4 in Table 1 above.

The data from Bloomberg also included a shareholding line item labelled *unknown*. Per confirmation with Bloomberg, *unknown* indicates that the shareholder has not disclosed their country of domicile. According to the South African Companies Act 2008, a special resolution of shareholders is one where at least 75% of the available voting rights of a company are exercised towards that specific resolution (South Africa, 2008). Therefore, all companies with an unknown shareholding exceeding 25% were removed from the population, as at least 75% of the voting rights cannot be identified in terms of geographic location (South African or foreign). As such, the ability to influence a company's decision-making from either a local or foreign perspective is unknown, and the unknown category will adversely affect the reliability of the results produced and the interpretation thereof. This is illustrated through Row 5 of Table 1 above.

Three key categories were extracted from Bloomberg regarding the shareholding percentage of companies – local shareholding, which represents the total South African ownership; unknown, which represents the total shareholding that has an unknown country of domicile; and foreign shareholding, which represents the total remaining shareholding percentage (total less local and unknown). An example of this determination is included in Table 3 below for illustrative purposes. Per Table 3, the foreign percentage of this sample company would be 10% - the Unknown and South Africa categories are excluded. This study used only publicly available data to

determine foreign shareholding extracted from Bloomberg. As such, this study does not consider the effect of foreign shareholding included under the Unknown category, serving as a limitation in the study.

Table 3: Example of the breakdown of a company's shareholding as presented by Bloomberg

Category	Shareholding	Commentary
South Africa	74%	This is extracted directly from Bloomberg, under the country identified as "South Africa."
Unknown	16%	This is extracted directly from Bloomberg, under the country identified as "Unknown."
Total of foreign countries	10%	This is the total of all other countries, excluding South Africa and Unknown.
Total shareholding	100%	This is the total of all shareholding categories, summed by the researcher to ensure that a full population is included in this study.

3.1.4 Control variables: ESG performance

The literature chapter identified several variables as having a relationship with ESG performance. Garcia et al. (2017) identified variables such as the industry type, free cash flow, firm size and profitability affecting overall ESG performance and also observed a significant association between environmental performance and profitability and industry, respectively. Cheng et al. (2014) identified a linkage between a company's corporate socially responsible practices and capital restrictions, resulting in CSR practices improving as capital restrictions were lowered.

The KZ index, as described by Cheng et al. (2014), was developed by Kaplan and Zingales and has been used throughout corporate finance literature to define restrictions on capital. Cheng et al. (2014) considered capital constraints to be those

market factors that restrict a company from obtaining its intended financing such as factors restricting the issuance of equity. Kaplan and Zingales (1997) assessed a population of low-paying dividend manufacturing companies in developing their index of determining capital constraint. Although Kaplan and Zingales' (1997) research was restricted to only manufacturing companies, the use of this index as an indicator of capital restraint was deemed appropriate, given its use in the study performed by Cheng et al. (2014). In their research, Cheng et al. (2014) assessed a diverse population, which included companies from various countries, such as Brazil, China, the US and South Africa. In addition, these companies represented multiple industries, including mining and construction, trade, personal, business and entertainment services, professional services, and public administration. Five key ratios are used to calculate the KZ index, which has been explained further in Appendix 1.

Table 4 describes the variables above and their relevance for this study in their role as control variables. The control variable data was obtained using a Refinitive Eikon Datastream terminal. In extracting this data, limitations were observed in data availability on Datastream, reflected in Row 6 of Table 1 above. The definitions of the control variables are included in Appendix 2.

Table 4: Control variables relating to ESG performance

Variable Name	Description & Proxy used	Reason for inclusion	Data Source
Industry	Garcia et al. (2017) assigned values to industries according to a binomial scale – a company was given a value of one if it was identified as a sensitive industry and zero if not. The following industries were awarded a value of one by Garcia et al. (2017 p. 140) – "major socio environmental impact: energy - includes oil and gas, chemicals, paper and pulp, mining and steel-making". For this research, the following industries are included as sensitive industries: *Precious metals and mining* *Industrial metals and mining* *Chemicals*	Companies in sensitive industries are more likely to have consistent disclosures compared to companies in less sensitive industries (Garcia et al., 2017)	Eikon Datastream

Variable Name	Description & Proxy used	Reason for inclusion	Data Source
	Oil, Gas and Coal *Industrial materials* The industry descriptions serve as a limitation, as the industry description was extracted once for the entire data set and not at the various intervals depicted at the calendar year-end (2015-2019).		
Free cash flow	Free cash flow is proxied by Net Cash Flow – Operating Activities, as defined by Datastream Worldscope.	A positive correlation was identified in the literature between the free cash of companies and their overall ESG performance. Companies with increased cash reserves are more likely to enter into investments, including ESG-related investments (Garcia et al., 2017). Garcia et al. (2017, p. 140) defined free cash flow as the "value in US$ based on the series	Refinitiv Eikon Datastream

Variable Name	Description & Proxy used	Reason for inclusion	Data Source
		of cash receipts that comprise the cash flow divided by the average weighted cost of capital."	
Company size	Garcia et al. (2017) measured company size through two proxies: the natural logarithm of market capitalisation and the natural logarithm of net revenue (US dollars). For this study, market capitalisation and net revenue will proxy for company size. These will be extracted in South African Rands (ZAR), as this study is specific to South Africa.	A positive correlation was identified between the size of a company and overall ESG performance (Garcia et al., 2017).	Eikon Datastream
Profitability	Garcia et al. (2017) assessed profitability through numerous measures, including asset profitability, systematic risk index, financial leverage index, firm size and free cash flow.	A significant association was identified between a company's profitability and the environmental component of its ESG performance (Garcia et al., 2017).	Eikon Datastream – Worldscope

Variable Name	Description & Proxy used	Reason for inclusion	Data Source
	Nyere and Wesson (2019) utilised a measure of asset profitability as a proxy for profitability. In their study, Nyere and Wesson (2019) measured profitability through return on assets. For this research, return on assets will be used as a proxy for profitability, as was used by Garcia et al. (2017) and Nyere and Wesson (2019). This study uses "returns" interchangeably with profitability.		
Capital Restriction	The KZ index has been calculated for each company included in the population.	Firms with lower capital restrictions tend to have improved CSR practices (Cheng et al., 2014).	Researcher's calculation based on data from Eikon Datastream

3.2 STATISTICAL ANALYSIS OF DATA

This study will analyse the data through various statistical methods. These include descriptive statistics, regression analysis[7] and K-means cluster analysis.

3.2.1 Regression Analysis

The use of regression analysis to test the hypotheses has been used numerous times in prior literature regarding ESG-related research, with different types of regression analyses being applied depending on the distribution of the data and the number of variables (Garcia et al., 2017; Jansson & Biel, 2011; Przychodzen et al., 2016). Therefore, applying a regression model to determine if a correlation exists between the level of foreign shareholding and ESG scores is appropriate.

The linear model is a regression model used to assess for correlation. This model includes three main assumptions – there is a nil mean and constant variance between the actual and predicted values; the variables are independent of each other; and the data has a normal distribution (Zimprich, 2010). Bounded data represents a restriction of the classic linear regression model (Ferrari & Cribari-Neto, 2004). Therefore, the classic linear model is adjusted to reflect the bounded data, which is achieved by adjusting the model to reflect a beta distribution, as the dependent variable is restricted between zero and one (Zimprich, 2010). The dependent variable, foreign shareholding percentage, is bounded as the shareholding percentage can have a minimum value of zero (0%) and a maximum value of one (100%). The dependent data set has clearly defined minimum and maximum data points, resulting in it exhibiting characteristics of bounded data.

This study used the beta generalised linear mixed effects model (GLMM) to model the relationship between the foreign shareholding percentage of companies and the ESG scores over five years (2015 to 2019). As noted above, the dependent variable (foreign shareholding percentage) is a continuous and bounded variable in that it is bounded at both ends (0-100%). In performing the model analysis, the dependent variable was

[7] The regression analysis as described in Chapters 3 and 4 was performed and written in collaboration with Innocent Karangwa from the University of Cape Town's Department of Statistics. Full ownership for this work cannot be attributed to the researcher in this regard.

converted to values between zero and one. The beta distribution is a family of continuous probability distributions set on the interval [0, 1] having two positive shape parameters. These two parameters appear as exponents of the random variable and manage the shape of the distribution. A logit link function was used to model the responses as a linear combination of the predictor variables. A subject-specific random effect was added to account for the within-subject correlation due to repeated measures. Covariates, predictors, or independent variables in the beta regression model were the ESG scores and control variables. Thus, the beta GLMM that this study used is given by:

$$\boldsymbol{log}\left(\frac{\boldsymbol{\mu}}{\mathbf{1}-\boldsymbol{\mu}}\right) = \boldsymbol{\beta}_0 + \boldsymbol{\beta}_1 overall\_ESG\_score + \boldsymbol{\beta}_2 Returns + \boldsymbol{\beta}_3 Cashflow + \boldsymbol{\beta}_4 Market\_value + \boldsymbol{\beta}_5 Net\_Revenue + \boldsymbol{\beta}_6 KZ\_score + b_i$$

3.2.2 K-Means Cluster Analysis

To further understand the characteristics of the companies included in the population, it was identified as appropriate to analyse the data using a k-means cluster analysis. The analysis is performed through a statistical software programme, Statistica. This analysis first requires that the data be standardised, with a mean of 0 and a standard deviation of 1 (Herbert & Graham, 2022), performed using Statistica. Next, the k-means cluster analysis organises companies into a pre-determined number of clusters. Consistent with the k-means cluster analysis performed by Herbert and Graham (2022), four clusters were determined for this analysis. The clusters are determined by identifying the shortest distance between the mean of each variable for each company and the mean of each cluster as calculated by Statistica (Herbert & Graham, 2022). The analysis is performed for the 2015 and 2019 years under review to determine if common themes or trends exist, and how these changed from the beginning to the end of the observation period.

In conducting the k-means analysis, additional descriptive information was obtained about the companies. This information pertained specifically to the broader industry with which the company is associated, compared to the industry used for the regression analysis (refer to Appendix 2). Similar to the control variable used in the regression analysis, this variable was collected on the same day for both 2015 and 2019, resulting in a limitation in the data. Additionally, the ISIN of the company provides detail as to where the company has its head office located (ISIN Organisation, 2022)

and therefore indicates whether the company may be subject to laws and regulations of a stock exchange and country, in addition to those required by the JSE and South Africa. Therefore, the ISIN is an additional variable, with companies' head office locations indicated as ‘South Africa’ or ‘other’.

3.3 LIMITATIONS OF RESEARCH

This research presents limitations due to the inherent nature of the extracted data. The population was limited to the companies listed on the JSE as of 31 December 2019, for which there was sufficient publicly available data on both Bloomberg and Refinitive Eikon.

This study considers companies operating in a pre-covid environment; therefore, the analysis will not consider factors that arose due to the pandemic. This study is also limited in not considering the during and post-pandemic operating environment. This presents an area for further research to determine if investor behaviour and sentiment have changed due to the COVID-19 pandemic.

This study considered the proxy for foreign investment as the level of shares held by an investor in a foreign country. FPI and FDI both include debt elements in their definitions (International Monetary Fund, 2009). However, this study has only considered foreign investment through its proxy of equity financing and does not consider other measures of FDI, such as loans. This is a limitation of this research, as the dependent variable does not consider these alternate foreign investment measures.

The FTSE Russell provided the ESG scores. This data may be limited in what information the FTSE Russell includes in determining the scores. As such, there is a limitation in the independent variable.

CHAPTER 4 - RESULTS AND DISCUSSION

This chapter discusses the results obtained in conducting the methodology outlined in Chapter 3. The chapter begins by analysing descriptive statistics. It then discusses the statistical work performed through the regression and k-means cluster analyses.

4.1 DESCRIPTIVE STATISTICS

The descriptive statistics of the dataset have been performed to understand how the variables in this study are distributed. Table 5, below, provides detail of this. In addition, the frequency distribution of the data has been included in Appendix 3 by way of box-and-whisker plots and bar graphs where appropriate.

Table 5: Descriptive statistics of the dataset[8]

Variable	Minimum	1st Quartile	Median	Mean	3rd Quartile	Maximum
Foreign Shareholding (%)	0.04	15.51	31.46	33.76	45.37	99.24
Overall ESG Score (out of 5)	1.30	2.80	3.40	3.32	4.00	4.80
Environmental Score (out of 5)	-	2.00	3.00	2.96	4.00	5.00
Social Score (out of 5)	0.50	2.20	3.10	2.96	3.70	5.00
Governance Score (out of 5)	1.70	3.60	4.20	4.09	4.60	5.00
Return on asset, “returns” (%)	- 14.59	2.65	6.62	7.77	10.66	123.26
Free cash flow, “cashflow” (ZAR thousand)	- 38 086 666	2 077 000	4 354 000	16 383 122	12 160 296	260 788 377
Market Value (ZAR million)	5 163	27 331	50 039	163 203	117 972	2 455 722
Net Revenue (ZAR)	- 7 000	18 330 000	41 200 000	109 918 483	84 968 000	3 115 239 678

[8] The descriptive statistics of the category “industry” is not included in Table 5. The data comprising this category is binary in nature, as described in *3. Method*, where a value of 1 was assigned to the company if it operated in a sensitive industry and 0 if not. As such, the determination of descriptive statistics was not considered appropriate for this data set. Of the total data points in the population (265), 205 companies were assigned a value of 0 and 60 were assigned a value of 1.

KZ Score (researcher's calculation)	-7.82	-0.93	0.17	-0.35	1.00	2.45

Due to the skewed nature of the data, the median score is reported rather than the mean score. The median for the overall ESG score was 3.4, with environmental and social scores having a median of 3 and 3.1, respectively, and the governance score having a median of 4.2. The high governance score average is expected. This could be attributed to the fact that South Africa is highly regulated regarding its governance requirements. All companies listed on the JSE are required to apply the principles of the King IV Report (JSE Limited, 2021a). One of the King IV Report's core principles is corporate governance. The Report defines this as "the exercise of ethical and effective leadership by the governing body towards the achievement of the following governance outcomes: ethical culture, good performance, effective control, [and] legitimacy" (Institute of Directors in Southern Africa, 2016, p. 20). Therefore, given the emphasis on South African companies implementing good corporate governance practices, the high governance score median noted in Table 5 is considered reasonable and in line with expectations.

The foreign shareholding percentage has increased from 2015 to 2019, with a slight decline observed in 2017, as observed in Figure 1 of Appendix 3. This increase is observed through the median scores. Similarly, the overall and pillar ESG scores have increased over the five years, per Figures 2 – 5 in Appendix 3. This indicates that, over time, companies appear to improve their ESG practices and related public communication. As observed in the literature, there is a global shift towards sustainability. The release of King IV in 2016 (Institute of Directors in Southern Africa, 2022) may have been a factor in companies moving towards improved ESG practices, thereby translating to higher ESG scores. King IV (Institute of Directors in Southern Africa, 2016) is defined by four philosophies – integrated thinking, the organisation as a key member of society, corporate citizenship, and the stakeholder inclusive approach. This manner of thinking may have triggered the advancement of positive ESG practices in companies' operations.

The movement in foreign shareholding over the five years, as observed in Figure 1 of Appendix 3, is also influenced by factors other than ESG performance. Further

investigations into the decline in 2017 showed the influence of the political and economic circumstances of South Africa towards the end of 2017. In December 2017, there was uncertainty in the political future of South Africa (Hunter, 2017) , which may have resulted in investor concerns (Winning & Stoddard, 2017). South Africa was highlighted has having recently exited a recession in 2017, and had reported an increase of GDP of 0.8%, however recovery of expenditure was identified as being slowed due to public expenditure and fixed investment (United Nations Department of Economic and Social Affairs, 2017). These factors may, either in isolation, or in combination with other factors, have resulted in the apparent decrease in foreign shareholding. However, as this study is not assessing the external environment in which companies operate in, no conclusion is drawn regarding this.

The median scores were assessed over five years to analyse the ESG pillar scores (environmental, social and governance). These are reflected in Table 6 and the figures below.

Table 6: Median scores of the ESG pillar scores over the five years

Pillar category	2015	2016	2017	2018	2019
Governance	3.65	4.00	4.00	4.50	4.50
Environmental	2.25	3.00	3.00	3.50	3.40
Social	2.30	3.05	3.00	3.35	3.70

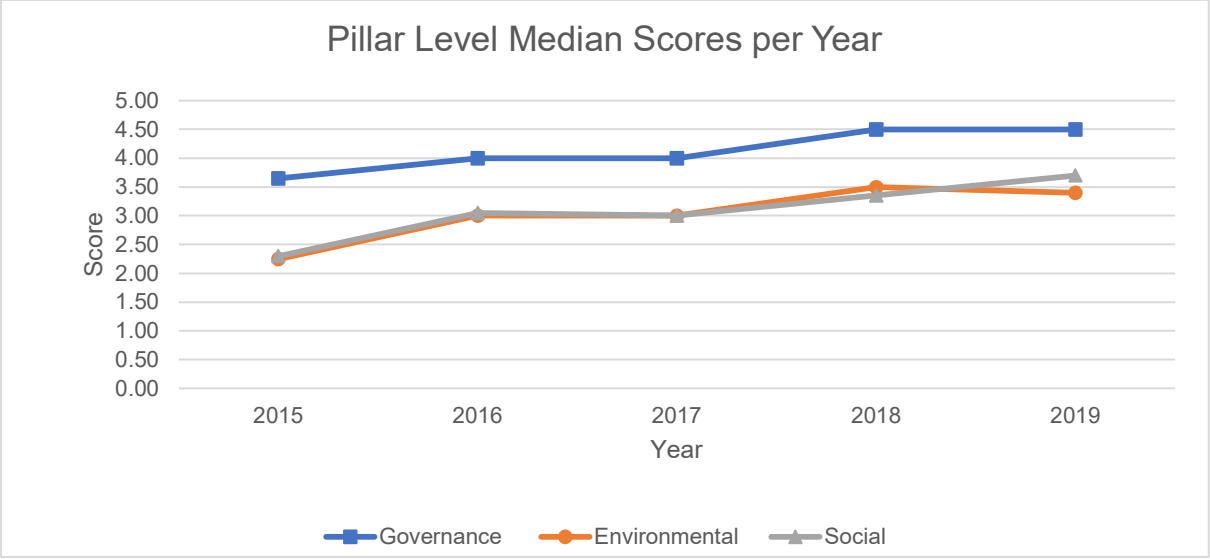

Figure 3: Pillar-level median scores per year

Table 6 and Figure 3 show that the median governance score across the five years ranged from 3.65 in 2015, increasing to 4.50 in 2019. The median governance score has been consistently higher than the environmental and social score, indicating that the companies in the sample have consistently performed well regarding governance. The implementation of the King IV Report in South Africa in 2016 may have influenced the increase observed.

The theme scores were analysed from a descriptive statistics perspective, whereby each theme's median and mean scores were determined over five years (refer to Appendix 4). Many companies were awarded "na" at a theme level. As described in Chapter 3, this rating is applied if the underlying indicators supporting the theme are not relevant for the company, as determined by the FTSE Russell. Therefore, the analysis of this data is to understand some of the trends supporting the pillar and overall scores.

All environmental theme categories exhibited an increasing median score over the period, barring water use, which declined to a median score of 2 in 2019 from 4 in 2018. All social theme categories reflected an increase in the median score except for health and safety, which remained constant at a median score of 3. Further analysis of the themes comprising the Governance pillar revealed that Corporate Governance had the highest median score across the five years, scoring 5 in each year assessed. Although this study performed no further statistical work on the theme scores, the increasing trends observed for the scores generally support the increasing ESG scores observed for the pillar and overall scores, implying that companies are improving their ESG practices and reporting thereof.

The descriptive statistics of the control variables resulted in no correlation identified between the control variables and the dependent variable, the foreign shareholding percentage. This has been illustrated further in Figures 4 - 9 below.

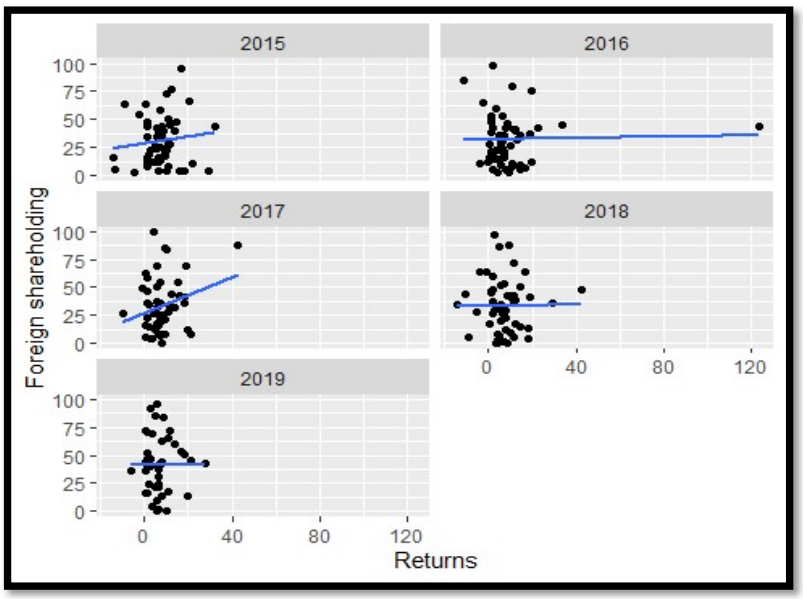

Figure 4: Association between foreign shareholding and return on assets

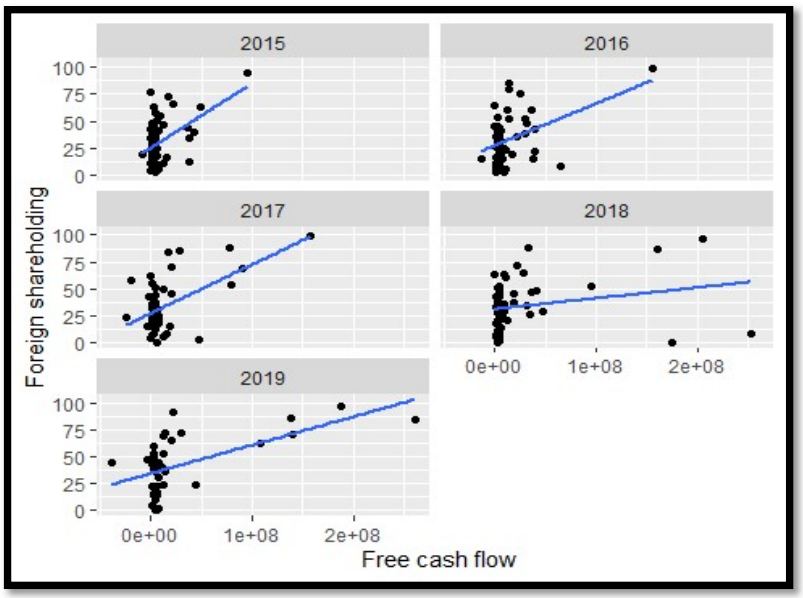

Figure 5: Association between foreign shareholding and free cash flow

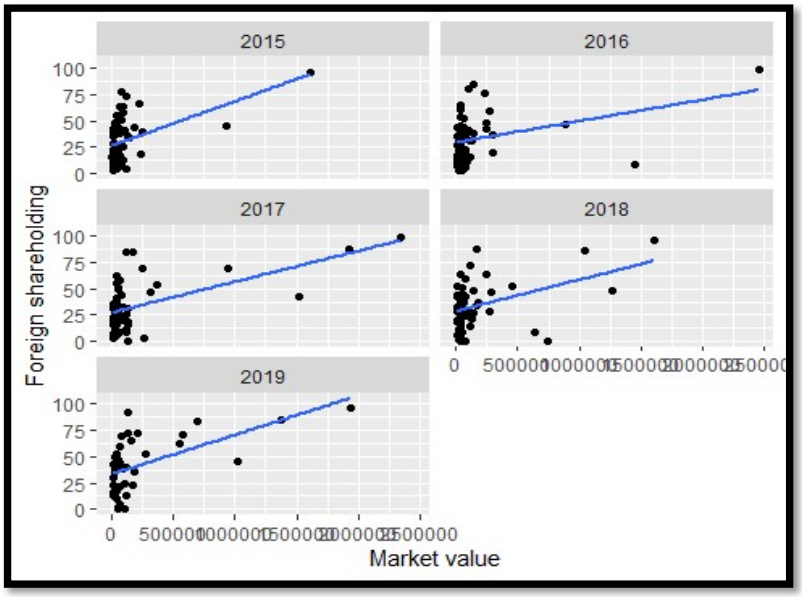

Figure 6: Association between foreign shareholding and market value

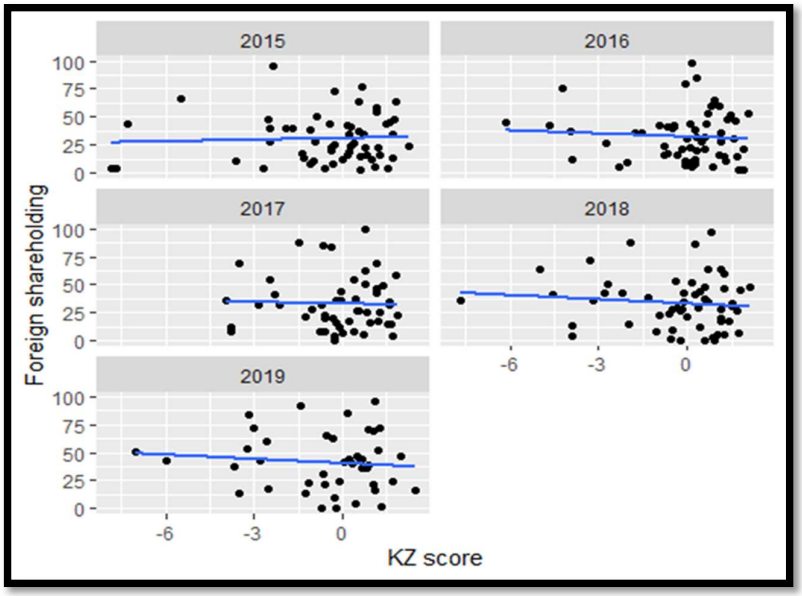

Figure 7: Association between foreign shareholding and KZ index score

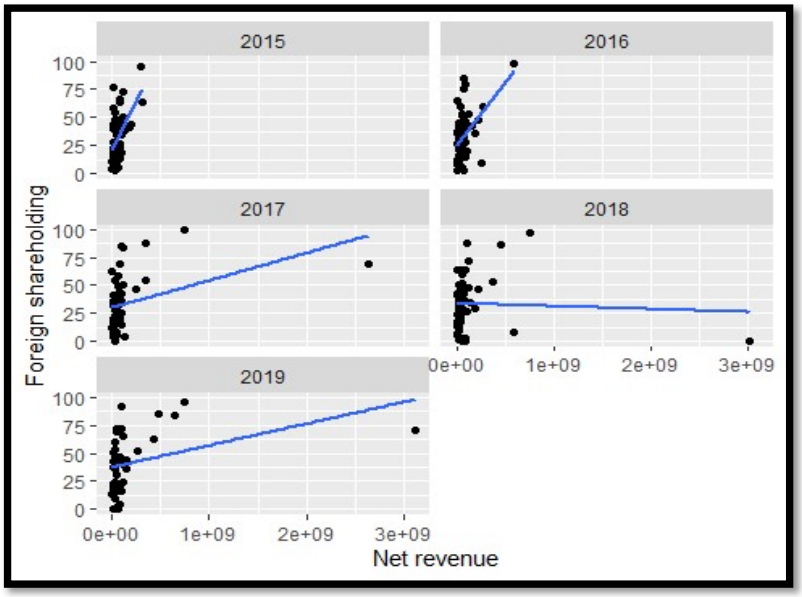

Figure 8: Association between foreign shareholding and net revenue

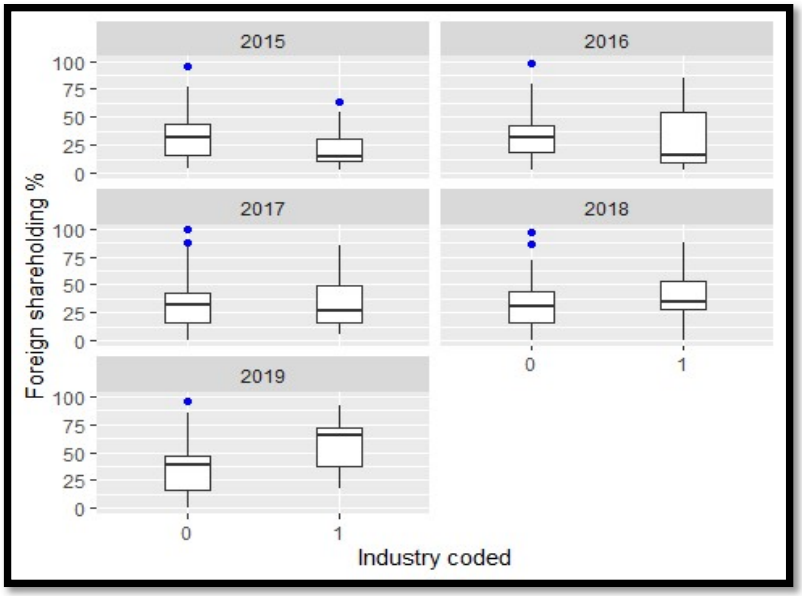

Figure 9: Association between foreign shareholding and categorised industries

Figures 4 - 9 above demonstrate the association between the foreign shareholding of companies and the related control variables, performed through bivariate analysis. As illustrated, no linear association is identified in any of the figures. Regarding Figure 9, the box-and-whisker graph was performed to assess whether foreign shareholding varied across the non-sensitive and sensitive industries, represented by 0 and 1,

respectively. No further analytical work was performed on the control variables due to the lack of linear association identified.

4.2 REGRESSION ANALYSIS

This study used a regression analytical approach to understand the data further and identify if there was a significant correlation between ESG scores and the foreign shareholding percentage. The detailed results of the models have been included in Appendix 5.

4.2.1 Overall ESG Score

A positive and significant association was observed when testing the relationship between the overall ESG score and the foreign shareholding percentage. This is illustrated in Table 7, whereby the p-value for the overall score regression analysis (0.0173) is less than 0.05 and is also shown in Figure 10 below.

Table 7: Statistical results of a simple regression analysis (each variable against foreign shareholding)

Predictor	Estimate	Std. Error	Z Value	P-value	Conclusion
Overall Score	0.22	0.09	2.38	0.0173*	Accept
Environment Score	0.18	0.06	2.79	0.0053*	Accept
Social Score	0.18	0.07	2.46	0.0138*	Accept
Governance Score	0.06	0.09	0.56	0.549	Reject

*: Statistically significant at 5% level (p-value < .05)

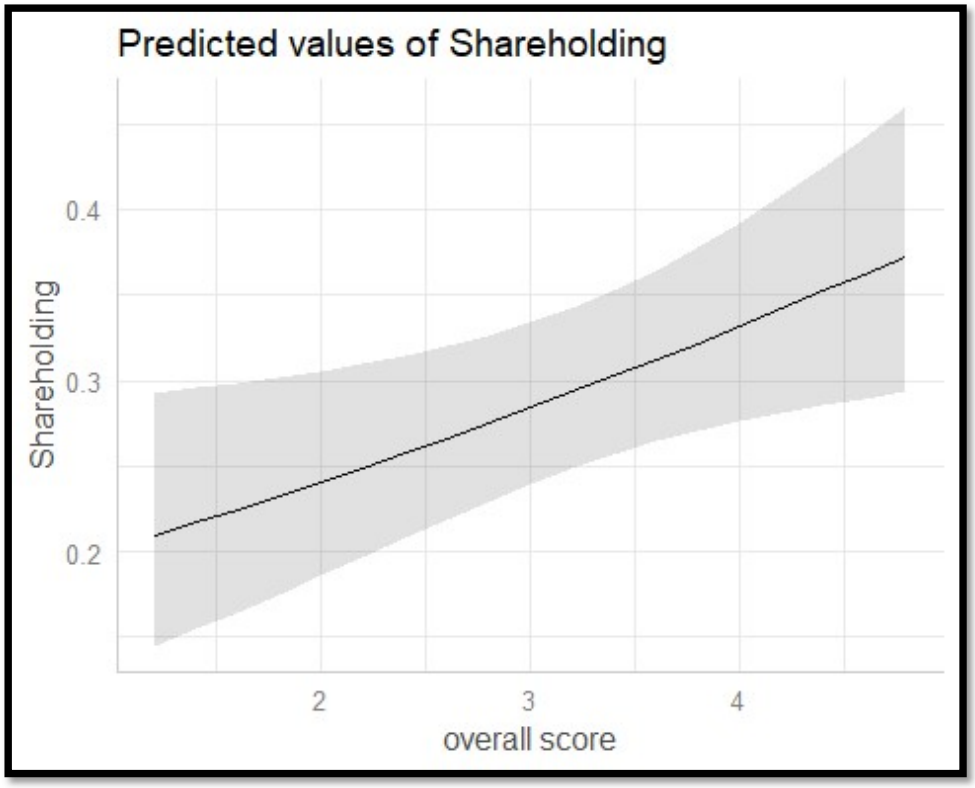

Figure 10: Association between overall ESG score and foreign shareholding percentage when other variables are held constant

The strong association per Figure 10 indicates that an increase in the overall ESG score will also increase the foreign shareholding percentage. The strong association observed allows the H1 hypothesis to be accepted. The model provides evidence of correlation; however, causation has not been tested in this study.

To determine if the increase in foreign shareholding is a result of a combination of the ESG score and other variables, the control variables identified in the literature review have been included in the regression model. This model's result is illustrated in Table 8 and Figure 11 below.

Table 8: Regression analysis results of overall ESG score with control variables

Predictor	Estimate	Std. Error	Z Value	P-value	Conclusion
Overall Score	0.03836	0.14906	0.257	0.7969	Not significant
Log (Returns)	-0.04174	0.13774	-0.303	0.7618	Not significant
Log (Cashflows)	0.05134	0.15160	0.339	0.7349	Not significant
Log (Market value)	0.30620	0.13965	2.193	0.0283	Significant
Log (Net Revenue)	0.10627	0.16717	0.636	0.5250	Not significant
Log (KZ score)	0.03026	0.12255	0.247	0.8050	Not significant
Industry Coded	-0.20556	0.32636	-0.630	0.5288	Not significant

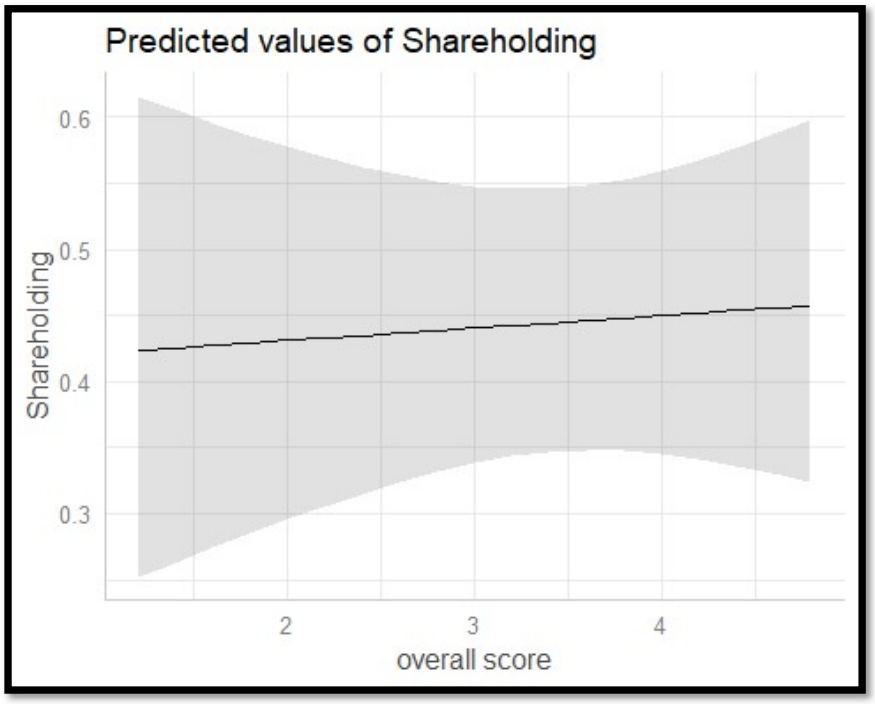

Figure 11: Association between overall ESG score and the foreign shareholding percentage, when assessed with control variables

Table 8 demonstrates that when the overall ESG score is assessed with a combination of control variables, the significant association noted in Table 7 and Figure 10 is no longer evident. This is illustrated through Figure 11, which depicts the lack of

association between the ESG overall score and the percentage of foreign shareholding of companies. The control variables were tested with the overall ESG score in the regression model to determine if the relationship noted between foreign shareholding and ESG overall score is influenced further by the identified control variables. No association was identified (refer to Figure 11), and the regression model resulted in no significant relationship being identified for the overall score (refer to Table 8). As such, this study concludes that the positive relationship observed in Table 7 is not reliant on the control variables to exist.

The positive and significant correlation observed between foreign shareholding and the overall ESG scores contributes to the existing literature on investor behaviour, as identified by Przychodzen et al. (2016), Jansson and Biel (2011) and Alda (2019). Investors, particularly in the foreign market in which the existing literature has performed their analyses, appear to be investing in companies with higher ESG performance scores. A shift in the behaviour of investors has been observed, noting that investors are including ESG criteria in their investment-making decisions. The increasing ESG score could be a result of companies taking the needs of the stakeholders into account, towards which the global investor market is responding positively. This aligns with stakeholder theory and, as such, serves as positive evidence towards stakeholder theory.

4.2.2 Pillar Scores – environmental, social and governance

As discussed above, a positive and significant association was noted between the overall ESG score and the foreign shareholding percentage. The underlying pillars were tested against the regression model to determine the relationship of the ESG constituents with the foreign shareholding percentage of companies.

The results of the GLMM, detailed in Table 7 above, identified a significant and positive correlation between the foreign investment percentage and the environmental and social scores only, as the p-value for the overall score, environmental score, and social score were less than 0.05, as indicated in Table 7. No correlation was observed for governance scores. As such, hypotheses H2a and H2b are accepted due to the significant correlation being identified, whilst the H2c hypothesis is rejected because no significant correlation was identified.

The lack of correlation observed for the governance scores could be explained through South Africa's history in corporate governance practices, as detailed in Chapter 2. South African companies are guided by the principles of the King IV Report. The King Reports (I through IV) shared recurring themes of what 'good corporate governance practices' look like and how companies should implement these. This implies that the time in which the King Reports have been in existence should theoretically have influenced how companies implement their corporate governance practices. As a result, the governance-score descriptive data, as presented in Table 5, has a higher median than the environmental and social categories, reflecting a more mature approach to corporate governance by companies compared to their social and environmental counterparts. As such, investors may not be placing as much value on the governance component, given the expectation that it should already be at a high standard.

Model 2 of Appendix 5 assessed the three pillar scores against the foreign shareholding percentage to determine if any of the three scores were significant due to a combination of each other. This analysis was performed as a significant and positive relationship was identified for the separate environmental and social scores, as shown in Table 7. The results of Model 2 identified no association between any of the pillar scores and the foreign shareholding percentage. These results show that the environmental and social scores do not increase in combination with each other and can be assessed independently.

The conclusions obtained for each hypothesis reveal that investors consider different aspects of ESG to be more relevant. Jansson and Biel (2011) identified that investors do not all share similar investor profiles. Similarly, this study identified that some investors place more value on specific components of ESG than others, with foreign investors valuing the overall score, environmental score, and social score more than the governance score. As with Jansson and Biel (2011), understanding what foreign investors are seeking can aid companies in establishing sound ESG practices in those areas to attract foreign investment.

4.3 K-MEANS CLUSTER ANALYSIS

A k-means cluster analysis was conducted for 2015 and 2019. This was done to determine if key characteristics could be identified regarding companies that invest in ESG and those that do not have as high ESG scores.

4.3.1 K-means cluster analysis - 2015

Figures 12 and 13 highlights the clusters and industries associated with each cluster for 2015. An analysis has been performed for each cluster obtained for 2015 below.

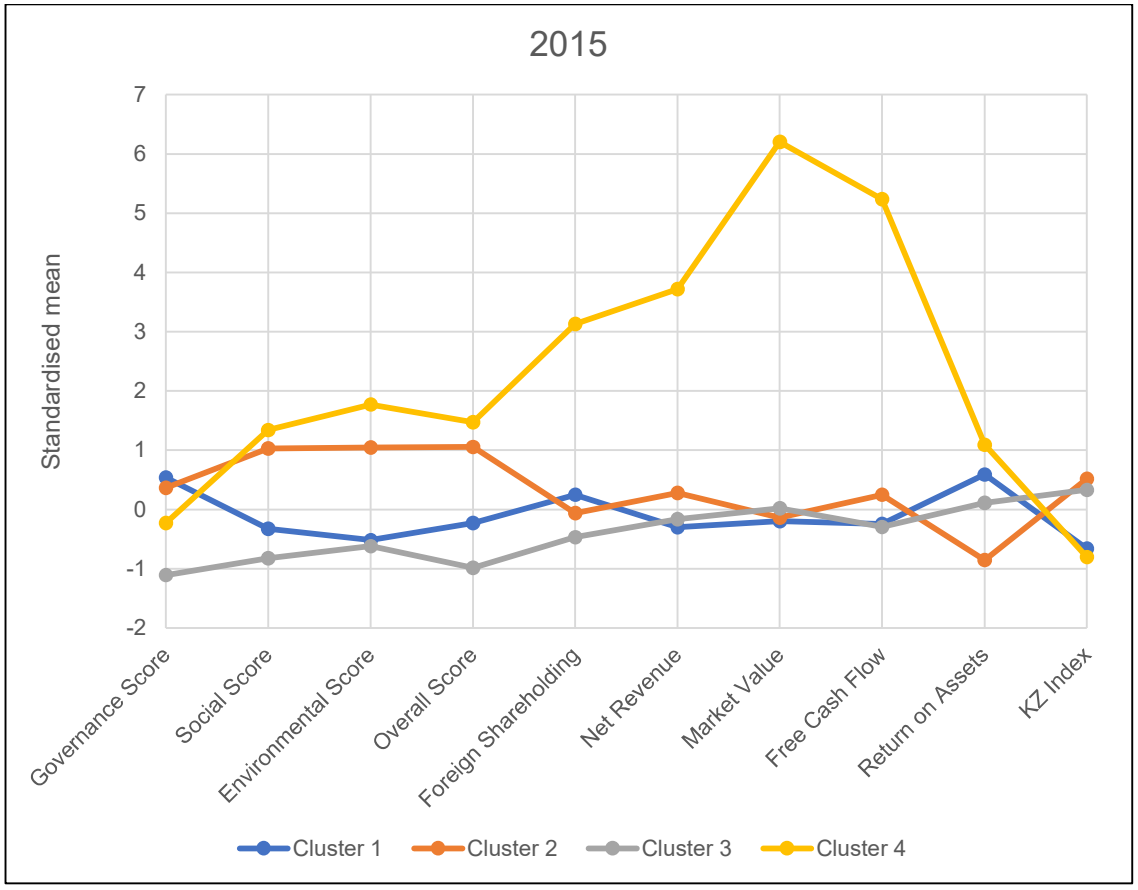

Figure 12: K-means cluster analysis - 2015

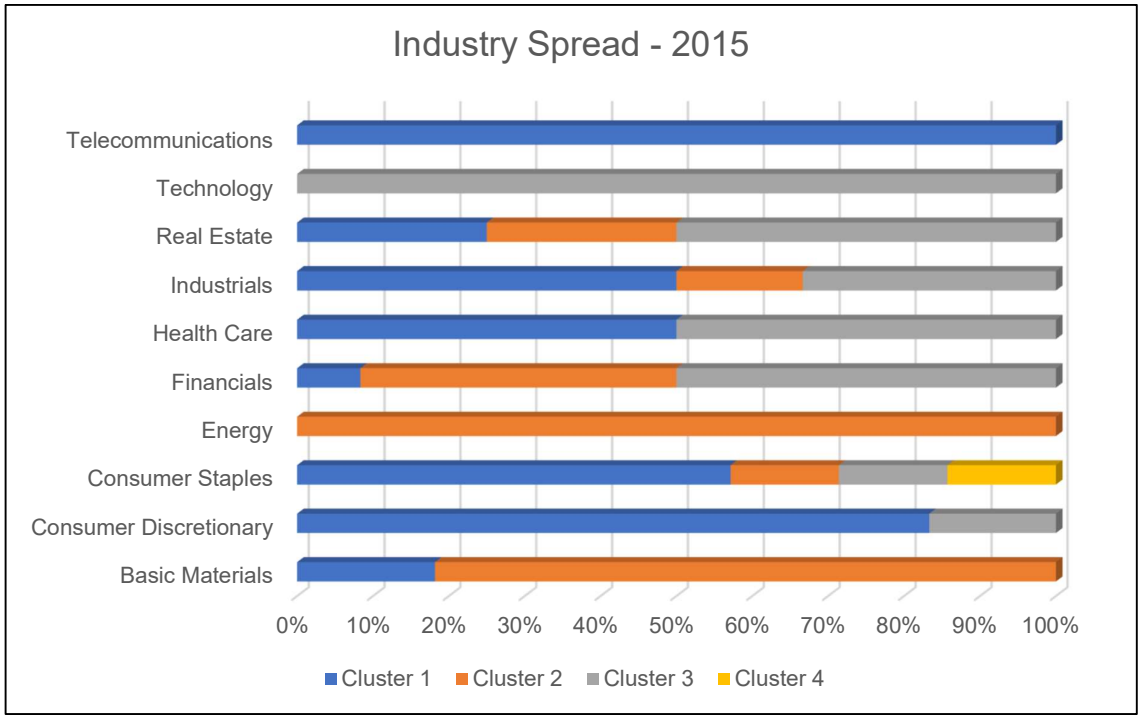

Figure 13: Industry spread - 2015

For the 2015 year, companies were grouped into the following clusters by Statistica:

Cluster 1: Consumer-based companies operating predominantly in South Africa

Cluster 1 comprises companies with head offices in South Africa predominantly. However, they have a higher foreign shareholding than Cluster 2 and 3, with an average foreign shareholding of 38.6% and a median of 39.8% (Cluster 2 mean of 32.4% and median of 24.9%; and Cluster 3 mean of 24.4% and median of 22.5%). In addition, these companies are characterised by high governance scores (median of 4) and low environmental scores (median of 2). The companies in this cluster operate mainly in the following sectors – telecommunications, consumer discretionary and consumer staple. In isolation, this cluster does not align with the hypothesis that an increase in ESG score increases foreign shareholding. However, compared to Cluster 3, which has a median foreign shareholding of 22.5% and a median overall ESG score of 2.10, Cluster 1 aligns more appropriately with the hypothesis.

Cluster 2: Companies with high ESG scores, lower profitability, and low foreign shareholding

Cluster 2 comprises companies headquartered in South Africa and those headquartered outside of South Africa. Additionally, they operate mainly in industries such as basic materials and energy. The low profitability indicator (return on assets) and high KZ index, as observed in Figure 12, highlight the risky and fluctuating nature of these industries (basic materials and energy) that may be influenced by commodities pricing. These companies have a median overall ESG score of 3.6, with a median governance score of 4.2, a median social score of 3.3 and a median environmental score of 3.8. Given the industry in which these companies operate, it is expected that they will have higher ESG scores because they disclose additional information from operating in sensitive industries. This aligns with Herbohn et al. (2014), who identified a positive relationship between sustainability performance and disclosure for Australian companies operating in the energy and mining sector.

Cluster 3: Companies with low ESG scores and low foreign shareholding

Cluster 3 comprises various industries, including technology, real estate, financials and health care. All the companies within this cluster were headquartered in South Africa. This is supported by the lower foreign shareholding percentage observed. The median foreign shareholding for Cluster 3 is 22.5%, with a median overall ESG score of 2.1. This cluster supports the regression analysis results and supports hypothesis H1, whereby an increased overall ESG score is associated with an increased foreign shareholding percentage. In this cluster, the inverse is depicted, whereby a lower foreign shareholding percentage is matched with lower ESG scores. As all these companies are headquartered in South Africa, as indicated by their ISIN, the obligation on the companies to implement and report on ESG factors is not present. Integrated reporting, however, requires companies to disclose information on the six capitals, which looks beyond financial aspects (IIRC, 2021). Stakeholder theory expects companies to consider all stakeholders. Therefore, it is expected that companies would consider their underlying ESG-related and ultimately make public disclosure of this in the integrated reports. This cluster does not support this theory and suggests that companies may be led by their compliance obligations.

Cluster 4: Companies with high ESG scores and high profitability factors

Cluster 4 consists of only one company operating in the Consumer Staples sector. The company is not headquartered in South Africa, as evidenced by the lack of ZAE in its ISIN. The company has a high foreign shareholding (95.5%) and high overall ESG scores (4). The cluster outperforms the remaining clusters in all profitability aspects, including market value, net revenue and return on assets. Additionally, the cluster has the lowest KZ index, a positive indicator of its reliance on capital. Like Cluster 3, this cluster supports the finding that companies with high ESG scores have high foreign shareholding percentages. Again, similar to Cluster 3, this could result from the country's legislative requirements in which the company is headquartered.

4.3.2 K-means cluster analysis - 2019

The k-means cluster analysis was performed for 2019 to determine if trends or themes can be established compared to 2015. Figures 14 and 15 highlights the clusters and industries associated with each cluster for 2019.

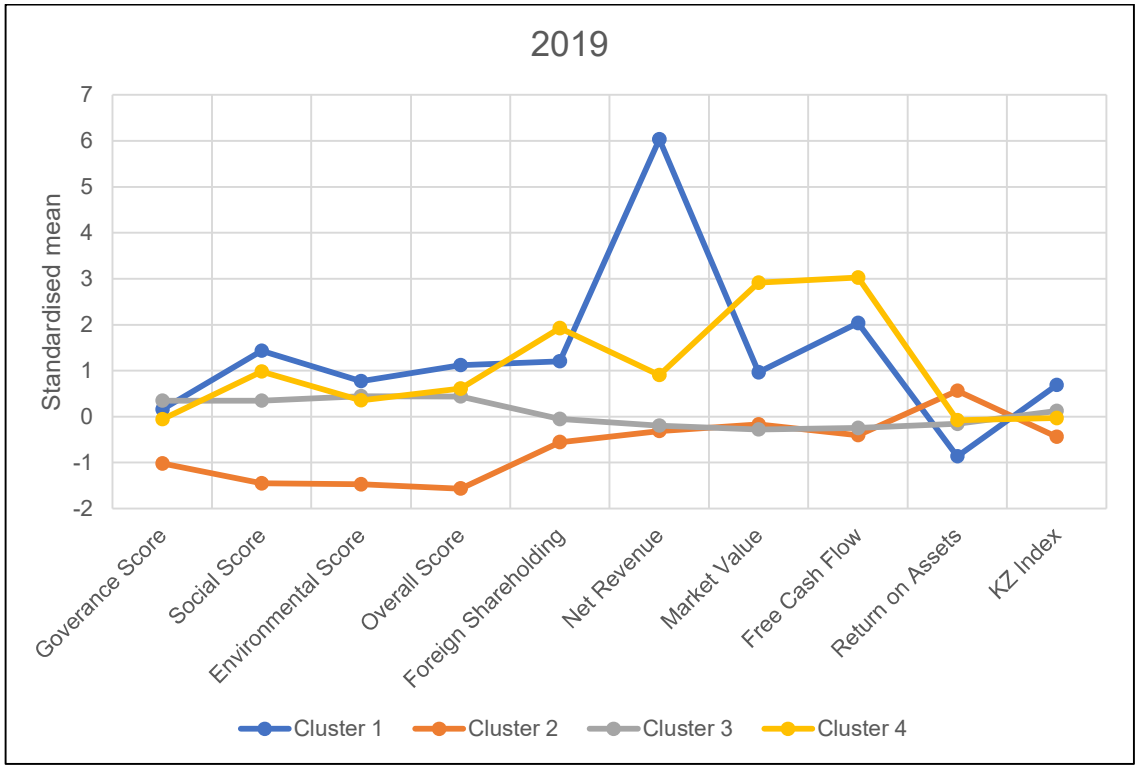

Figure 14: K-means cluster analysis - 2019

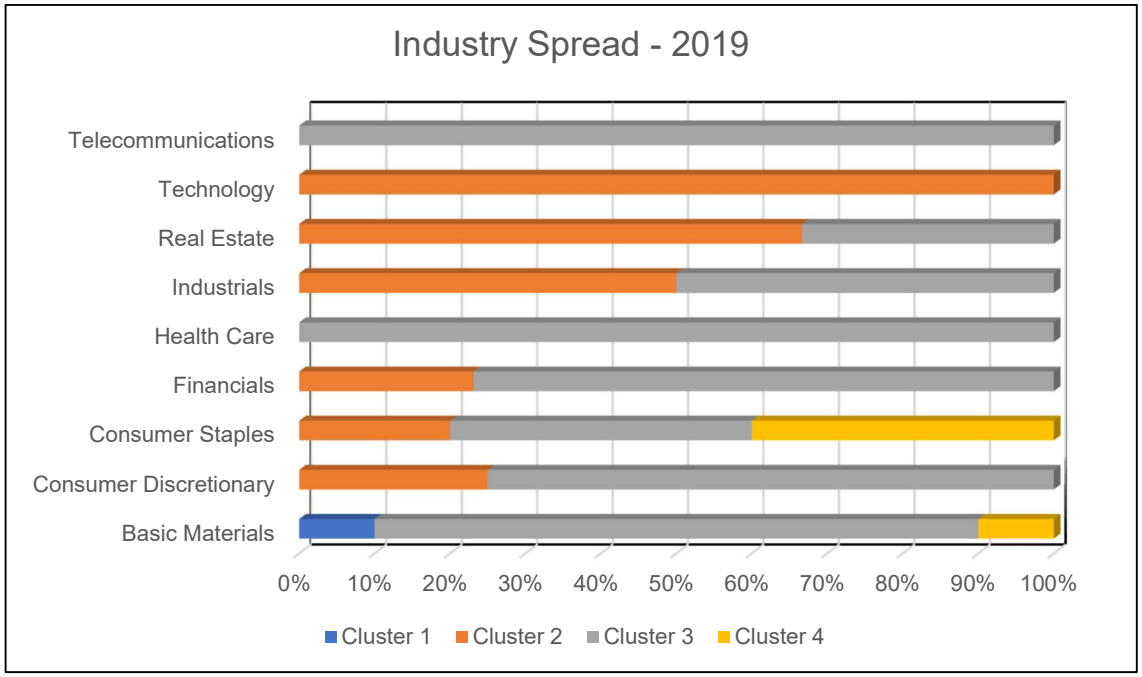

Figure 15: Industry spread - 2019

For the 2019 year, companies were grouped into the following clusters by Statistica:

Cluster 1: Company with foreign headquarters in the Basic Materials sector

Cluster 1 comprised only one company, with a foreign headquarters that operates primarily in the basic materials sector and has high net revenue generation. The high net revenue and ESG scores can be explained by the industry in which the company trades (basic materials). This cluster has an overall ESG score of 4.5, an environmental score of 4.2, a social score of 4.7 and a governance score of 4.5. The foreign shareholding percentage of this cluster is 71.1%. The foreign headquarters of this company, coupled with the sector, may influence the ESG practices of the organisation, with the foreign headquarters potentially influencing the level of foreign shareholding of the company. As such, the cluster supports the hypothesis that an increase in ESG score increases foreign shareholding.

Cluster 2: Companies with low ESG scores and high profitability

Cluster 2 comprises companies with head offices in South Africa, operating mainly in the technology, financials, real estate, consumer staple and consumer discretionary industries. Although the nature of the industries may indicate that companies do not

need to implement ESG practices, the methodology employed by the FTSE Russell in calculating the ESG scores takes this into account. A weighting system is used whereby an exposure level is determined for each industry and consequently applied to the score, affecting which scores are more heavily weighted than others (FTSE Russell, 2019). Therefore, it appears that these companies are performing lower than expected by the foreign shareholders. This is supported by this cluster's low foreign shareholding percentage, which is also the lowest across the four clusters (median foreign shareholding percentage of 32.7%). Similar to the finding for the 2015 analysis, the lower ESG scores for companies headquartered in South Africa may be a result of the legislative environment of these companies, whereby ESG practices and the reporting thereof are not mandated. This cluster supports the hypothesis that an increased ESG score increases foreign shareholding percentage.

Cluster 3: Companies with high ESG scores and lower foreign shareholding

This cluster comprised most companies in the 2019 population (29 of 43). The industry spread of these companies covered a wide range, with the majority being in financials and basic materials. These companies had relatively high ESG score medians and higher foreign shareholding percentages compared to Cluster 2. The median overall ESG score for this cluster was 4, compared to Cluster 2's, 2.5. Similarly, Cluster 3 had a median foreign shareholding of 39.1% compared to 32.7% for Cluster 2. Only five companies were identified as having headquarters not in South Africa for Cluster 3; however, the median foreign shareholding of the Cluster 3 companies, after removing the foreign listed companies, is 36%, with a median overall ESG score of 3.9. Both these figures exceed that of Cluster 2, indicating that the head office location of the companies within Cluster 3 is not necessarily the primary reason for the higher averages obtained. The core distinction between Cluster 2 and 3 appears to rest in the industries in which the underlying companies operate. Cluster 3 is centred around financials and basic materials, whereas Cluster 2 is largely financials, industrials, and real estate. Cluster 3 exceeds Cluster 2 in both ESG scores and foreign shareholding. On that basis, Cluster 3 aligns with the H1 hypothesis. However, in considering the location of headquarters of companies and their industries, it appears that industry may be a factor influencing Cluster 3. This aligns with the finding of Herbohn et al. (2014), where a positive relationship between sustainability disclosure and performance of

companies operating in the energy and mining sector was identified. It appears that the companies operating in more sensitive industries are more likely to disclose their sustainability practices. This is supported by the findings of Garcia et al. (2017), whereby companies operating in sensitive industries have better ESG performance than non-sensitive industries. Further research should be conducted at an industry level to determine if sector-specific characteristics affect the hypothesis.

Cluster 4: Foreign headquartered companies with high market value and ESG scores

These companies operate primarily in the consumer staples and basic material industries. The companies have high median ESG scores (Governance 4.7; Social 4.3 and Environmental 3.8 with an Overall score of 4.4), correlated with high foreign shareholding percentages, with a median of 85.2%, supporting hypothesis H1. The increased foreign shareholding percentage noted for this cluster can be attributed to the companies' headquarters being outside South Africa. Similarly, the higher ESG scores may result from foreign jurisdictions imposing stricter ESG compliance regulations on these companies.

4.3.3 Summary

When comparing the clusters for 2015 and 2019, similar themes were identified. Companies with foreign headquarters tend to have higher foreign shareholding percentages but also generally have higher ESG scores. This could result from foreign countries imposing stricter ESG measures that these companies must comply with and report on. In general, it was observed that companies based in South Africa have lower ESG scores, coupled with lower foreign shareholding percentages. Linking this with what was observed for foreign companies, the legislative environment in South Africa could be a driving force behind companies' actions to implement better ESG practices. In addition, the literature on foreign investor behaviour reveals that these investors are shifting their criteria to be more inclusive of ESG practices (Alda, 2019; Jansson & Biel, 2011; Przychodzen et al., 2016), which may also drive increased ESG practices in the foreign companies. Overall, the clusters reveal alignment with hypothesis H1, that an increase in ESG scores increases foreign shareholding.

CHAPTER 5 - CONCLUSION AND RECOMMENDATIONS

5.1 SUMMARY OF FINDINGS

This study sought to determine if there is a correlation between the foreign shareholding percentage and the ESG score of companies listed on the JSE in a pre-COVID trading environment. Financial flows to South Africa are negatively affected by several variables, including credit rating downgrades (Takawira & Motseta, 2021). The decline in FDI inflows to South Africa was partially attributed to the COVID-19 pandemic (UNCTAD, 2021), with the 2021 inflows representing a skewed increase as it was influenced by an interfirm transaction across borders (UNCTAD, 2022). Investors in the foreign market are shifting towards a holistic approach to investing, with research demonstrating that investors are including ESG criteria in their investing-making decisions (Alda, 2019; Jansson & Biel, 2011; Przychodzen et al., 2016). Stakeholder theory assumes that companies consider all relevant stakeholders, not only their shareholders (Freeman, 2010).

The generalised linear mixed effects model results allowed the overall hypothesis (H1) to be accepted with a significant and positive association between the overall ESG score and the foreign shareholding percentage obtained. A similar conclusion was obtained for the environmental (H2a) and social (H2b) hypotheses. On the other hand, the governance hypothesis (H2c) was rejected, implying a lack of association between the governance pillar scores and the foreign shareholding percentage of companies. This could be attributed to the governance practices companies are mandated to apply as part of their listing on the JSE (JSE Limited, 2021a), whereby companies must apply the governance principles as per the King Report.

The regression analysis provides evidence for the management of JSE-listed companies to invest in practices promoting ESG values to encourage foreign investment into their companies. Additionally, this study adds value as it can aid the government in implementing policies for companies to incorporate ESG practices to increase foreign investment to South Africa. As evidenced by the research performed by Jansson and Biel (2011), investor profiles differ greatly, with different investor groups prioritising ESG for various reasons. This behaviour should be incorporated

into the strategic planning by South African companies to determine methods of increasing foreign funding through uplifting their environmental and social practices.

The k-means cluster analysis revealed that companies with foreign headquarters generally tend to have increased foreign shareholding percentages and higher ESG scores. This result could be used to justify the need for governments to implement mandatory ESG legislation that requires companies to implement and disclose appropriate ESG practices, as the legislative environment may impact companies in their transition towards ESG.

5.2 OPPORTUNITIES FOR FURTHER RESEARCH

Opportunities for further research exist in expanding this research to assess if the same conclusion can be made for a post-COVID trading environment. In addition, the passage of time may also result in changes to the regulatory environment, causing companies to alter their actions in line with legislation. Therefore, further research should be performed to determine if such events may influence the relationship between ESG performance and foreign investment in South Africa.

This research only considered foreign shareholding percentage as a measure of foreign equity investment (FDI and FPI). To further assess the relationship between ESG performance and foreign investment, additional research could be undertaken to incorporate other proxies for foreign investment.

The investor profiles identified by Roundy et al. (2017) were not applied to this research, as this study does not conclude on the motives of the types of foreign investors behind their investment choices. As such, this is outside of the scope of this study. However, this is an opportunity for further research and can provide insight into investors' rationale for considering ESG factors in their investment portfolios.

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APPENDIX

APPENDIX 1

The KZ index indicates if a company is experiencing capital constraints. This study follows the methodology of Cheng et al. (2014), where the ESG performance of companies was assessed against the level of capital constraint. The study conducted by Cheng et al. (2014) further defined capital constraints using the KZ index. For this study, a similar index was developed and used to assess if there is a relationship between the KZ index, as a measure of capital constraint, and the independent and dependent variables, ESG performance and foreign shareholding percentage, respectively. The KZ index was developed by Kaplan and Zingales as a measure of capital constraint (Cheng et al., 2014). The index relies on five variables combined in a formula, as Kaplan and Zingales (1997) determined.

The KZ index is determined as follows (Cheng et al., 2014):

$$KZ\ index = -1.002\ CF / A_{-1} - 39.368\ DIV / A_{-1} - 1.315\ C / A_{-1} + 3.139\ LEV + 0.283\ Q$$

In defining the variables, the underlying literature of Baker, Stein and Wurgler (2003) and Lamont, Polk and Saá-Requejo (2001), which Cheng et al. (2014) relied on to calculate their KZ index, was referred. The variables have been defined as follows:

Variable	Prior literature	Data definition	Data source	Source code/reference
CF / A_{-1} (Cash flow over lagged assets)	Cash flow is defined as income before extraordinary items, depreciation, and amortisation (Baker et al., 2003; Kaplan & Zingales, 1997; Lamont et al., 2001). Lagged assets refer to total assets at the start of the period. Total assets were preferred by Baker et al. (2003) over the original property, plant and equipment as was done in prior literature (Kaplan & Zingales, 1997; Lamont et al., 2001), to account for non-manufacturing companies that were included in the sample.	<u>Funds from Operations</u> "Sum of net income and all non-cash charges or credits". <u>Total assets (prior year)</u> "Sum of total current assets, long-term receivables, investment in unconsolidated subsidiaries, other investments, net property plant and equipment and other assets".	Datastream - Worldscope	Funds from operations – WC04201 Total assets – WC02999

DIV / A_{-1} (Cash dividends over lagged assets)	Cash dividends was defined in prior literature as total common and preferred dividends (Baker et al., 2003; Lamont et al., 2001).	<u>Total cash dividends paid</u> "Total common and preferred dividends paid to shareholders of the company. Excludes dividends paid to minority shareholders". <u>Total assets (prior year)</u> "Sum of total current assets, long term receivables, investment in unconsolidated subsidiaries, other investments, net property plant and equipment and other assets".	Datastream - Worldscope	Cash dividends paid total – WC04551 Total assets – WC02999
C / A_{-1} (Cash balance over lagged assets)	Cash balances refer to both cash and short-term investments (Baker et al., 2003; Lamont et al., 2001).	<u>Cash and cash equivalents</u> "Cash and due from banks (Banks); Cash (Insurance Companies); Cash and Short term investments (all other industries)".	Datastream - Worldscope	Cash & Equivalents – WC02005 Total assets – WC02999

		Total assets (prior year) "Sum of total current assets, long term receivables, investment in unconsolidated subsidiaries, other investments, net property plant and equipment and other assets".		
LEV (Leverage)	The leverage ratio is calculated as the total current and non-current debt divided by total capital, being total current and non-current debt and total shareholder's equity (Baker et al., 2003; Lamont et al., 2001).	Total debt "All interest bearing and capitalised lease obligations. It is the sum of long and short term debt". Total equity (total assets less total liabilities) Total assets – "Sum of total current assets, long term receivables, investment in unconsolidated subsidiaries, other investments, net property plant and equipment and other assets".	Datastream - Worldscope	Total debt – WC03255 Total assets - WC02999 Total liabilities – WC03351

		Total liabilities - “all short and long term obligations expected to be satisfied by the company”.		
Q (Tobin’s Q)	Tobin’s Q is defined as the “market value of assets divided by the book value of assets” (Kaplan & Zingales, 1997, p. 177). Market value of assets is further defined as the “book value of assets plus the market value of common equity less the sum of the book value of common equity and balance sheet deferred taxes” (Kaplan & Zingales, 1997, p. 177). This was calculated as follows: (Market capitalisation + total assets – (total equity + deferred tax balance) / Total assets	<u>Market capitalisation</u> “Market price-year end * common shares outstanding”. <u>Total assets</u> “Sum of total current assets, long term receivables, investment in unconsolidated subsidiaries, other investments, net property plant and equipment and other assets”. <u>Total equity (total assets less total liabilities)</u> Total assets – “Sum of total current assets, long term receivables, investment in unconsolidated subsidiaries, other	Datastream - Worldscope	Market capitalisation – WC08001 Total assets - WC02999 Total liabilities – WC03351 Deferred taxes credit – WC18183 Deferred taxes debit (WC18184)

	This value is calculated at the beginning of the period. These figures were determined by extracting the previous calendar year-end figures from Datastream, as per Kaplan and Zingales (1997).	investments, net property plant and equipment and other assets". Total liabilities – "all short and long term obligations expected to be satisfied by the company". Net deferred tax liability (deferred tax credit less deferred tax debit) Deferred tax credit – "credit balance of the deferred tax account". Deferred tax debit – "debit balance of the deferred tax account" .		

APPENDIX 2

The table below provides the definitions of the control variables obtained from Refinitive Eikon Datastream.

Variable	**Definition**	**Source**	**Source code/reference**
Industry	Two key types of industries were identified for analysis in this study. In the regression analysis, the control variable "industry" was defined as the ICB Sector Names (ICBSN) obtained from Datastream. This is the FSTE/DJ Industry Classification Benchmark that identifies 41 sectors. This industry-level classification was deemed appropriate for its granular level of detail for the allocation of sensitive industries. In performing the k-means analysis, a broader "industry" measure was utilised to group the industries appropriately. The ICB Industry Name (ICBIN), as determined by the FTSE/DJ Industry Classification Benchmark, was used. This measure has a total of ten industries identified. This was also obtained from Datastream.	Datastream	ICBSN ICBIN

Net Cash Flow – Operating Activities (proxy for Free cash flow)	Net cash receipts and disbursements resulting from the operations of the company. It is the sum of Funds from Operations, Funds From/Used for Other Operating Activities and Extraordinary Items.	Datastream Worldscope	DWFC
Market value (proxy for company size)	The share price multiplied by the number of ordinary shares in issue.	Eikon Datastream	MV
Net revenue (proxy for company size)	<u>Non-financial companies:</u> Gross sales and other operating revenue less discounts, returns and allowances. <u>Financial companies:</u> Total operating revenue	Worldscope	WC1001
Return on assets (proxy for profitability)	<u>Industrials:</u>	Worldscope	WC08326

	(Net Income – Bottom Line + ((Interest Expense on Debt-Interest Capitalized) * (1-Tax Rate))) / Average of Last Year's and Current Year's Total Assets * 100 <u>Banks</u>: Net Income – Bottom Line + ((Interest Expense on Debt-Interest Capitalized) * (1-Tax Rate))) / Average of Last Year's (Total Assets - Customer Liabilities on Acceptances) and Current Year's (Total Assets - Customer Liabilities on Acceptances) * 100. Customer Liabilities on Acceptances only subtracted when included in Total Assets <u>Insurance Companies:</u> (Net Income – Bottom Line + ((Interest Expense on Debt-Interest Capitalized) *(1-Tax Rate))) + Policyholders' Surplus) / Average of Last Year's and Current Year's Total Assets * 100 <u>Other Financial Companies:</u> (Net Income – Bottom Line + ((Interest Expense on Debt-Interest Capitalized) * (1-Tax Rate))) / Average of Last Year's (Total Assets -		

	Custody Securities) and Current Year's (Total Assets - Custody Securities) * 100"		

APPENDIX 3

The following Box-and-whisker / bar graphs diagrams describe the distribution of each variable across the five years under review, from 2015 to 2019.

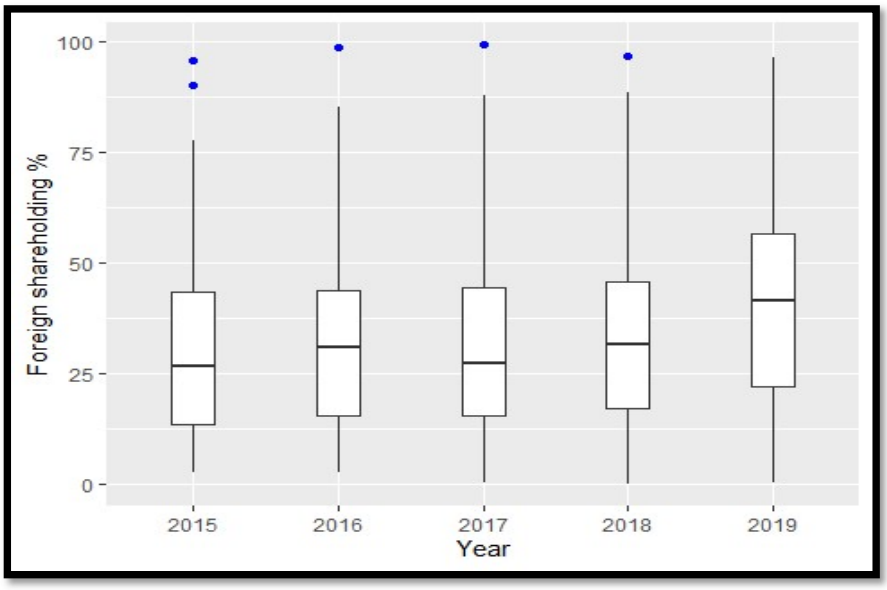

Figure 1: Distribution of foreign shareholding percentage

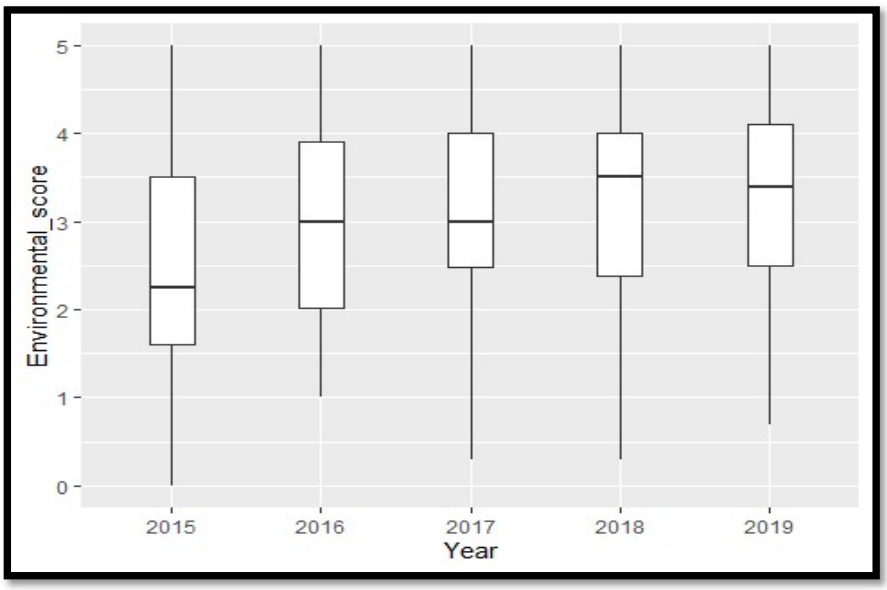

Figure 2: Distribution of environmental score

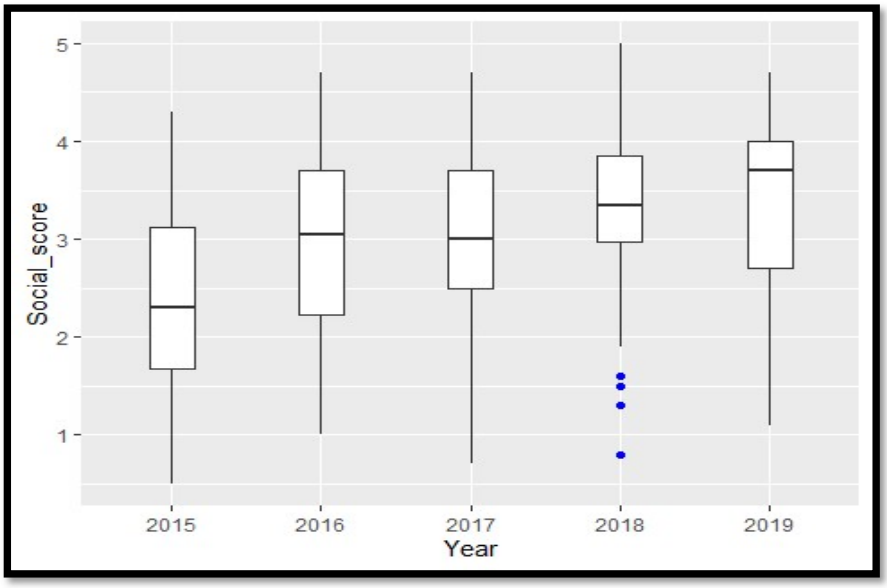

Figure 3: Distribution of social score

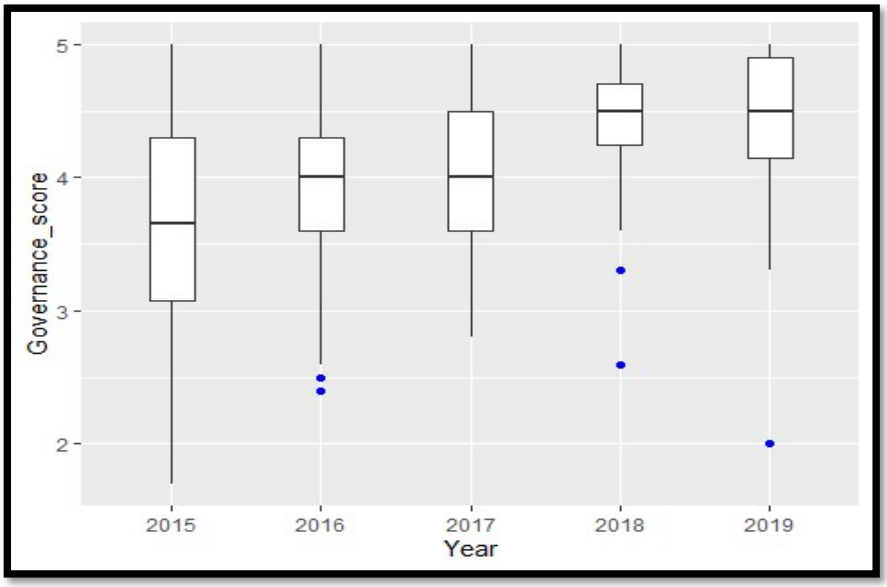

Figure 4: Distribution of governance score

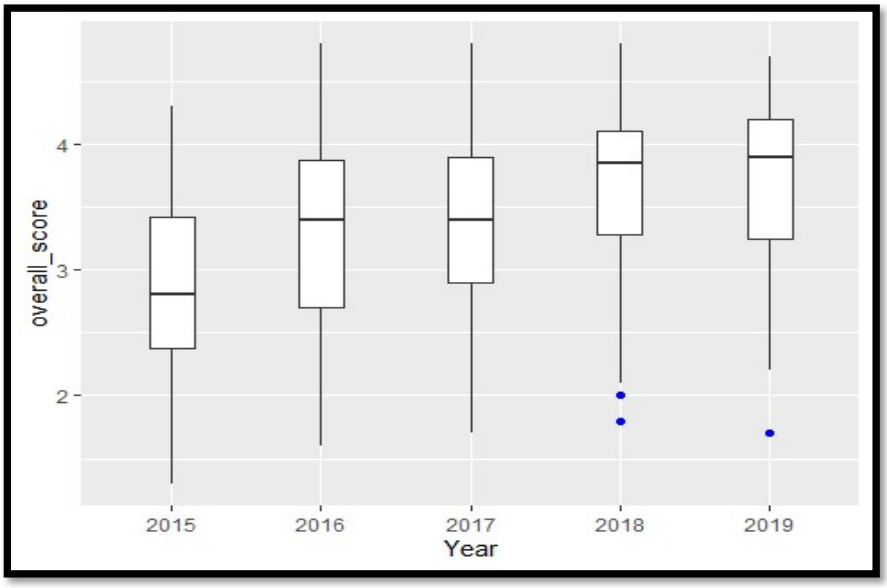

Figure 5: Distribution of overall ESG score

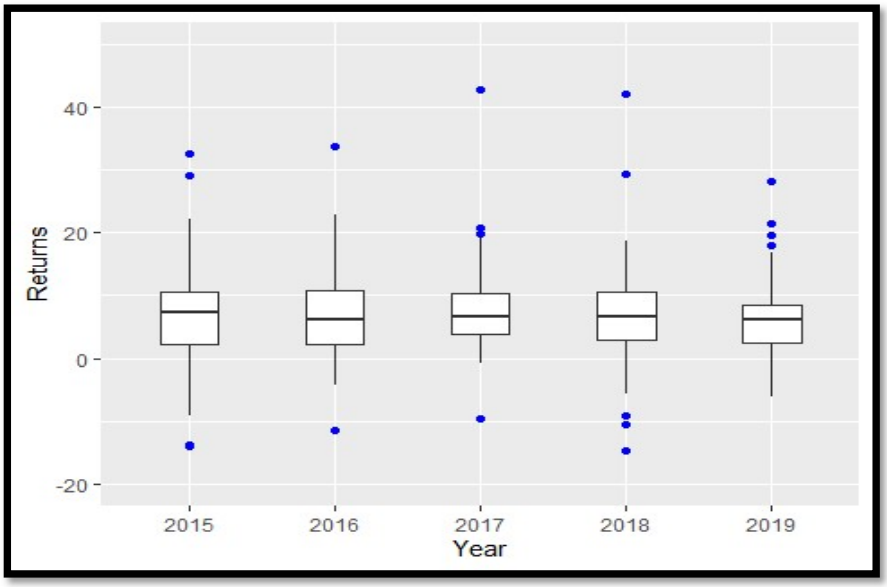

Figure 6: Distribution of return on assets

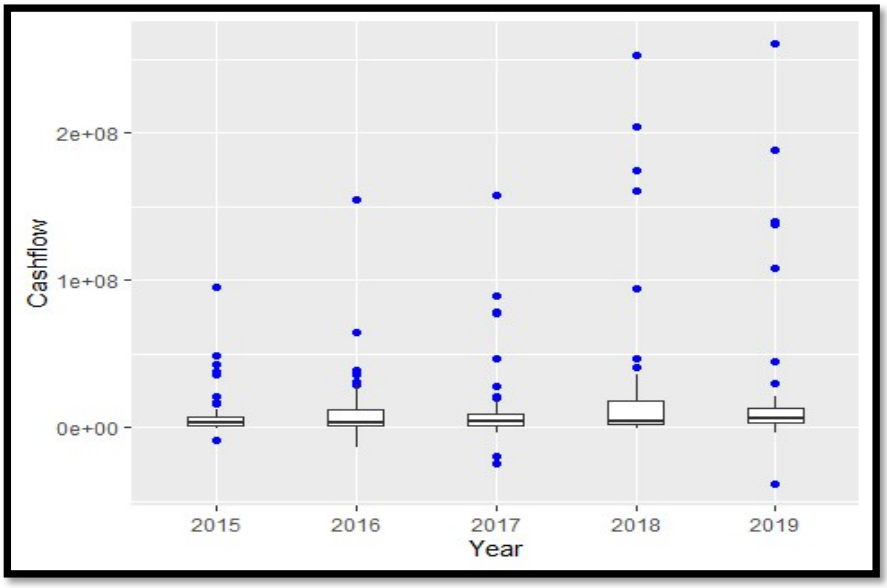

Figure 7: Distribution of free cash flows

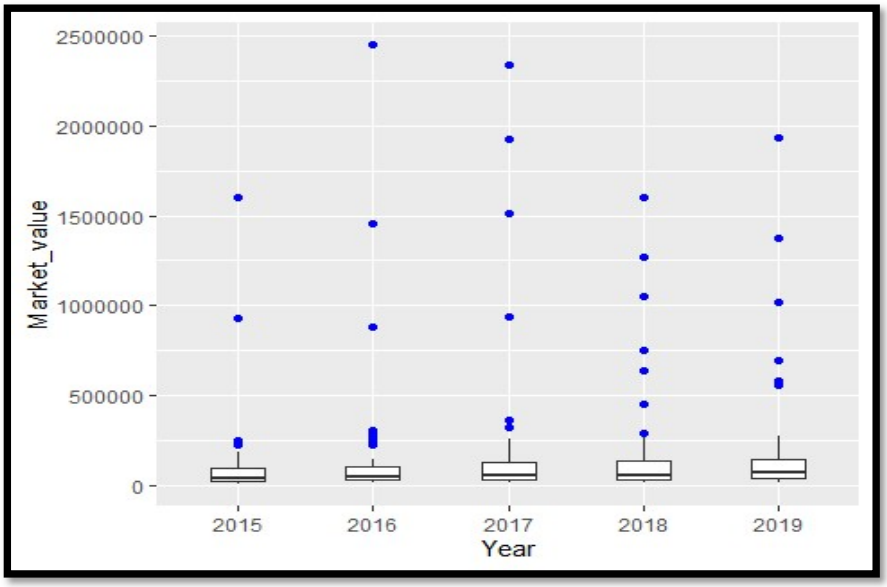

Figure 8: Distribution of market value

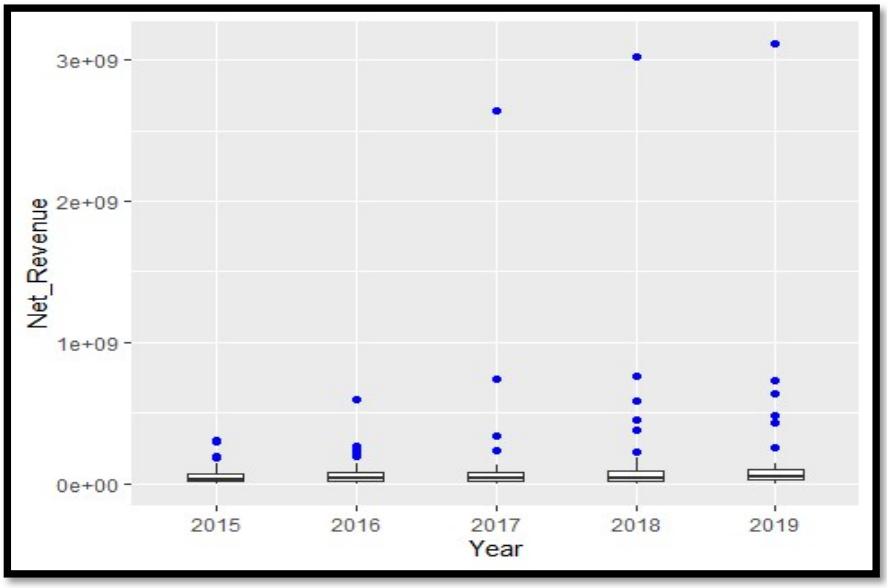

Figure 9: Distribution of net revenue

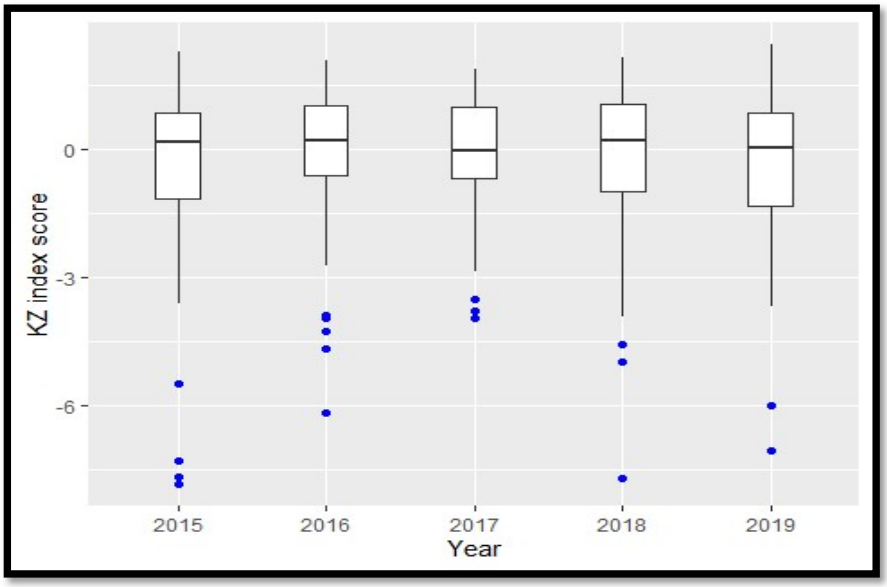

Figure 10: Distribution of the KZ index scores

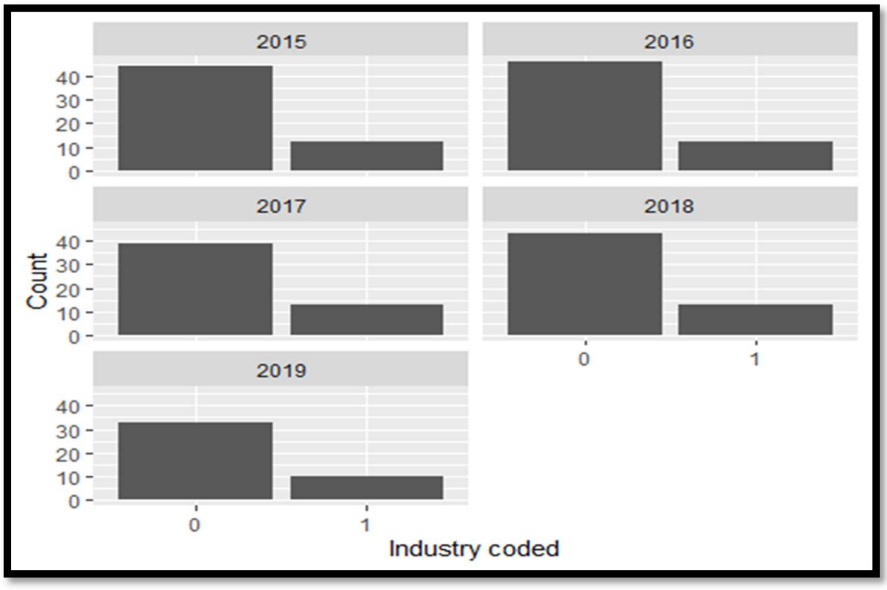

Figure 11: Distribution of the sensitive against non-sensitive industries

APPENDIX 4

To further analyse the theme level scores across the three pillars (environmental, social and governance), the median and mean score for each year under review was determined:

Median Scores per Theme over the five years

Pillar	Theme Category	2015	2016	2017	2018	2019
Environmental	Biodiversity	3.0	3.0	4.0	4.0	5.0
	Climate Change	3.0	4.0	4.0	4.0	4.0
	Environment Supply Chain	1.0	2.0	2.0	3.0	3.0
	Pollution and Resources	2.0	2.5	3.0	3.0	3.0
	Water use	3.0	3.0	4.0	4.0	2.0
Social	Customer Responsibility	-	2.0	3.0	3.0	4.0
	Health and Safety	3.0	3.0	3.0	3.0	3.0
	Human Rights and Community	3.0	3.0	3.0	4.0	4.0
	Labour Standards	3.0	3.0	3.0	4.0	4.0
	Social Supply Chain	2.0	3.0	3.0	3.0	3.5
Governance	Anti Corruption	3.0	3.0	3.0	4.0	4.0
	Corporate Governance	5.0	5.0	5.0	5.0	5.0
	Risk Management	3.0	4.0	3.5	4.0	4.0
	Tax transparency	1.0	3.0	3.0	5.0	4.0

Mean Scores per Theme over the five years

Pillar	Theme Category	2015	2016	2017	2018	2019
Environmental	Biodiversity	2.2	3.2	3.3	4.0	4.2
	Climate Change	3.1	3.5	3.7	4.1	3.9
	Environment Supply Chain	1.3	1.8	2.1	2.5	2.9
	Pollution and Resources	2.2	2.7	2.7	2.6	2.7
	Water use	3.3	3.4	3.6	3.2	2.4
Social	Customer Responsibility	1.0	2.1	2.8	3.1	3.6
	Health and Safety	3.2	3.3	3.3	3.1	3.0
	Human Rights and Community	3.2	3.3	3.5	3.8	3.9
	Labour Standards	2.5	3.0	3.2	3.5	3.6
	Social Supply Chain	1.6	2.4	2.3	2.8	2.9
Governance	Anti Corruption	2.9	3.4	3.5	4.4	4.1
	Corporate Governance	4.8	4.9	4.9	4.9	5.0
	Risk Management	3.1	3.6	3.6	4.0	4.1
	Tax transparency	1.6	2.6	3.0	3.8	3.7

APPENDIX 5

The models below illustrate the results of the generalised linear mixed models performed in this study. Results for the following analyses have been included:

- Overall Score results;
- Combination of the three pillar score results;
- Environmental score results;
- Social score results;
- Governance score results; and
- Combination of overall score results and identified control variables

Model 1: Overall Score Results

```
Family:          beta                    (          logit          )
Formula:          Shareholding ~ overall_score + (1 | ISIN) + (1 | Ye
ar)
Data:                                                      Kate_data

      AIC                   BIC          logLik   deviance   df.resid
   -213.4        -195.5           111.7        -223.4               260

Random                                                      effects:

Conditional                                                   model:
Groups    Name                                 Variance    Std.Dev.
ISIN                        (Intercept)        0.758489        0.87091
Year                        (Intercept)        0.003759        0.06131
Number    of    obs:    265,    groups:       ISIN,    78;    Year,    5

Dispersion     parameter     for     beta     family     ():     8.52

Conditional                                                   model:
              Estimate     Std.     Error     z     value     Pr(>|z|)
 (Intercept)       -1.59746         0.33040     -4.835   1.33e-06   ***
overall_score     0.22438          0.09425       2.381       0.0173   *

Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Model 2: Individual ESG scores assessed in combination

```
1. Family:         beta                  (         logit         )
    Formula:
    Shareholding ~ Environmental_score + Social_score + Governance
   _score                                                          +
        (1       |       ISIN)       +       (1       |       Year)
    Data:                                                 Kate_data

         AIC                BIC        logLik   deviance   df.resid
      -213.0       -188.0         113.5       -227.0             258

    Random                                                  effects:

    Conditional                                               model:
     Groups    Name                            Variance    Std.Dev.
     ISIN                  (Intercept)       0.718580       0.84769
     Year                  (Intercept)       0.004322       0.06574
    Number   of   obs:   265,   groups:      ISIN,   78;   Year,   5

    Dispersion    parameter    for    beta    family    ():    8.53

    Conditional                                               model:
                        Estimate   Std.   Error   z   value   Pr(>|z|)
    (Intercept)           -1.24018     0.39186   -3.165   0.00155 **
    Environmental_score    0.12702      0.07910     1.606    0.10829
    Social_score             0.13468      0.10504     1.282    0.19978
    Governance_score       -0.09304      0.10686    -0.871    0.38392

    Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Model 3: Environmental Score Results

```
##              Family:       beta              (       logit       )
## Formula:          Shareholding ~ Environmental_score + (1 | ISIN)
+                    (1                    |                    Year)
##                           Data:                           Kate_data
##
##              AIC              BIC       logLik   deviance   df.resid
##       -215.3       -197.4          112.6       -225.3             260
##
##                           Random                           effects:
##
##                         Conditional                          model:
##       Groups    Name                            Variance    Std.Dev.
##           ISIN                (Intercept)      0.741093     0.86087
##           Year                (Intercept)      0.004495     0.06704
##   Number   of   obs:   265,   groups:      ISIN,   78;   Year,   5
##
##    Dispersion    parameter    for    beta    family    ():    8.54
##
##                         Conditional                          model:
##                             Estimate  Std.  Error  z  value  Pr(>|z|)
## (Intercept)              -1.3663       0.2154   -6.345  2.23e-10  ***
## Environmental_score     0.1758        0.0631     2.786   0.00534  **
##                                                                    ---
## Signif. Codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ‘ 1
```

Model 4: Social Score Results

```
Family:          beta                      (          logit          )
Formula:          Shareholding ~ Social_score + (1 | ISIN) + (1 | Yea
r)
Data:                                                      Kate_data

       AIC                   BIC          logLik   deviance   df.resid
     -213.7       -195.8          111.8       -223.7              260

Random                                                      effects:

Conditional                                                   model:
  Groups    Name                                 Variance    Std.Dev.
  ISIN                     (Intercept)        0.746043       0.86374
  Year                     (Intercept)        0.002468       0.04967
  Number    of    obs:    265,    groups:       ISIN,    78;    Year,    5

 Dispersion     parameter     for     beta     family     ():     8.47

 Conditional                                                  model:
              Estimate     Std.     Error     z     value     Pr(>|z|)
 (Intercept)     -1.39732          0.24588     -5.683   1.32e-08   ***
 Social_score     0.18395          0.07474       2.461       0.0138   *

Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Model 5: Governance Score Results

```
Family:          beta                        (          logit          )
 Formula:          Shareholding ~ Governance_score + (1 | ISIN) + (1
|                                                                  Year)
 Data:                                                          Kate_data

      AIC                   BIC          logLik   deviance   df.resid
   -207.9        -190.0           108.9        -217.9               260

 Random                                                          effects:

 Conditional                                                       model:
  Groups    Name                                  Variance    Std.Dev.
  ISIN                      (Intercept)        0.812456       0.90136
  Year                      (Intercept)        0.002113       0.04597
 Number    of    obs:    265,    groups:       ISIN,    78;    Year,    5

 Dispersion     parameter     for     beta     family     ():     8.44

 Conditional                                                       model:
                  Estimate    Std.    Error    z    value    Pr(>|z|)
 (Intercept)          -1.08669       0.39305    -2.765     0.0057  **
 Governance_score     0.05511         0.09198       0.599       0.5491

 Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Model 6: Combination of Overall Score and Control Variables results

```
  Family:          beta                    (          logit          )
 Formula:
 Shareholding  ~  overall_score  +  log(Returns)  +  log(Cashflow)  +
     log(Market_value) + log(Net_Revenue) + log(KZ_score) + Ind_coded
+
     (1        |        ISIN)        +        (1        |        Year)
 Data:                                                      Kate_data

      AIC                    BIC          logLik    deviance    df.resid
    -72.6         -43.0           47.3         -94.6                98

 Random                                                      effects:

 Conditional                                                   model:
  Groups    Name                              Variance        Std.Dev.
  ISIN                    (Intercept)       3.700e-01       6.083e-01
  Year                    (Intercept)       5.333e-10       2.309e-05
 Number    of    obs:    109,    groups:       ISIN,    44;    Year,    5

 Dispersion     parameter     for     beta     family     ():     7.16

 Conditional                                                   model:
                   Estimate    Std.    Error    z    value    Pr(>|z|)
 (Intercept)           -6.95530       1.69535    -4.103  4.09e-05  ***
 overall_score           0.03836        0.14906      0.257      0.7969
 log(Returns)           -0.04174        0.13774     -0.303      0.7618
 log(Cashflow)           0.05134        0.15160      0.339      0.7349
 log(Market_value)    0.30620        0.13965      2.193      0.0283  *
 log(Net_Revenue)      0.10627        0.16717      0.636      0.5250
 log(KZ_score)           0.03026        0.12255      0.247      0.8050
 Ind_coded1              -0.20556        0.32636     -0.630      0.5288

 Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```