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The Impact of ESG on the Financial Performance of Johannesburg Stock Exchange-Listed Companies

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Abstract: The relationship between ESG and firm performance is complex and tends to yield mixed results globally. In South Africa, ESG implementation is still in its infancy stage due to economic and developmental challenges. Despite these challenges, the JSE introduced sustainability disclosure guidelines in 2022 to enhance ESG adoption in South Africa. Thus, the study seeks to understand the impact of ESG and firm size on the financial performance of JSE-listed firms in South Africa. The study utilised the JSE Top 40 firms for the period from 2002 to 2022. Furthermore, the study employed a two-step System Generalised Method of Moments, to estimate the impact of total ESG and individual dimensions of ESG on firm financial performance. Additionally, the study examined the moderating effects of firm size on the relationship between financial performance and ESG. The results revealed a positive and significant relationship between total ESG and firm financial performance. However, the findings regarding individual ESG dimensions and firm performance are mixed. Firm size has a moderating effect on the relationship between ESG and firm financial performance. The implication of these findings for South Africa is increased foreign direct investment from green investors and listed firms seriously considering ESG in their operations.

Keywords: ESG; firm performance; South Africa; sustainability; JSE; system GMM

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1. Introduction

Environment, Social and Governance (ESG) was first introduced in South Africa through the King's Report in 1994, which served as a guide for ethical and effective leadership among South African listed companies. In 2004, the Johannesburg Stock Exchange (JSE) launched a Socially Responsible Investing (SRI) index to reinforce governance and socially conscious themes such as the environment, society, and ethics. Over the years, investor interest in ESG has grown both globally and locally. In 2022, the JSE introduced sustainability disclosure guidelines to assist JSE-listed companies in navigating the ESG landscape, highlighting the country-specific sustainability challenges that need to be considered in their ESG reports. Despite these initiatives, South Africa faces post-colonial developmental challenges and the resource curse, failing to benefit from its abundant natural resources (Atsu and Adams 2021).

In addition to developmental challenges in South Africa, the relationship between ESG and firm performance has remained largely inconclusive, with research still unsure of the reasons behind this phenomenon (Chen and Xie 2022; Pastor et al. 2022). Institutional investors in South Africa are shifting towards sustainable and ethical investments due to pressure from Code for Responsible Investment in South Africa (CRISA) and Regulation 28

(National Treasury 2021). A few studies have been conducted on the relationship between ESG and firm performance in South Africa, and these studies have yielded mixed results (Chen and Xie 2022; Lee and Suh 2022; Dobrick et al. 2023; Lee et al. 2023). This study seeks to investigate the effects of ESG and firm size on firm performance and to establish whether the relationship encourages firms to adopt and implement ESG practices. This study uniquely uses market performance indicators, namely market value and earnings per share to gauge investor sentiments towards ESG as opposed to firm performance indicators. In addition, the study analyses the moderating effects of firm size on ESG performance of JSE-listed firms. The study is conducted on JSE's top 40 listed firms for the period from 2002 to 2022 using two step system GMM. The subsequent sections of this study include the Literature Review, Methodology, Findings, and Conclusions.

2. Literature Review

2.1. Theoretical Frameworks

2.1.1. Legitimacy Theory

Legitimacy theory was developed in 1975 by Dowling and Pfeffer (1975). The theory states that there is a social contract that exists between society and the firm and that contract determines the behaviour of the firm towards various stakeholders in society (Deegan 2002). A firm has the right to operate if its values align and are approved by the society in which it operates (Shehata 2014). As such firms become part of the broader social system to earn the right to resources. Thus, legitimacy is affected by time and place (Deegan 2019). According to this theory, if the social values of the company align with those of the society in which it operates, organisational legitimacy exists, while a gap between the two systems is a threat to organisational legitimacy and such a company can be penalised by society (Deegan 2019; Dowling and Pfeffer 1975). Thus, according to Deegan (2019), when an organisation's operations are not aligned with social contracts, the company is forced to take remedial action in pursuit of legitimacy.

Sustainability reporting is mostly voluntary; thus, it is important to understand the motive for disclosure, as it influences the reliability of the information provided to various stakeholders (Dinh et al. 2023; Tsang et al. 2023). Deegan (2002) identified legitimacy as the major motivation behind ESG disclosure. However, there is a lack of evidence on whether legitimising disclosure impacts society's perception of a company or which stakeholders influence legitimising disclosure. Nonetheless, this theory can explain non-financial information disclosure by management (Deegan 2019; Maama and Appiah 2019; Burlea and Popa 2013). If a firm is successful in legitimising its operations and disclosures, it may result in reduced pressure from stakeholders to introduce regulation (Deegan 2019). Legitimacy theory can be used to promote accountability and encourage disclosure by firms (Patten 2019). Annual financial reports are considered integral legitimacy documents for any listed company, and they should thus include regulatory and voluntary information (Shehata 2014).

2.1.2. Signalling Theory

The signalling theory is concerned with the information asymmetry that exists between a signaller and the receiver (Spence 1978). A dishonest individual can send a misleading signal aimed at benefiting oneself. This poses the risk of undermining the entire population's signalling system (Kharouf et al. 2020). The theory addresses the fundamental communication challenge of transparency in events in which the signaller has an interest but needs to convince the signal receiver of their honesty (Yasar et al. 2020). This challenge is exacerbated by the conflict of interest between the signaller and the receiver. In most cases, the signaller has the upper hand as they have insider information (Gambetta 2008).

Signals can be intentional or unintentional messages that are sent to be decoded by the receiver to eliminate information asymmetry (Kharouf et al. 2020; Riley 1979). An effective signal should be fairly priced and credible, and above all, it should reflect the signaller and their capabilities (Kharouf et al. 2020). It can be new or additional information, different from that previously held by the receiver (Yasar et al. 2020).

The signalling theory has been used to justify voluntary ESG disclosure in financial reporting (Abeysekera 2022; Shehata 2014; Ross 1977). Companies disclose over and above the legal and regulatory standards to signal to the market that they are superior to their competitors. Furthermore, ESG reporting significantly reduces information asymmetry between the firm and shareholders (Huang 2021). Pioneering ESG reporting firms aimed to show the firm's commitment to sustainability and ethical practices to various stakeholders. A firm has no control over how the various business stakeholders interpret these report signals (Huang 2021). Despite this, signalling theory remains a cornerstone in the ESG and financial performance matrix, with sustainability-conscious firms enjoying a lower cost of capital as they are considered less risky by investors and financiers (Saini et al. 2023). Thus, firms invest a considerable chunk of resources towards the disclosure of favourable ESG activities that investors cannot find anywhere else (Pulino et al. 2022). In addition, firms try to reduce information asymmetry by disclosing their long-term ESG targets and initiatives. By disclosing long-term sustainability plans, the firms will equally be signalling to the market and various stakeholders the firm's commitment to environmental, social, and governance issues (Pulino et al. 2022). Signalling theory further suggests that stakeholders can punish firms that are not sustainable and disregard ESG implementation by boycotting the firm's products and stocks.

Legitimacy theory and signalling theory are interconnected frameworks that help explain ESG disclosure and accountability practices by firms. Legitimacy theory posits that organisations must align their actions with societal expectations to maintain their social contract to operate (Deegan 2002), while signalling theory emphasises the need to inform the various stakeholders to ensure the long-term success of a firm (Freeman 1999). In addition, signalling theory complements the legitimacy theory by suggesting that firms disclose information to reduce information asymmetry and signal credibility to both society (legitimacy) and stakeholders (Spence 1978). Together, these two theories provide a holistic understanding of why companies engage in voluntary ESG reporting, balancing societal expectations, stakeholder demands, and strategic communication to enhance transparency and trust (Deegan 2002).

2.2. Institutional Landscape

Responsible investment started in the 1970s with the formulation of the Sullivan Principles, which was an anti-Apartheid movement that encouraged divestment from South Africa by companies. Companies that failed to comply with the principles were blacklisted by institutional investors. This was a form of investor activism (Viviers and Els 2017). In 2003, South Africa introduced the B-BBEE Act aimed at black empowerment and improving marginalised black people's social status through supplier development, enterprise, skills development, and resource ownership (Viviers and Els 2017). The B-BBEE Act was followed up with the Financial Sector Charter (FSC) in 2004, aimed at social and economic integration and enabling access to the financial sector by all demographics in South Africa equitably. In 2006, the Johannesburg Stock Exchange (JSE) launched the South Africa Social Investment Exchange, aimed at matching donor funds with development projects with high returns. This was the second of its kind in the world. It was an online trading platform that assisted in sustainable development projects in the country. In 2008, a

South African Network for Impact Investing was birthed, which was a dialogue platform for sustainable investment on the continent (Viviers and Els 2017).

The increased demand for ESG firm performance in South Africa has forced listed companies to embrace and implement the JSE Socially Responsible Investment Index (SRI) guidelines (Maubane et al. 2014). The JSE SRI index was launched in 2004, being guided by both the GRI and the King II report. The SRI index aimed to identify firms that applied the triple bottom line principles and good corporate governance in their operations. The sustainability index enabled socially responsible investors to channel their resources to sustainable companies and offered sustainable reporting guidelines to listed South African companies. The SRI index provides investors with sustainability ratings of firms annually and contributes to sustainable business practices in South Africa.

Regulation 28 was amended in 2011 and this amendment forced pension funds to include trustee education, the B-BBEE Act, and ESG in their investment decisions. The amended Regulation 28 enabled pension funds to invest in alternative investments such as private equity and hedge funds, thus making it easier to channel funds towards ESG projects (Viviers and Els 2017). With the new Regulation 28, pension fund trustees were expected to craft investment policy statements that include B-BBEE, ESG, and trustee education (Viviers 2014). In 2019, a follow-up guidance to Regulation 28 was issued, which required all boards of trustees to consider ESG factors before investing in any asset. This additional guidance was aimed at ensuring investors' compliance with Regulation 28 (National Treasury 2021). Regulation 28 requirements have forced institutional investors to demand improved integrated reports with detailed ESG reports from companies to assist in their decision-making.

In 1994, South Africa produced its first King Report, which was strongly influenced by the Cadbury Report from the UK. This report encouraged firms to disclose a balanced view of the company. Despite this report being principle-based and not regulatory, the JSE adopted the report to become part of its listing requirements on a comply or explain basis in 1995. King II report was introduced in 2002 with a full chapter on sustainability. Sustainability, being a company's ability to integrate the triple bottom line principles and sustainability was mirrored in the African concept of ubuntu. The report encouraged full disclosure of non-financial information. The King II report was further institutionalised in 2004 when the JSE introduced the SRI index, where all listed companies included in the FTSE/JSE share index were included in the SRI index. This index was the first of its kind by an emerging economy and stock exchange. In 2007, to ensure transparency in listed company ESG evaluations, the JSE partnered with the UK firm Ethical Investment Research Services (EIRIS) (Giamporcaro and Viviers 2014). South Africa introduced the King III report in 2009, which aligned with international standards and took cognisance of the complex nature of South African sustainability reporting. The King III report highlighted the importance of ESG reporting in corporate governance as well as overall firm health. King III revealed the importance of sustainability in the 21st century as shown by the natural environment, social, and political systems. Thus, King III encouraged integrated reporting as a solution to the global financial crisis of 2008. The King IV report was introduced in 2016 with an emphasis on value creation in a sustainable context. King IV further encouraged institutional investors to practice responsible investment, and was further adopted as a listing requirement by the JSE on an apply and explain basis. Integrated reporting was further emphasised in the King IV report.

In 2010, the Johannesburg Stock Exchange recommended Integrated Reporting as part of its listing requirements and thus forced firms to incorporate and report on ESG (Andrew 2020). The mandatory Integrated reports improved the quality of ESG information disclosed by firms, which translated to improved earnings forecasts by analysts (Arif et al. 2022).

Integrated reporting in South Africa focuses on the broader stakeholder. The Integrated Reporting Committee of South Africa (IRCSA) was established in 2010 to provide guidelines on integrated reporting in South Africa. This development established South Africa as a leader in integrated reporting. In the same vein, the Institute of Directors South Africa (IoDSA) introduced the Code for Responsible Investment (CRISA) in 2011, and South Africa was the second country after the United Kingdom to formally mandate ESG consideration for investors in investment-making decisions. This code was introduced on an apply-and-explain basis. CRISA was developed from the United Nations Principles of Responsible Investment (PRI), which had been established in 2006, where South African institutional investors are members and signatories (Andrew 2020).

In efforts to combat the negative ecological footprint, the South African government introduced the Carbon Tax Act (No. 15 of 2019). Under the Carbon Tax Act, large carbon emitters are required to report their greenhouse gas emissions and pay tax, which is a function of sector and rebates. The government further issued regulations aimed at offsetting carbon emissions by taxpayers in November 2019, intended to encourage climate-positive ventures and drive financial institutions to orderly transition from high to low carbon investment financing (Worthington-Smith and Giamporcaro 2022).

2.3. Firm Performance and ESG

A bidirectional relationship exists between ESG performance, financial performance, and risk. This implies that sensitive and profitable firms tend to invest in ESG activities to yield superior returns in the future (Khan 2022; Naeem et al. 2022). Sensitive industries, such as mining and oil, tend to disclose more ESG information to legitimise and send signals to the market, and to defend their reputation (Khan 2022). ESG disclosure positively affects firm performance even after moderating effects on competitive advantage in Malaysia. A unit increase in ESG disclosure translated into a 4% increase in firm performance. Furthermore, firms with high ESG disclosure ratings have a greater competitive advantage than their counterparts (Mohammad and Wasiuzzaman 2021). In China, ESG ratings have significantly increased the quantity and quality of green innovations (Tan and Zhu 2022). IT companies were the lowest in terms of ESG rating; however, they had the potential to develop their own ESG practices since ESG affects performance. Interestingly, Egorova et al. (2022) advocated for market value as the best measure to test ESG factors when analysing the relationship between ESG and firm performance.

A study of Italian top 100 firms revealed that ESG disclosure had a positive impact on Earnings Before Interest and Tax (EBIT), and this was attributed to the EU Directive 2014/95 which was later adopted in Italy under Legislative Decree 254/2016 becoming effective in 2017 (Pulino et al. 2022). Despite the positive link between ESG and EBIT, return on revenue remained lower than the rise in capital investment in the short term. Environmental and social initiatives had a positive effect on EBIT, and this was credited to customers rewarding the firm's environmental and social activities through increased sales. However, there was no relationship between corporate governance and EBIT in Italy. On the contrary, in South Korea, corporate governance for chaebol firms had a positive effect on firm value. The positive influence of corporate governance in chaebol firms was attributed to size and government-led company structure reforms in these family-run firms (Yoon et al. 2018). In the same study, Pulino et al. (2022) observed a negative relationship between environment and return on assets (ROA). This negative relationship was attributed to an increase in low-carbon emission investments, which yielded a low return on investment in the short run. Environmentally sensitive firms had a negative relationship with environmental score (Yoon et al. 2018). These findings revealed that large firms with huge debt tend to invest

more in ESG activities to meet ESG disclosure conditions of their debt obligations (Ahmad et al. 2021; Khan 2022).

A study of 57 non-financial companies that are part of the S&P 500 revealed a positive relationship between ESG and firm financial performance using a two-stage least squares estimation method. There was a significant relationship between ESG and Tobin's Q, which implied that investors viewed ESG activities by firms positively and hence improved market value. There was also a positive relationship between ESG and accounting performance indicators: return on assets (ROA) and return on equity (ROE), though to a lesser magnitude than Tobin's Q in the long run (Nguyen et al. 2022). Similarly, Alareeni and Hamdan (2020); and Rahman et al. (2023) observed a positive connection between ESG disclosure and monetary performance. Nevertheless, environmental and corporate social responsibility activities had a negative association with return on assets and return on equity. Environmental and corporate social responsibility had a positive relationship with Tobin's Q. Tobin's Q and ROA were positively correlated with governance, whereas ROE was negatively correlated with governance. These findings are in contrast to Shaikh (2022), who observed an adverse relationship between ESG and firm performance. This negative relationship stemmed from increased capital expenditure during the preliminary years of ESG implementation, which in turn affected ROA and ROE. ESG investment in the formative adoption stages gradually diminished the firm's financial performance until it became negative.

Similarly, Alareeni and Hamdan (2020) and Aydoğmuş et al. (2022) found an overall positive relationship between ESG and firm financial performance. However, Alareeni and Hamdan (2020) and Chen et al. (2022) observed that environment and CSR disclosures had a negative relationship with ROA and ROE. Furthermore, environmental and CSR disclosure had a positive effect on Tobin's Q. Corporate governance hurt ROE and was positively related to Tobin's Q and operational performance (ROA). Large firms with massive assets and leverage tend to have high total ESG, individual environmental, social, and governance scores. These high scores translated to high operational (ROA) and financial performance (ROE) (Alareeni and Hamdan 2020). Aydoğmuş et al. (2022), in contrast, found social and corporate governance activities to have positive and significant effects on firm performance, while the environmental score had an insignificant relationship with firm performance. The lack of relationship between the environmental pillar and firm performance was attributed to the long turnover period before environmental investments could yield returns. The overall positive relationship between ESG and firm performance supports stakeholder theory, which shows that companies' investments in ESG activities are rewarded by the government, investors, shareholders, and other stakeholders. These inconclusive results on individual ESG components and financial performance align with Ahmad et al. (2021), who found a positive correlation between ESG and firm performance and mixed results between financial performance and individual ESG elements.

European countries have significantly adopted the GRI ESG disclosure guideline and established sustainability committees aimed at addressing ESG issues. Asian countries are more sustainability-disciplined in the energy sectors, and Asian Pacific countries are more inclined towards technology firms (Shaikh 2022). Pressure and demands from investors and other stakeholders have led to ESG investment in the US, and interestingly, management with an unvested interest in companies tends to over-invest in ESG and negatively affect firm value (Nguyen et al. 2022). In light of this, Nguyen et al. (2022) concluded that firms that desire to improve firm value should invest in ESG activities and publicly disclose ESG activities to strengthen investors' and other stakeholders' commitment to the firm. In the same vein, Yoon et al. (2018) resolved that ESG significantly improved the market

value of Korean firms. Climate change reporting and disclosure significantly improve firm performance among private manufacturing firms (Chen et al. 2022).

On a different note, a study consisting of Malaysia, Indonesia, Thailand, and Singapore found no relationship between ESG scores and both market and firm performance indicators. An increase or decrease in a firm's sustainability investments had no profound effect on firm performance. This result reflected the non-inclusion of sustainability indicators and ESG research in firm performance measurement within these ASEAN countries (Junius et al. 2020). However, in light of this, Singapore, due to its mandatory ESG disclosure regulations, had a significant positive relationship between ESG and firm performance (Junius et al. 2020). Narula et al. (2024) revealed that there was no significant relationship between ESG and firm performance despite India being the fifth largest growing economy in the world. These indifferent findings can be attributed to the cost burden of ESG disclosure, which reduces profitability. In China, the relationship between ESG and firm performance is U-shaped, implying that there is a positive relationship between ESG and firm performance up to a certain point, and any additional ESG activities beyond the threshold will yield negative firm performance (Pu 2023).

Improved board diversity, transparency, and governance structure improved companies' operational and market performances. Environmental and social activities had an adverse effect on both market and operational performances. However, firms implementing sustainability measures were obtaining more attention from stakeholders, which implied improved market and operational performances in the long run. In the same vein, ESG research and development significantly improved Tobin's Q (Shaikh 2022).

Firm size had a moderating effect on the relationship between ESG and market performance (Ahmad et al. 2021; Pastor et al. 2022). Small-capital stocks are slow to react to climate change shocks in the news (Pastor et al. 2022). The ESG pillar positively influenced firm performance for FTSE350-listed firms, and high ESG firms outperformed low ESG firms. Transparent ESG information reduces information asymmetry between the firm and investors, and firms can predict the intrinsic value of shares. Large firms tend to invest in ESG due to economies of scale and to meet the ESG demands of various stakeholders. Similarly, firms with significant debt and assets tend to perform better in terms of ESG score, E score, S score, and G score (Ahmad et al. 2021). Firms with huge media attention can eliminate stakeholder ESG investment information asymmetry by taking advantage of the media (Bissoondoyal-Bheenick et al. 2023). Negative ESG news hurts firm performance. Firm reputation has a signalling effect on investors; however, on the contrary, firms in the sin industries were not affected by negative publicity (Wong and Zhang 2022). Firm characteristics, industry and reputation influenced how investors reacted to negative media coverage.

In the same light, Bissoondoyal-Bheenick et al. (2023) and Rahman et al. (2023) found a positive relationship between ESG and Tobin's Q, which was highly driven by the social pillar, and this positive social pillar outweighed the positive Environmental and Governance pillars among the G-20 nations. These findings reveal that the Environmental and Governance pillars affect a firm's internal operations, while the social pillar, on the contrary, affects the external aspects of the firm. The social scope includes business risk, which affects business reputation. A firm is a subset of society, and firm value is derived from meeting society's expectations (Bissoondoyal-Bheenick et al. 2023). A firm's reputation is dependent on the social pillar, and the social pillar has grown progressively over the years to include human rights, health and safety, product safety, labour issues, and quality. Consequently, the social pillar measures the company culture and the firm's shared values with society. In a similar vein, corporate scandals are a function of the disintegration of the social pillar. These findings are in congruence with the stakeholder and legitimacy theory.

The same study by Bissoondoyal-Bheenick et al. (2023) using excess returns as a measure of performance, found conflicting results from those found using Tobin's Q. There was an adverse relationship between ESG and excess returns. The negative relationship was driven by the governance pillar, which outweighed the environmental and social pillars. To illustrate, a unit decrease in governance score led to a 15.1% decline in annual returns. This result displayed investors' sensitivity to corporate governance information, and this susceptibility emanates from corporate governance scandals that have rocked the G20 nations since 2000. In contrast, Shakil et al. (2019) observed that corporate governance did not affect financial performance in emerging markets; yet, the environmental and social aspects of ESG had a positive effect on firm performance in emerging markets. In sectoral analysis, the environmental score had a significant effect in the mining sector, and the three ESG pillars were significant in the retail sector using Tobin's Q. However, only the transport sector had a significant financial performance for all three ESG pillars using excess returns. These findings were in line with Yoon et al. (2018) who positioned that firm and industry characteristics significantly influenced the effect of ESG on share prices. Environmentally sensitive firms had a lower relationship between ESG and firm value.

In a study that utilised ESG data relevant to financial materiality and the United Nations Global Compact (GC) score to measure reputation from adherence to the UNGC. Yoo et al. (2021) observed that an increase in ESG score, especially the environmental pillar, led to increased stock price returns and lower stock price volatility. Conversely, corporate governance led to lower returns and increased volatility (Bissoondoyal-Bheenick et al. 2023). Non-energy sectors benefited extensively from the improved environmental pillar compared to companies in the energy sector. However, companies in the energy sector benefited from reduced stock price volatility due to improved environmental performance during crisis periods (Yoo et al. 2021). Firms in the lower ESG band benefited more from ESG implementation than firms in the high ESG band (Ahmad et al. 2021; Yoo et al. 2021). These findings revealed that ESG investments during financial crisis periods reduced stock volatility and the probability of a stock price crash (Feng et al. 2022; Yoo et al. 2021).

Furthermore, ESG upgrades led to optimistic yet inconsistent significant abnormal returns of 0.5% per month, while ESG downgrades negatively affected stock returns by a magnitude of 1.2% per month. These findings are more pronounced in ESG-leading firms than in laggard firms (Shanaev and Ghimire 2022). ESG efficiencies were observed to be greater than traditional efficiencies in the automotive industry. Firm size, geographical location, and level of innovation significantly affected ESG efficiencies in the automotive industry. The European automakers outperformed their American and Asian counterparts (Ahmad et al. 2021; Shanaev and Ghimire 2022; Stefanoni and Voltes-Dorta 2021). Corporate governance yielded the highest efficiencies, followed by the environmental and lastly the social pillars.

ESG and Firm Performance in South Africa

Using a two-stage least squares instrumental analysis, Chininga et al. (2023) observed that improved ESG actions positively affected both return on equity and market-grounded performance gauges (Tobin's Q). Environmental initiatives significantly influenced the market and accounting performance indicators more than the social and governance initiatives for the JSE top 40 companies, and this is attributed to the majority of the top 40 companies being in the materials and mining industries. Magubane and Wesi (2023), using PNARDL, found a positive relationship between ESG investing and financial performance in the financial sector. A one percent increase in ESG investing led to a five percent increase in bank financial performance. ESG investing was crucial in influencing stock performance in the South African financial sector during the COVID-19 pandemic. During crisis periods

such as COVID-19, it is paramount for the financial sector to embark on ESG investing to improve financial resilience. On the contrary, Chininga et al. (2023) observed that the overall ESG rating negatively affected market performance, and this implies that investors in South Africa do not value a firm's ESG investing activities.

Hypothesis 1. *Individual and total ESG score has a positive effect on firm financial performance.*

Firm size and firm performance have a complex relationship. As firms mature, they benefit from economies of scale, and their public scrutiny and exposure to media coverage increase as well (Bissoondoyal-Bheenick et al. 2023; Khan 2022; Wong and Zhang 2022). Firm size is not merely a control variable but plays a significant role as a moderator in the relationship between ESG and firm financial performance (Ahmad et al. 2021). A moderating variable is unique as it amplifies the strength or direction of an effect in the relationship between a dependent variable and the independent variable. To date, only a handful of studies show the effect of firm size on ESG and financial performance separately, notably: (Ahmad et al. 2021; Graves and Waddock 1994; Ullmann 1985). Large firms have a positive effect on social performance due to pressure from various stakeholders and have the resources to meet the demands of the stakeholders (Bissoondoyal-Bheenick et al. 2023; Ullmann 1985). Further, Ahmad et al. (2023) observed that firm size and ESG had a moderating effect on the 2007–2010 global financial crisis and company performance. ESG and corporate governance are strategic tools that can be utilised by firms in times of financial crisis. In addition, Zaiane and Ellouze (2023) observed a moderating effect of firm size on environmentally sensitive firms and environmentally non-sensitive large firms engaged in symbolic CSR, unlike their counterparts. Smaller firms, by size, found CSR to be expensive to implement and hence discarded CSR despite the pressure from the industry. On the contrary, Gregory (2024) failed to find a significant relationship between firm size and ESG rating, and only outlier states positively influenced the relationship between firm size and ESG ratings. This study utilised firm size as both a moderating and control variable in analysing the relationship between ESG and market performance.

Hypothesis 2. *Firm size has a moderating effect on the firm performance of listed firms in South Africa.*

3. Methodology

3.1. Data Description and Data Sources

The research utilised the JSE-listed companies from 2002 to 2022, and a sample of JSE top 40 listed firms was used in this study. JSE Top 40 firms were selected because they are the largest counters with a combined market capitalisation that constitute 80% of the JSE stock exchange. In addition, the top 40 firms represent all the sectors on the JSE stock exchange. The study used secondary data, and this data was collected from the Bloomberg research domain. The Bloomberg database has data starting from 2002. Hence, the study period is from 2002. To reveal the impacts of ESG on the financial performance of JSE-listed companies, the study employed a dynamic panel model in the form of a system generalised method of moments (System GMM) that is more powerful and able to deal with endogeneity problems than OLS (Kwenda 2014; Nyeadi et al. 2018). A different GMM and system GMM were used to eliminate the correlation between the regressor and the error arising from the demeaning process of subtracting everyone's mean value of y and each X from the respective variable. The ordinary least squares (OLS) method's endogeneity and simultaneity bias were fixed by a differenced GMM. The approach used instrumental variables and each variable's initial difference lag levels (Arellano and Bond 1991). The bias

caused by leaving variables out of the cross-sectional data was eliminated as a result. To capture moment conditions in addition to differential form moment conditions, a system GMM was implemented because lagged level regressors may be poor instruments for the differenced variables. The system GMM model will be employed to scrutinise the impact of ESG on the financial capabilities of JSE-listed companies (Shakil et al. 2019).

Definition and Justification of Variables

Following Ahmad et al. (2021) and Chen and Xie (2022), the dependent variables for the study were market value (MV) and earnings per share (EPS). EPS reflects changes in profitability and shares since it is calculated from net profit and shares. Qiu et al. (2016) observed that earnings per share were an important determinant of stock prices. The study used stock market-based performance measures to ensure that the research captures stock market investors' perceptions, which influence share prices and market values (Ahmad et al. 2021). Market-based measures are forward-looking and can show a firm's ability to make future profits.

The independent variables were the ESG score, ENV score, SOC score, CG score, ESGH score, and firm size (Ahmad et al. 2021; Saini et al. 2022). The key variable in these models was the ESG score. The study considered environmental, social, and governance scores as equally weighted (Ahmad et al. 2021). The ESG scores measured a firm's ESG performance. The ESG score ranges from 0 to 100, where higher scores mean good performance (Ahmad et al. 2021; Chen and Xie 2022; Saini et al. 2022). Firm size is important because larger firms have more resources and benefit from economies of scale. This study used total assets as an approximation of firm size. To alleviate misleading results from omitted variables, financial performance independent variables were incorporated into the Model (Ahmad et al. 2021; Chen and Xie 2022). The financial performance variables included were total revenue, financial leverage, capex as a fraction of sales, and actual tax charges. These variables were included as control variables. Total revenue was used as a control variable due to its positive relationship with firm profitability. Financial leverage was included in the model due to its negative effect on cash flow and returns. The debt-to-assets ratio was used as a proxy for financial leverage (Ahmad et al. 2021; Saini et al. 2022). Capital expenditure is a source of long-term investment and indicates long-term growth potential (Ahmad et al. 2021; Saini et al. 2022). The effective tax rate has a direct effect on the financial performance of a company. Hence, it was included in the model. The portrayal and meaning of the variables employed are shown in Table 1 below.

Table 1. Description and definition of variables.

Variable	Expected Sign	Description
LMV		A log of a company's market value. Share price times the quantity of common shares equals market value (Ahmad et al. 2021; Saini et al. 2022).
LEPS		A log of income per share for a company. Earnings per share (EPS) is net profit divided by the total number of ordinary shares. EPS is viewed as an annualised rate, and it may reflect the previous financial year (Ahmad et al. 2021; Lee and Suh 2022).

Table 1. *Cont.*

Variable	Expected Sign	Description
LESG	+	The log of the environmental, social, and governance (ESG) scores for companies based on equal-weighted rating illustrates how a company's financial and additional monetary well-being can be similarly weighted based on the information in the IRESS's economic, environmental, social, and corporate governance pillars. According to Ahmad et al. (2021), Alareeni and Hamdan (2020), Chen and Xie (2022), and Fain (2020), it replicates a balanced view of a company's performance in these four areas.
LENV	+	Log of the environment (ENV) score. This variable shows the environmental performance of a firm and how well the company utilised environmental opportunities and avoided environmental risks that negatively impact living and non-living natural systems to generate long-term shareholder value (Ahmad et al. 2021; Saini et al. 2022).
LSOC	+	Log of social (SOC) score. This shows the ability of a company to generate loyalty and trust from customers, employees, and society at large. This variable reveals a company's reputation and its social contract to operate, which are key determinants in long-term shareholder value creation (Ahmad et al. 2021; Saini et al. 2022).
LCG	+	Log of corporate governance (CG) score. This variable quantifies a firm's systems, processes, and checks and balances aimed at ensuring the board and executives work in the best interest of long-term shareholders' value (Ahmad et al. 2021).
LTA	+	Log of total assets (total assets) score. This is a proxy for firm size and is a summation of fixed assets, current assets, and long-term receivables (Ahmad et al. 2021; Chen and Xie 2022; Saini et al. 2022)
LDA	+	A proxy for a company's financial leverage is the log of the debt-to-assets ratio (Ahmad et al. 2021; Fain 2020; Saini et al. 2022).
LREV	+	Log of revenue (REV), this variable includes gross sales and other operating revenues of a company (Ahmad et al. 2021; Fain 2020).
CAPS	-	Capital expenditure as a fraction of sales (CAPS). This variable is obtained by dividing capital spending by net sales or revenue multiplied by 100 (Ahmad et al. 2021; Saini et al. 2022).
ETR	-	Effective tax rate (ETR). This is formulated as income tax divided by profit before tax multiplied by 100 (Ahmad et al. 2021)
ESGH	+	This dummy parameter of high ESG accomplishing companies is derived from counters with ESG scores above 50% (Ahmad et al. 2021).

3.2. Model Specification

To comprehend the influence of ESG on the financial performance of JSE-listed companies, the study adopted a dynamic effects model. Linear regression models were estimated based on the following regression equations.

$$\begin{aligned} lMV_{it} = \beta_0 + \beta_1 MV_{it-1} + \beta_2 lESG_{it} + \beta_3 lenv_{it} + \beta_4 lsoc_{it} + \beta_5 lcg_{it} + \beta_6 ESGH_{it} \\ + \beta_7 ta_{it} + \beta_8 lda_{it} + \beta_9 lrev_{it} + \beta_{10} capex_{it} + \beta_{11} etr_{it} + e_{it} \end{aligned} \quad (1)$$

$$\begin{aligned} lEPS_{it} = \beta_0 + \beta_1 EPS_{it-1} + \beta_2 lESG_{it} + \beta_3 lenv_{it} + \beta_4 lsoc_{it} + \beta_5 lcg_{it} + \beta_6 ESGH_{it} \\ + \beta_7 ta_{it} + \beta_8 lda_{it} + \beta_9 lrev_{it} + \beta_{10} capex_{it} + \beta_{11} etr_{it} + e_{it} \end{aligned} \quad (2)$$

where

it represents the company I at time t.
MV and EPS are the dependent variables.
ESG, env, soc, cg, eco, and ESGH are the independent variables.
ta, da, rev, caps, and etr are the control variables.
e is the error term.

The model examines the relationship between total ESG, specific ESG factors, and high- and low-ESG-achieving corporations in terms of their financial performance as measured by market value (MV) and earnings per share (EPS) (Ahmad et al. 2021).

Moderating Effects Model

A moderating effects model was used to test the relationship between the dependent variables and the independent variables, depending on a third variable. This test was important as it tested the boundary conditions under which the findings from Equations 1 and 2 held. Thus, to determine the moderating effects of company size on the link between ESG and financial performance on JSE-listed firms, a moderating effects model was developed (Ahmad et al. 2021; Chen and Xie 2022).

$$\begin{aligned} lMV_{it} = \beta_0 + \beta_1 lESG_{it} + \beta_2 lenv_{it} + \beta_3 lsoc_{it} + \beta_4 lcg_{it} + \beta_5 ESGH_{it} + \beta_6 ESGL_{it} + \beta_7 lESG_{it} \\ * lta_{it} + \beta_8 lenv_{it} * lta_{it} + \beta_9 lsoc_{it} * lta_{it} + \beta_{10} lcg_{it} * lta_{it} + \beta_{11} lESGH_{it} \\ * lta_{it} + \beta_{12} lda_{it} + \beta_{13} lrev_{it} + \beta_{14} capex_{it} + \beta_{15} etr_{it} + e_{it} \end{aligned} \quad (3)$$

$$\begin{aligned} lEPS_{it} = \beta_0 + \beta_1 lESG_{it} + \beta_2 lenv_{it} + \beta_3 lsoc_{it} + \beta_4 lcg_{it} + \beta_5 ESGH_{it} + \beta_6 ESGL_{it} + \beta_7 lESG_{it} \\ * lta_{it} + \beta_8 lenv_{it} * lta_{it} + \beta_9 lsoc_{it} * lta_{it} + \beta_{10} lcg_{it} * lta_{it} + \beta_{11} lESGH_{it} \\ * lta_{it} + \beta_{12} lda_{it} + \beta_{13} lrev_{it} + \beta_{14} capex_{it} + \beta_{15} etr_{it} + e_{it} \end{aligned} \quad (4)$$

The moderating effects model Equations (3) and (4) are similar to Equations (1) and (2). If the coefficients in Equations (3) and (4) are significant and have the same sign as those in Equations (1) and (2), it means that firm size has a magnifying effect on the relationship between ESG disclosure and financial performance (Ahmad et al. 2021).

4. Results and Discussions

4.1. Descriptive Statistics

Table 2 below sows the summary descriptive statistics. The mean was used to measure the central tendency of the data, and the standard deviation was used to measure the dispersion of the data around the mean. Market capitalisation, which measures the financial performance of a firm, is 25.577%, and a low standard deviation of 0.987 indicates homogeneity in financial performance between firms (Alfalih 2023). The average values of the ESG dimension show corporate governance with the highest of 4.401, followed by social performance with 3.408, and environment having the lowest score of 3.86 among the

JSE-listed firms. This implies that JSE-listed firms consciously disclose corporate governance practices in their reports, and this could be attributed to the adherence to the King Code as a mandatory listing requirement. ESG score, market capitalisation, social score, corporate governance score, environment score, total assets, and revenue have low standard deviations ranging from as little as 0.238 to 1.533. This implies that the variables' data is clustered around the mean. The effective tax rate has the highest standard deviation of 248.332 and the highest mean of 41.284. This implies that effective tax rate data is scattered over a wide range. The data is normally distributed because 70% of the data falls within the 1.533 standard deviation. The total number of observations was 4985.

Table 2. Summary Descriptive Statistics of variables.

Variable	Obs	Mean	Std. Dev.	Min	Max
Lneps	488	1.401	1.463	−4.605	5.696
Lnmcap	501	25.577	0.987	23.447	28.515
Lnrevenue	496	23.985	1.367	15.895	26.092
lntotal assets	499	24.946	1.533	21.732	28.663
lnESG	501	3.86	0.31	−0.23	4.313
lnENV	489	3.157	1.02	−1.102	4.351
lnSOC	500	3.408	0.478	1.106	4.194
lnCG	501	4.401	0.238	0.866	4.598
Capex	496	−8.564	11.088	−90.521	0
eff tax rate	501	41.284	248.332	0.016	5491.111
debt asset ratio	501	18.295	12.638	0	70.266

4.2. Variance Inflation Factor of Independent Variables

The variance inflation factor (VIF) measures how much of the variance of a regression coefficient is inflated due to multicollinearity in the model. VIF results in Table 3 below 10 show severe multicollinearity, and variables with scores above 10 should be excluded from the model. VIF results between 5 and 10 show high multicollinearity in the variables. VIF results below 5 reveal moderate multicollinearity and should be accepted in the model.

Table 3. Variance Inflation Factor (VIF).

Variable	VIF	1/VIF
InESG	16.78	0.059604
IneEnv	4.66	0.214635
InSoc	4.63	0.215971
InCG	4.34	0.230584
lnRevenue	2.77	0.361481
lnTot Assets	2.01	0.497253
lnEPS	1.75	0.570196
Debt-Asset ratio	1.25	0.801581
Effective tax rate	1.12	0.892188
Capex	1.08	0.928588
Mean VIF	4.04	

Below, Table 3 shows the VIF results of the variables in the model. The composite ESG variable has the highest VIF of 16.78, which shows serious multicollinearity. This serious multicollinearity emanates from the fact that the ESG score value is a combination of the environmental score, social score and corporate governance performance of a firm. Thus, to ensure that the models are not inflated due to multicollinearity, where the total ESG score variable is included in the model, the environment score variable, social score variable and corporate governance score variable are excluded from that model. The

environment score variable, social score variable and corporate governance score variable had moderate VIF results of 4.66, 4.63 and 4.34. These results were a bit high but were within the acceptable levels of VIF. Revenue (2.77) and total assets (2.01) have low VIFs, which are acceptable. Debt-to-assets ratio (1.25), effective tax rate (1.12) and capex (1.08) have negligible multicollinearity in the model. The overall model has a mean VIF of 4.04, which shows an average multicollinearity and is acceptable. However, this average 4.04 VIF is skewed by the high ESG score VIF of 16.78.

4.3. Correlation Matrix of Independent Variables

A pairwise correlation matrix was conducted after the variance inflation as a diagnostic and robustness test. Table 4 above shows that environment score (0.748), social score (0.759) and corporate governance (0.785) have a highly significant and correlated relationship with ESG score. This finding helps explain the high ESG score VIF of 16.78, which is heavily influenced by the environment score. Social score and corporate governance score variables.

Table 4. Pairwise Correlation.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) lnmcap	1.000										
(2) lnEPSY	0.058	1.000									
(3) lnrevenue	0.184 *	0.565 *	1.000								
(4) ln_total_assets	0.231 *	0.359 *	0.660 *	1.000							
(5) lnESG	0.282 *	0.054	0.110 *	0.054	1.000						
(6) lnENV	0.210 *	−0.004	0.089	−0.053	0.748 *	1.000					
(7) lnSOC	0.210 *	0.073	0.173 *	0.126 *	0.759 *	0.507 *	1.000				
(8) lnCG	0.137 *	0.083	0.102 *	0.117 *	0.785 *	0.218 *	0.239 *	1.000			
(9) capex	−0.054	0.016	0.071	0.067	−0.066	−0.120 *	−0.109 *	0.004	1.000		
(10) eff_tax_rate	−0.067	−0.187 *	−0.061	−0.070	0.062	0.055	0.059	0.024	−0.071	1.000	
(11) debt_asset_ratio	0.114 *	−0.202 *	−0.037	−0.186 *	0.221 *	0.189 *	0.159 *	0.144 *	−0.235 *	0.046	1.000

* shows significance at $p < 0.05$.

4.4. Impact of ESG Performance on Firm Financial Performance Using a Two-Step System GMM

4.4.1. Interpretation of Results

Model 1 in Table 5 shows a significant positive relationship between social performance, corporate governance performance, and market value. However, environmental performance has a negative, insignificant relationship with market value, *ceteris paribus* (Pulino et al. 2022). Model one further shows a significant and positive relationship between social performance and market value of 0.227 at the 5% significance level (Aydoğmuş et al. 2022; Alfalih 2023). This implies that a 1% increase in social investment in the short run will translate to a 22.7% increase in market value. This finding aligns with Ahmad et al. (2021) who observed a positive and significant relationship between social performance and market capitalisation. Interestingly, corporate governance has a significantly high positive effect on market value at the 1% significance level for JSE-listed firms in the short run. A 1% increase in the corporate governance performance of a firm will lead to an 82.7% increase in the market value of a JSE-listed firm (Ahmad et al. 2021; Pu 2023; Aydoğmuş et al. 2022). This significant relationship between corporate governance and market value can be attributed to the mandatory adherence to the King Code as a listing requirement for all JSE-listed firms (Maubane et al. 2014; Yoon et al. 2018). In addition, from the data analysis, JSE-listed firms have consistently scored the highest in corporate governance compared to other ESG scores. There is also a significant negative relationship between total assets, the debt-to-assets ratio, and market value at the 5% significance level. The environment has a weak, negative, insignificant relationship with market performance. This finding aligns with Rahman et al. (2023) and Aydoğmuş et al. (2022), who observed a negative relationship between environmental scores and return on assets.

Table 5. Impact of ESG performance on firm financial performance using a two-step system GMM results.

Models	(1) Lnmcap	(2) lnmcap	(3) lnEPSY	(4) lnEPSY
L.lnmcap	0.847 ***	0.978 ***		
	(0.086)	(0.13)		
Lnrevenue	0.194	0.397 *	0.232	0.314
	(0.154)	(0.233)	(0.292)	(0.27)
ln_total_assets	−0.198 **	−0.386 **	0.174	0.277
	(0.09)	(0.18)	(0.219)	(0.175)
LnENV	−0.06			−0.042
	(0.051)			(0.049)
LnSOC	0.227 **			−0.39 **
	(0.1)			(0.198)
LnCG	0.827 ***			−0.09
	(0.263)			(0.285)
Capex	0.001	0.001	−0.012	−0.018 **
	(0.007)	(0.007)	(0.013)	(0.009)
eff_tax_rate	0.00	0.002	−0.008 ***	−0.007 ***
	(0.001)	(0.003)	(0.001)	(0.001)
debt_asset_ratio	−0.011 **	−0.015 *	−0.012	−0.018 **
	(0.005)	(0.008)	(0.008)	(0.008)
ESGH	−0.08	−0.439 ***	0.245	0.169
	(0.081)	(0.169)	(0.228)	(0.154)
LnESG		1.1 **	−0.066	
		(0.498)	(0.838)	
L.lnESPY			0.32 **	0.387 **
			(0.149)	(0.163)
_cons	0.261	−3.078	−8.313	−11.31 **
	(2.257)	(3.629)	(5.225)	(4.466)
Observations	407	410	396	393
Instruments	32	18	33	41
Counter Effects	No	No	No	No
Time Effects	No	No	No	No
Hansen's j test	[0.633]	[0.225]	[0.314]	[0.518]
AR[1]	[0.001]	[0.012]	[0.019]	[0.024]
AR[2]	[0.633]	[0.782]	[0.890]	[0.615]
Counters	48	48	48	48

Standard errors are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Model 2 in Table 5 shows a significant and positive relationship between the composite ESG performance and market value of 1.1 at the 5% significance level. (Ahmad et al. 2021; Junius et al. 2020; Chininga et al. 2023). This implies that a percentage increase in ESG performance of a firm will lead to a 110% increase in market value of a JSE-listed firm. The high positive relationship between ESG and market value can be attributed to the strong positive corporate governance pillar, as shown in Model 1. Similarly, Nguyen et al. (2022) observed a positive relationship between the ESG score and accounting performance indicators. On the other hand, high-performing ESG companies had a significant negative relationship with the market performance of −0.439 at the 1% significance level. This negative relationship is supported by the literature, which states that the impact of ESG on firm performance depends on the level of ESG maturity. In the short run, when ESG is still a new phenomenon in the firm, it negatively affects firm performance due to high implementation costs (Yoon and Chun 2022). The debt-to-assets ratio has a weak, negative, significant relationship with a market capitalisation of −0.15 at the 10% significance level.

Total assets have a weak negative relationship with a market capitalisation of −0.386 at the 5% significance level, and revenue has a positive significant relationship with a market value of 0.397 at the 1% significance level.

Model 3 in Table 5 reveals that composite ESG performance has a weak, insignificant negative relationship with earnings per share of −0.066. This finding is in contrast to the findings of Chininga et al. (2023), who observed a positive effect of ESG on return on equity. In the same light, the effective tax rate has a very weak, negative, significant relationship with earnings per share of 0.008 at a 1% significance level. This could be attributed to the negative effect taxation has on the earnings of a company.

Model 4 in Table 5 presents interesting results between individual ESG scores and earnings per share. The environmental score has a negative, insignificant relationship with earnings per share of −0.042. This finding is similar to Pulino et al. (2022) and Yoon et al. (2018), who observed a negative relationship between the environment scores and return on assets. However, the social score has a significant negative relationship with earnings per share of −0.39 at a 5% significance level. This implies that a percentage increase in social investments will translate into a 39% decline in earnings per share. JSE's top 40 firms are socially sensitive to the social score. This finding is contrary to the positive effect of social performance on the market value of a firm found in Model 1. Corporate governance has a negative, insignificant relationship with earnings per share of −0.09. This insignificant relationship is contrary to the positive significant relationship between corporate governance and the market value of a firm. Interestingly, capital expenditure has a significant negative relationship with EPS of −0.018 at a 5% significance level. This is the only significant relationship in all four models. The effective tax rate has a significant negative relationship with EPS of −0.007 at a 1% significance level. This significant negative relationship is consistent for the two models related to EPS. This could be attributed to the adverse relationship between taxes and earnings. Debt-to-assets ratio also has a significant negative relationship with EPS of −0.018 at a 5% significance level. This negative significant relationship is consistent in all the models except for Model 3.

Models 1 and 2 in Table 5 show investor sentiments towards ESG implementation by JSE-listed firms whereas Model 3 and 4 in Table 5 show the effects of ESG implementation on the earning ability of a firm. Thus, from Model 1 and 2 social score, governance score and the total ESG score have a significant positive effect on the market value of a firm which implies that investors significantly consider these variables in their investment decisions in South Africa. On the other hand, the social pillar is the only significant variable with a negative effect on earnings per share on JSE-listed firms. This result implies that investment in social activities is negatively affecting the earnings of JSE-listed firms. Despite the social score having a significant positive effect on market value, when compared with the negative significant effect of the social score on earning per share, the social score has an overall negative effect of 0.163 (16.3%). Social investment by South African firms generally chews into earnings than the reward being given by investors for social investments programmes. This could be because social investment programmes are mostly implemented as part of regulatory compliance, for instance, adherence to B-BBEE Act and the Financial Sector Charter. Overall, the investor sentiments towards ESG implementation have greater significant effects on share prices than the negative impact of ESG implementation on the earning ability of a firm.

4.4.2. Diagnostic Test for System GMM

Hansen Test

A Hansen test was conducted to test for overidentifying restrictions (Hansen 1982). The test was conducted to determine whether the instruments used in the model were

valid, that is, to test if they were uncorrelated with the error term. The null hypothesis is that instruments are valid, and instruments are valid if the *p*-value is greater than 0.05 (Roodman 2009). All the models in Table 5 passed the Hansen test, with Model 1 having a *p*-value of 0.633, and Model 2 having a *p*-value of 0.225, and accepted the null hypothesis. Model 3 had a *p*-value of 0.314, and Model 4 had a *p*-value of 0.518; the study accepted the null hypothesis and concluded that the instruments used in the four models in the study were likely to be valid. Roodman (2009) further stated that to successfully eradicate the overidentification of restrictions in a system GMM, the *p*-values should be greater than 0.25, and Model 1 (0.633), Model 3 (0.314), and Model 4 (0.518) surpass this requirement, with Model 2 within the range (0.225). This two-step system, GMM, was the best-fit methodology.

4.4.3. Arellano Bond Test for Autocorrelation

The Arellano and Bond test was used to test for autocorrelation in the residuals of the first differenced Model AR (1) and the second differenced Model AR (2). The study, being a two-step system GMM, used the second differenced model AR (2) results to accept or reject the null hypothesis. The decision criteria are that if the *p*-value is greater than 0.05, the study fails to reject the null hypothesis, meaning that there will be no evidence of second-order correlation (Roodman 2009). Model 1 in Table 5 has an AR (2) *p*-value of 0.633, which is above 0.05; the study accepts the null hypothesis and concludes there is no autocorrelation in the error terms in Model 1. Model 2 in Table 5 has an AR (2) *p*-value of 0.782, accepting the null hypothesis. Model 3 and Model 4 in Table 5 have equally significant AR (2) *p*-values of 0.890 and 0.615, respectively, failing to reject the null hypothesis for all four models. To further show the reliability of the AR (2) results, all models must fail the AR (1) results.

4.5. Firm Size Moderating Effects Model Using Two-Step System GMM

4.5.1. Interpretation of Results

In Model 1 Table 6, firm size has a weak, positive, significant moderating effect on ESG of 0.101 at a 5% significance level. However, under the firm size moderating effects, ESG has a strongly significant negative relationship with market capitalisation of −2.453 at a 5% significance level. (Zaiane and Ellouze 2023). This implies that firm size has a negative magnifying effect on the relationship between ESG and financial performance. This negative relationship between ESG and financial performance could be attributed to increased public scrutiny from various stakeholders that accompany large firms (Bissoondoyal-Bheenick et al. 2023; Khan 2022; Wong and Zhang 2022). Model 1 equally reveals that firm size has a weak negative magnifying effect in high-performing ESG firms of −0.009 at a 1% significance level. This negative relationship is also shown in Table 5, where high-performing ESG firms had a significant negative relationship with market performance of −0.439 at a 1% significance level. Firm size has a weak, significant magnifying effect on ESG in high-performing ESG firms. The effective tax rate has a very weak, negative, significant relationship with the market performance of −0.001. This finding is almost similar to the dynamic panel data analysis in Table 5, where the effective tax rate was neutral and had no effect on market performance.

Table 6. Firm size moderating Effects Model Using two-step system GMM results.

	(1) Lnmcap	(2) Lnmcap	(3) lnEPSY	(4) LnEPSY
L.lnmcap	0.91 ***	0.951 ***		
	(0.023)	(0.055)		
Lnrevenue	0.017	0.012	0.366 ***	0.186
	(0.013)	(0.019)	(0.075)	(0.114)
ln_total_assets	−0.369 **	−1.972 **	−0.247	4.595 ***
	(0.181)	(0.98)	(0.571)	(1.576)
lnESG	−2.453 **		−5.626 *	
	(1.198)		(3.287)	
lnESG_TA	0.101 **		0.17	
	(0.047)		(0.133)	
Capex	0	−0.003	−0.023 ***	−0.014 ***
	(0.002)	(0.003)	(0.003)	(0.003)
eff_tax_rate	−0.001 ***	−0.001 **	−0.008 ***	−0.008 ***
	(0)	(0)	(0)	(0)
debt_asset_ratio	−0.01 ***	−0.008 ***	−0.015 ***	−0.006
	(0.002)	(0.002)	(0.005)	(0.007)
ESGH_TA	−0.009 ***	−0.016 ***	0.027 ***	0.041 ***
	(0.003)	(0.004)	(0.004)	(0.009)
lnENV		1.233 ***		−0.924
		(0.341)		(0.904)
lnSOC		0.362		−4.671 *
		(0.842)		(2.452)
lnCG		−11.477 **		28.214 ***
		(5.435)		(9.834)
lnENV_TA		−0.051 ***		0.036
		(0.014)		(0.038)
lnSOC_TA		−0.014		0.162
		(0.036)		(0.101)
lnCG_TA		0.492 **		−1.139 ***
		(0.217)		(0.397)
L.lnESPY			0.228 ***	0.174 ***
			(0.013)	(0.037)
_cons	11.213 **	47.081 **	3.706	−114.916 ***
	(4.446)	(23.935)	(12.829)	(38.878)
Observations	410	407	396	393
Instruments	41	37	41	37
Counters	48	48	48	48
AR (1)	0.000	0.000	0.005	0.008
AR (2)	0.496	0.340	0.764	0.34
Hansen's J test	0.249	0.116	0.124	0.233

Corrected standard errors are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Model 2 in Table 6 presents interesting results that are unique and different from the findings from Table 5. Under the firm size moderating effects, the environment has a significant positive effect on market capitalisation of 1.233 at a 1% significance level (Zaiane and Ellouze 2023). This strong positive significant environment score on market performance could be attributed to large firms being sensitive to environmental issues such as global warming and being forced to engage in both symbolic and actual CSR activities, unlike their SME counterparts. The JSE-listed financial institutions created and adopted climate change policies from 2020 onwards after NGO investor activists requested such disclosure at the Standard Bank AGM (Cassim 2022; Zaiane and Ellouze 2023). Conversely, the firm size moderating effect on the environment has a negative effect

on the market performance of −0.051 at a 1% significance level. This could be attributed to the increased costs associated with implementing environmental programmes (Alfalih 2023). On the other hand, under firm size moderation effects on social performance, both the interacting variable and the social score have insignificant effects on market performance. The moderator is different in sign and magnitude from the social performance in this equation, and this implies that firm size does not influence the relationship between social performance and market performance. This insignificant social performance finding is attributed to legislation such as the FSC and B-BBEE Act, which mostly governs the social investment practices of firms in South Africa, regardless of size (Viviers and Els 2017). Corporate governance has a strongly negative significant relationship with market capitalisation of −11.477 at a 5% significance level under firm size moderating effects. Bissoondoyal-Bheenick et al. (2023) observed that a decline in corporate governance led to a decline in excess returns. This strong negative effect of corporate governance on market capitalisation under firm size moderating effects implies that for JSE-listed firms, slacking on corporate governance issues translates to a serious decline in share prices. Adherence to good corporate governance practices and the King Code IV is a mandatory listing requirement for JSE-listed firms. Failure to adhere to the King Code can lead to the delisting of a firm (Ho and Park 2019; Taplin 2021). This finding contrasts with the positive significant firm size interacting variable of corporate governance of 0.492 at a 5% significance level on market performance. This implies that large firms boost the positive effects of corporate governance disclosure.

Model 3 in Table 6 shows that revenue has a significant positive effect on earnings per share of 0.366 at a 1% significance level. In addition, firm size moderates the relationship between ESG and earnings per share. ESG has a strong negative significant relationship with EPS of −5.626 at a 10% significance level (Shaikh 2022). On the other hand, the firm size moderator on ESG has an insignificant effect on earnings per share. This implies that the firm size effect on ESG does not influence the earnings per share of JSE-listed companies. Capital expenditure (−0.023), effective tax rate (0.008), and debt-to-assets ratio (−0.015) have a very weak, negative, significant relationship at a 1% significance level with EPS when firm size is a moderating factor. This finding is relevant to capital expenditure, effective tax rate, and leverage, which reduce the earnings of a firm and ultimately the EPS of a firm. In addition, large firms tend to be highly leveraged and have larger tax obligations than smaller firms. The firm size moderating effect of high-performing ESG firms has a weak, significant effect on EPS of 0.27 at a 1% significance level.

Under Model 4 in Table 6, social performance has a strong negative relationship with earnings per share of −4.671 at a 10% significance level. However, these findings differ in sign and level of significance from the firm size moderator of social performance, which has an insignificant effect on earnings per share. In addition, corporate governance has a strong and significant effect on earnings per share of 28.214 at a 1% significance level under firm size moderating effects (Ahmad et al. 2021; Pu 2023; Aydoğmuş et al. 2022). This implies that good corporate governance practices can seriously improve the earning power of a firm (Alfalih 2023). This is in contrast, in both sign and magnitude, to the firm size corporate governance moderator, which has a strong negative significant effect on earnings per share of −1.139 at a 1% significance level (Bissoondoyal-Bheenick et al. 2023). The strong effect of corporate governance on earnings per share shows the importance of good corporate governance practices on the earnings ability of a company (Alfalih 2023). Poor corporate governance practices can lead to both closure and delisting from the JSE stock exchange. Under firm size, the moderating effects of capital expenditure (−0.014) and effective tax rate (−0.008) continued to have a weak negative relationship with EPS. These findings signify the negative effect that capital expenditure and effective tax rate have on

the earnings of a company. Total assets, interestingly, have a strong positive significant effect on EPS of 4.595 at a 1% significance level under firm size moderating effects. This implies that total assets, when efficiently utilised, can lead to increased earnings in a listed firm. High ESG-performing firms have a weak and significant moderator of 0.041 at a 1% significance level to earnings per share.

4.5.2. Diagnostic Tests for Firm Size Moderating Effects System GMM

Hansen Test

A Hansen test was conducted to test for overidentifying restrictions (Hansen 1982). The test was conducted to determine whether the instruments used in the model were valid, that is, to test if they were uncorrelated with the error term. The null hypothesis is that instruments are valid, and instruments are valid if the *p*-value is greater than 0.05 (Roodman 2009). All the models in Table 6 passed the Hansen test, with Model 1 having a *p*-value of 0.249 and Model 2 having a *p*-value of 0.116, and accepted the null hypothesis. Model 3 had a *p*-value of 0.124, and Model 4 had a *p*-value of 0.233. The study accepted the null hypothesis and concluded that the instruments used in the four models in the study were valid and uncorrelated with the error term.

4.5.3. Arellano Bond Test for Autocorrelation

The Arellano and Bond test was used to test for autocorrelation in the residuals of the first differenced model AR (1) and the second differenced model AR (2). The study, being a two-step system GMM, used the second differenced model AR (2) results to accept or reject the null hypothesis. The decision criteria are that if the *p* value is greater than 0.05, the study fails to reject the null hypothesis, meaning that there will be no evidence of second-order correlation (Roodman 2009). Model 1 in Table 6 has an AR (2) value of 0.496, which is above 0.05, thus, we accept the null hypothesis and say there is no autocorrelation in the error terms in Model 1. Model 2 in Table 6 has an AR (2) *p*-value of 0.340, accepting the null hypothesis. Model 3 and Model 4 in Table 6 have equally significant AR (2) *p*-values of 0.764 and 0.34, respectively, failing to reject the null hypothesis for all four models. To further show the reliability of the AR (2) results, all models must fail the AR (1) results, and all models had AR (1) results below a *p*-value of 0.005.

4.6. Discussion of Findings

The study found a positive relationship between the ESG pillar, social pillar, corporate governance pillar, and market capitalisation, which represented market performance among the JSE top 40 listed firms (Ahmad et al. 2023; Aydoğmuş et al. 2022). Firm market performance was represented by market capitalisation and earnings per share. The study found interesting results using a two-step system GMM. Market value was positively and statistically influenced by corporate governance at a 1% significance level (Aydoğmuş et al. 2022). A percentage increase in corporate governance will lead to an 82.7% increase in the market capitalisation of a firm. Good corporate governance practices had a significant positive effect on firm value. In South Africa, adherence to the King Code is a mandatory listing requirement on the JSE. In addition, good corporate governance practices are essential for business continuity. Social performance, in the same line, had a significant positive relationship at 5% with the market value of JSE's top 40 firms (Aydoğmuş et al. 2022). A percentage increase in social performance would translate into a 22.7% increase in the market value of a JSE-listed firm. This positive relationship between social performance and firm value could be attributed to acts such as the B-BBEE Act and the FSC, which force firms to address social and economic inequalities in the marginalised black communities. Each year, the firms are given a BEE rating where 1 is the highest rating, indicating that the firm is seriously considering social and economic redressing of the marginalised black

population in its decisions. Furthermore, the social pillar reflects the firm's core values, which are linked to the well-being of the community (Alfalih 2023). The environment score had a negative, insignificant relationship with market value. This negative effect could be attributed to increased costs associated with environmental investments, as well as perceived potential costs or penalties associated with environmental initiatives by South African investors. The total ESG score had a strong positive significant relationship of 1.1 with the market performance at a 5% significance level. This strong positive relationship between ESG and market performance is mostly driven by corporate governance. This result aligns with Alfalih (2023) and Chininga et al. (2023), who concluded that firms that engage in ESG activities that positively affect communities experience a decline in earnings when they start to engage in environmental and social investments. However, the decline in earnings is compensated by increased share price and ultimately firm value.

In addition, the interaction between firm size, the ESG pillars, and total ESG presented fascinating and conflicting results. The environment score (1.233) had a positive significant relationship with market capitalisation, whilst corporate governance (−11.477) and total ESG (−2.453) had a negative significant relationship with market capitalisation. A percentage decrease in corporate governance practices will lead to an 11.477 times decrease in market capitalisation. For example, the recent Steinhoff and Tongaat-Hulett scandals led to a serious plunge in their respective stock prices and eventually negatively affected the market performance of these companies (Andrew 2020; Rossouw and Styan 2021). This implies that firm size encourages ESG and corporate governance implementation, and failure to implement ESG has serious negative consequences on share price and ultimately market value. The strong negative corporate governance effect influenced the overall ESG score impact on market capitalisation. Conversely, firm size encourages environmental initiatives as it positively affects market capitalisation. This could still be attributed to increased public scrutiny that follows large firms. Hence, forcing the firms to consider environmental issues in their investment and operational activities. In addition, this relationship can be explained by an increase in green investors who are considering environmental issues in their investing activities, with environmentally friendly firms being considered attractive investment opportunities. Firm size has a positive moderating role in the relationships between ESG, corporate governance, and market capitalisation. On the other hand, firm size has a negative moderating role in the relationship between the environment and market capitalisation. In the same disposition, firm size has a negative moderating role in the relationship between corporate governance and earnings per share. In contrast, corporate governance has a strong positive and significant relationship with earnings per share under firm size moderating effects. This could be attributed to the effects of strong corporate governance practices on business continuity and earning ability. Poor corporate governance practices can lead to the closure of listed firms. Firm size had an insignificant moderating effect on individual ESG pillars and total ESG performance as far as earnings per share are concerned.

4.7. Conclusions

The study revealed that when firms engage in ESG activities, they are rewarded by investors with increased market share prices. This increased share price signifies a positive social contract with various stakeholders. The study also found a positive relationship between profitability and ESG in terms of market value performance indicators. Additionally, the study incorporated disaggregated ESG dimensions to identify the impact of each specific dimension, as the total ESG pillar could obscure analysis. The study identified both linear and non-linear effects of ESG activities on firm performance, measured by market capitalisation and earnings per share.

A firm's ESG disclosure and practices are relevant information considered by market participants in making investment decisions, not only by product and service users. Additionally, based on the disaggregated ESG findings reported, management should be able to identify, address, and improve the ESG dimensions, which may impact financial performance. For example, the article reveals a strong positive relationship between ESG performance and market value among JSE Top 40 listed firms, with corporate governance and social performance having particularly significant impacts. Specifically, good corporate governance practices were found to have a substantial positive effect on market capitalisation, indicating that adherence to governance standards, such as those outlined in the King Code, is vital for enhancing firm value. Additionally, social performance, driven by initiatives like the B-BBEE Act, showed a positive correlation with market value, reflecting the growing importance of addressing social inequalities in South Africa.

The study's findings contribute to Legitimacy Theory and Signaling Theory by demonstrating that firms with strong corporate governance and social performance not only gain legitimacy in the eyes of stakeholders but also signal their reliability, sustainability, and long-term viability, which positively impacts their market value. At the same time, the study suggests that environmental performance, while important for long-term sustainability, may not yet be as strongly valued in the South African market, thus limiting its ability to serve as an effective signal to investors. This dual contribution enhances the understanding of how ESG practices serve both as legitimacy mechanisms and signals of firm quality in the emerging market context.

4.8. Limitations of the Study

Data used were limited to the top 40 JSE firms from 2002 to 2022. However, most firms started reporting on ESG from 2009.

4.9. Areas of Future Research

Conducting a study that includes all the currently listed firms on the JSE to measure the impact of ESG on financial performance.

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