Impact of ESG Factors on Profitability: An Empirical Analysis of JSE-Listed Firms in South Africa

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The study examines the relationship between environmental, social, and governance (ESG) activity and firm shareholder wealth. This research is necessary because of increasing global pressure on companies to align with ESG standards while maintaining profitability, particularly in emerging markets such as South Africa, where ESG adoption is still evolving. We investigate whether ESG performance contributes to shareholder value creation and whether a firm's investment in ESG might reduce shareholder returns in the short run. Despite a growing body of research on ESG performance, there remains a lack of consensus on its impact in emerging economies. Most of the literature is concentrated on developed markets, leaving a gap in understanding how ESG performance affects firms in South Africa's unique socioeconomic context. Our sample includes a panel of 74 Johannesburg Stock Exchange (JSE)-listed firms in South Africa over the period 2010–2022. We estimate panel regressions for disaggregated data via different industry groupings. The disaggregated data analysis shows mixed results concerning the impact of ESG factors on returns on equity and share returns. For example, financial institutions were found to have a negative relationship between ESG performance and return on equity, whereas other non-financial companies have a positive relationship between ESG performance and return on equity. Different ESG factors influence returns on equity and share returns differently. This study contributes to the literature by offering fresh empirical evidence from South Africa and uncovering the nuanced industry-specific effects of ESG activities, thus providing valuable insights for policymakers, investors, and corporate decision-makers.

Keywords: environmental, social, governance, firm value, share returns, return on equity, panel data

1. Background

The importance of environmental, social and governance (ESG) factors in today's corporate sector is underscored by the proliferation of many products, business activities and

research aimed at understanding ESG value creation. In recent years, interest in understanding the relationships among increased ESG data, firm profitability and shareholder value creation has increased. However, the available literature shows inconclusive empirical findings (Miralles-Quirós et al., 2019; Welch and Yoon, 2022). For instance, Miralles-Quirós et al. (2019) reported that banks' social performance has a negative correlation with shareholder value creation and further concluded that the relationship between ESG performance and banks' shareholder value creation is complex and requires further research. ESG improvement(s) can increase share prices, but this is mostly attributed to the information effect response of investors (Mercereau et al., 2022). Investors respond to information released, but the increase in share price may not fully reflect the actual value created by the firm. Using employee perceptions, Welch and Yoon (2022) discovered that companies with highly rated managers and strong ESG performance had substantially higher stock returns in the future than companies with low ratings did; similarly, Niccolò et al. (2020) reported that investment related to ESG performance has an impact on shareholders' wealth, decreasing dividend payouts. The reduction in dividends may be considered a reduction in shareholder wealth. In view of these contradictions and incomplete findings, this study seeks to unravel the impact of ESG factors on firm profitability in South Africa.

The purpose of this study is to determine how ESG issues affect business profitability in South Africa. The country's changing ESG legislative landscape, socioeconomic difficulties, and industry-specific exposure to ESG risks necessitate special attention to South African listed companies. The Companies and Intellectual Property Commission (CIPC) integrated the International Sustainability Standards Board (ISSB)'s S1 and S2 standards, making South Africa one of the first African countries to embrace globally standardised ESG disclosure frameworks (BR-AG, 2024). Furthermore, the Johannesburg Stock Exchange (JSE) has long supported ESG through disclosure rules and sustainability indices; however, there is still little scholarly research on the effects of ESG on businesses and the sector (Mgilane et al, 2023). Furthermore, South Africa has developmental issues such as energy dependence, inequality, and environmental degradation, which make ESG performance even more important for financial sustainability and corporate responsibility (Du Toit & Lekoloane, 2018). The necessity for disaggregated ESG analysis is further highlighted by the presence of industries, including mining, financial services, and utilities, on the JSE, as these sectors have different ESG profiles and risks (Matemane et al, 2024). Despite this, few empirical studies have examined how ESG factors affect business performance in various sectors in South Africa, which leaves a significant gap that this study attempts to fill.

Through its socially responsible investment (SRI) index and other ESG-related disclosure standards, the Johannesburg Stock Exchange (JSE) has long supported sustainability. Nevertheless, despite these advancements, there is still a dearth of empirical data regarding the financial effects of ESG in South Africa (Chininga et al., 2024). The need for targeted ESG research is further supported by South Africa's economic structure. Owing to the nation's ongoing issues of inequality, high unemployment, and reliance on carbon-intensive industries, ESG considerations are essential for long-term financial sustainability as well as reputation management (Vox, 2025). Another layer of significance is added by the industry mix; sectors including mining, energy, and financial services control the JSE and are subject to stakeholder expectations and ESG-related risks (Chininga et al., 2024). Understanding the firm-level impacts of ESG in these developing and structurally unique countries is crucial, as the concept

continues to gain support among investors and policymakers worldwide (Reuters, 2025). ESG issues are also becoming increasingly integrated into national economic policy, as seen by South Africa's international commitments, including its leadership in the Just Energy Transition Partnership (JETP) and recent initiatives to give climate finance top priority during its G20 presidency (Reuters, 2025). These factors highlight how important context-specific ESG research is for educating corporate decision-makers and investors in emerging markets.

Many leading companies have been trying to respond to the overall issue of investor interest in ESG, but these responses have achieved mixed results (Aust, 2013). Iurkov et al. (2024) find that firms gain value from forming alliances with high ESG performance partners. Managers are under more pressure to allocate capital for long-term sustainable projects and avoid projects that may not pay off because of longer-term environmental issues (Henisz et al., 2019). In evaluating investments, the financial manager must consider both their primary role in maximising shareholder returns and their focus on sustainability and ESG even though this might affect returns to shareholders. Recent evidence also suggests that ESG performance may not always translate into superior financial outcomes. Narula et al. (2024) examined firms in an emerging market context and found that none of the individual ESG components showed a statistically significant relationship with firm performance, indicating that the financial impact of ESG initiatives can vary across contexts. Furthermore, while many ESG professionals stress their role in creating shareholder value, they do not explain how this value creation occurs, prompting further inquiry (Cornell & Shapiro, 2021).

ESG policies have a favourable and substantial impact on a company's market (Yoon et al., 2018). Capital markets include a variety of investors, some of whom invest in the short term and some in the long term; however, what is positive and favourable for long-term investors might not be considered ideal by short-term investors. Considering this misconception, corporate efforts to address environmental and social issues constitute mainly a cost to the business, while meeting the demands of certain corporate stakeholders effectively ends up reducing shareholder value (Kotsantonis et al., 2016). Huang (2022) claims that it is unclear how ESG considerations are considered for earnings projections from a valuation perspective. Huang (2022) suggest that more investigations be performed to determine the circumstances in which signals from ESG data assist shareholders in evaluating the long-term value of a company. The traditional drive to maximise shareholder value means that some employees avoid ESG initiatives that reduce corporate profitability (Sheehan et al., 2023).

Sustainability events attract more attention from financial analysts and lead to an increase in the percentage of shares held by long-term investors (Durand et al., 2019). This could be the result of sounding goods rather than from actual good deeds, as investors respond to ESG data. Most companies report their policies on climate change and environmental and social issues instead of the actual results achieved (Durand et al., 2019). Notably, a company's reputation can be seriously harmed by poor environmental performance, which includes problems such as pollution breaches, carbon-intensive activities, inadequate waste management, and non-compliance with environmental legislation. These "bad environmental issues" frequently result in fines, heightened regulatory scrutiny, and boycotts or negative reactions from investors and consumers who care about the environment. Furthermore, because of penalties, legal action, regulatory compliance requirements, and the demand for corrective environmental actions, such problems usually lead to increased operational expenses (Klassen

& McLaughlin, 1996; Delmas & Toffel, 2008). According to Lins, Servaes, and Tamayo (2017), reputational damage associated with environmental mismanagement can also result in a decrease in investor confidence, a decrease in market price, and eventually a loss in shareholder value. Consequently, businesses that do not implement environmentally conscious policies run the danger of both real financial failure and non-financial repercussions. Some investors avoid poor ESG performance, assuming that the factors that cause companies to receive low ESG ratings will result in weak financial results (Serafeim, 2020). Some of the time, firms with low ESG ratings could maximise profits and returns to shareholders. It is expected that ESG performance will increase company value, that actions taken to improve ESG ratings will result in either higher cash flows or lower risk, and that it is highly likely that being good can lower value for some firms (Cornell & Damodaran, 2020).

The relationship between ESG performance and business financial outcomes, specifically profitability and firm value, has been studied in recent years. After reviewing the ESG literature from the Scopus database, Postiglione et al. (2024) concluded that investor signalling and the cost of capital mechanisms are the main ways in which ESG practices impact corporate valuation. ESG participation enhances financial performance, particularly for larger enterprises, according to Shawat et al.'s (2024) analysis of panel data from MENA companies. A cross-lagged panel model analysis conducted in China in 2024 revealed a consistent positive correlation between market valuation and ESG scores. In a similar vein, Zailani and Abd Razak (2024) examined the top 100 listed companies in Malaysia and discovered that although overall ESG scores had no influence, the social component had a slight positive effect on profitability. Businesses with lower ESG scores (i.e., higher ESG risk) paradoxically had higher ROA, according to 2025 research on Indonesia's SRI-KEHATI index, indicating complex dynamics in emerging markets. The significance of dissecting ESG components was shown by a 2024 study conducted in Canada that used a Mazziotta-Pareto-based index and discovered nonlinear ESG effects on business profitability. A study by Barh et al. (2024a) revealed that ESG practices nonlinearly affect firm value and are more pronounced in China than in the USA, confirming that emerging markets differ from developed countries. Bargh et al. (2024b) investigated ESG components and reported that environmental and social performance have a greater effect on sustainable growth. Green innovation has a positive effect on firms' sustainable development, and this effect is significantly moderated by governance practices (Bargh et al 2024c).

While these studies provide valuable insights, many rely on aggregate ESG scores and broad cross-country samples. Few studies have examined regional or industry-level variances in emerging economies, and even fewer have provided thorough disaggregation across ESG aspects. Three significant contributions are provided by this paper. To determine how ESG impacts vary among South Africa's high- and low-carbon industries, this study uses industry disaggregation. Second, by concentrating solely on South African listed companies, which are often underrepresented in the ESG literature, our paper offers regional distinctiveness. Third, we use ESG decomposition, which examines the governance, social, and environmental pillars separately to determine how each affects corporate value and profitability. The study's value to ESG research is reinforced by these advances, especially in emerging market contexts where investor expectations and regulatory regimes diverge from those in industrialised economies.

Environmental and social issues require financial investment, which might reduce returns to shareholders in the short run. Corporate leaders are still divided on whether corporate ESG performance contributes to financial profit and shareholder value (Sheehan et al., 2023). To clarify the complexities of maximising shareholder returns and focusing on ESG issues, we investigate the relationship between ESG scores, and shareholder return variables. Our paper focuses on the contradiction that the role of a financial manager is to increase shareholder wealth, but ESG spending might reduce returns to shareholders in the short term, while it is believed that in the long run, ESG performance might improve returns to shareholders. We test this hypothesis via South African listed firms. To examine the effects of ESG factors on various industries independently, we estimate panel regressions for disaggregated data using several industry groups. Our research indicates that the relationship between ESG performance and return on equity (ROE) varies among industries, suggesting that diverse settings call for different approaches to ESG performance. This article is structured into five sections. Section 1 discusses the background. Section 2 reviews the literature on ESG performance and firm performance. The methodology of the analysis is explained in Section 3, and the findings are presented and discussed in Section 4. Furthermore, the limitations of the study, along with any potential future research areas, are presented in Section 5.

1. Literature Review

Stakeholder theory has been used to explain the role of ESG in enhancing shareholder wealth (Aydoğmuş et al., 2022, Fama, 2021, Freeman, 1984). This theory allows us to consider the objectives of the firm beyond the firm's profitability goal, thereby meeting the wider needs of different stakeholders. It posits that companies must consider the interests of all stakeholders, including employees, customers, suppliers, and the community, to achieve sustainable success. Furthermore, beyond the firm's immediate environment, ESG performance has been linked to sustainable development goals (SDGs), which provide a thorough framework for addressing global societal challenges (Delgado-Ceballos et al., 2023). Thus, as firms adopt ESG frameworks and practice ESG principles on the basis of the SDGs, they can achieve national and global impacts. This contrasts with the main microeconomic theory centred on profit maximisation (Aydoğmuş et al., 2022). Thus, in addition to profit considerations, the firm practices good governance, addresses social challenges and ensures environmental sustainability, which is imperative to uphold corporate reputation, reduce risks and align with regulatory expectations. Furthermore, practicing sustainable employment principles tends to increase employee morale and reduce employee turnover, thereby improving productivity. Workers tend to become more productive in an environment that cares for them and where their efforts are fairly rewarded compared with companies that do not consider employee welfare an important component of their drive for growth.

Stakeholder theory further highlights the need to consider the effects of business practices on society through their impact on climatic conditions. Firms prioritising sustainability, particularly through reducing carbon emissions and environmental degradation, achieve better financial outcomes, align with stakeholder expectations and enhance competitive advantage.

Their commitment to sustainability receives positive ratings from shareholders and funders, as witnessed through increases in share prices and exclusive access to green financing (Mathews and Kidney, 2012, Maltais and Nykvist, 2020). Thus, stakeholder engagement is even more important in South Africa, where social and environmental issues are especially important (Matemane et al., 2024). However, while theoretical arguments on the linkages between sustainability, performance and shareholder wealth point to a positive relationship, empirical studies have established mixed findings. In some studies, all ESG components have been reported to have no impact on profitability (Narula et al., 2024, Matemane et al., 2024), whereas in other studies, one or two of the components have been found to have a significant negative or positive impact (Agnese et al., 2025, Naimy et al., 2021). Nevertheless, there are those who align with the theoretical propositions of stakeholder theory, which have found that all ESG components have a positive effect on firm profitability and shareholder value (Ismail and Azman, 2024).

The discussion of the theoretical implications of the stakeholder effects of ESG performance is not complete without considering differences across industries. Understanding the typical customer base, operating environment and cost of ESG implementation for a firm is important for evaluating the context in which the business can succeed. Empirical debate has pointed to disparities in the impact of ESG performance on profitability or value in different industries (Brogi and Lagasio, 2019). Özer, G., Aktaş, N., & Çam, İ. (2023), for example, report that manufacturing and mining industries benefit from improved ESG metrics. In general, brown industries tend to have a significant effect on their ESG metrics. This is driven, among other things, by investor requirements and the need to access clean/green funding. However, in most jurisdictions, financial firms are negatively affected by ESG metrics, indicating the cost of establishing ESG frameworks (Saygili et al., 2021). The heterogeneous effects of ESG components in different industries should point to the distinctiveness of an industry's stakeholders and their interpretation of ESG success. Using stakeholder theory, we are therefore able to test the following hypotheses.

1. There is a positive relationship between ESG components and firm profitability. The relationship between the ESG component and firm profitability or value supports the notion that firms consider their wide stakeholder relations in setting their company goals.
2. The impact of ESG performance on firm profitability is homogeneous across industries, which implies that all industries are affected by ESG considerations uniformly. We test this proposition by running different regressions for different industries.

Other relevant theories used in the literature include legitimacy theory and the resource-based view (RBV). The legitimacy theory contends that businesses aim to function within the constraints and standards of their local communities. Businesses can secure ongoing access to resources and markets by legitimising their activities through the implementation of ESG principles (Suchman, 1995). This is especially important for companies that are listed on the JSE because they operate in a society where corporate responsibility is becoming increasingly expected (Ching & Gerab, 2017). Using this theory, legitimacy, as a socially derived construct,

can be achieved through ESG activities, which, in turn, are expected to result in greater profitability. Therefore, firms with higher ESG performance are expected to be more profitable. Furthermore, more environmentally sensitive industries, such as mining and manufacturing, could be expected to have a much more pronounced effect on ESG performance.

Additionally, according to the resource-based view (RBV), businesses can gain a competitive edge by creating special resources and competencies. ESG efforts can be viewed as strategic assets that produce better financial results since they are rare, precious, unique, and non-replaceable (Barney, 1991). The RBV viewpoint is supported by empirical research on JSE-listed companies, which shows that ESG performance can have a favourable impact on financial performance (Chininga et al., 2023). However, failure to convert these assets into useful income could result in increased costs and lower income.

Empirical Literature

ESG performance has a significant positive effect on firm value among Chinese listed companies (Li & You, 2025). In another study carried out in China, Chen et al. (2023) reported that ESG performance is positively interrelated with corporate performance. In contrast, Agnese et al. (2024) created an index of ESG and reported that ESG practices may either foster or hinder firm performance. Although there have been many empirical studies on the connection between environmental, social, and governance (ESG) variables and company profitability, there is an ongoing debate on the methodological soundness and consistency of the results. To account for firm-specific heterogeneity, panel data regression techniques are used in many studies (Friede, Busch, & Bassen, 2015; Fatemi, Glaum, & Kaiser, 2018), frequently using fixed or random effects models. Although this method reduces the bias caused by omitted variables, it leaves the possibility of endogeneity between business success and ESG engagement, raising questions about reverse causality. Although finding reliable instruments is still a major barrier, some studies have attempted to address this issue by utilising instrumental variables (IVs) or lagged ESG variables (Alareeni & Hamdan, 2020).

The inconsistent application of ESG indicators across studies is another issue. The comparability and replicability of results are compromised since different rating agencies use different techniques, which leads to different ESG rankings for the same firm (Berg, Koelbel, & Rigobon, 2022). Furthermore, many studies use combined ESG scores without breaking down distinct environmental, social, and governance elements. This obscures potentially counteracting effects, such as the fact that governance has a beneficial impact, whereas the environmental element has a negative correlation with profitability (Fernando, Sharfman, & Uysal 2017). Furthermore, the literature is dominated by research conducted in developed nations, with very few studies concentrating on emerging markets, where regulatory frameworks, investor demands, and ESG disclosure norms vary greatly (Ngwakwe, 2021). Generalizability is weakened by the absence of context-sensitive models, highlighting the need for more complex, sector- and region-specific research.

Although the research now in publication offers insightful information about the connection between ESG elements and firm profitability, the results are still conflicting and inconsistent. The disparate findings published in various jurisdictions and economic circumstances are the cause of this lack of consistency (Friede, Busch, & Bassen, 2015; Fatemi, Fooladi, & Tehranian, 2015). Differences in the availability of ESG data, which were limited and unstandardised until recently, may be partially responsible for the discrepancy. This led to a dependence on shorter or cross-sectional datasets and limited longitudinal studies (Eccles, Ioannou, & Serafeim, 2014). To address endogeneity and unobserved heterogeneity, most empirical studies have used panel data econometric techniques, including pooled ordinary least squares (OLS), fixed and random effects models, two-stage least squares (2SLS), and the generalised method of moments (GMM) (Velte, 2017; Alareeni & Hamdan, 2020).

One further aspect of the literature is the attempt to use disaggregated measures of ESG. As argued by Clément et al. (2025), the composite measures of ESG may prove unreliable when used to address various elements of ESG and evaluate their effects on financial or macroeconomic variables. Therefore, recent studies have emphasised disaggregating the total ESG measure into its major subcomponents. For example, Matemane et al. (2024) use a disaggregated measure in the South African context, and Narula et al. (2024) employ these measures in the context of India. Furthermore, aggregating firms at the country level has potential limitations and leads to a loss of industry-specific information. Studies in other jurisdictions have therefore focused on analysing ESG effects via industry groupings rather than country-specific methods (Haagensen et al., 2023, Ermakova et al., 2023). This approach, which is more robust, will be followed in this paper. In the following sections, we further review the empirical literature on ESG performance, firm performance and firm value, examining different aspects of performance and value.

Environment, Social and Governance (ESG)

ESG refers to a wide set of criteria including firms' environmental practices (such as emissions and waste management), social practices (such as workplace health and safety and human rights) and governance practices (such as board oversight and executive compensation) (Ahmad et al., 2023). ESG factors have gained significant attention in the investment and business world as criteria for evaluating the sustainability and ethical impact of organisations' operations (Erdogan et al., 2023). Organisations that focus on ESG factors demonstrate their commitment to responsible business practices and social impact alongside financial performance. Investors are increasingly incorporating ESG criteria into their decision-making processes to assess long-term risks and opportunities associated with environmental and social factors. By integrating ESG principles, organisations can strengthen reputation, attract investors who prioritise sustainability, mitigate risks, and build long-term resilience and growth (Chen at el., 2023). The adoption of ESG practices reflects a broader shift toward sustainable investing and corporate responsibility in creating value beyond financial profits. Furthermore,

ESG performance has become an important aspect of businesses' role in contributing to attaining the SDGs.

The impact of ESG performance on organisational performance and profitability

The impact of ESG performance on performance and profitability has been a topic of discussion in academia and business research for several years. Globally, several studies investigating the impact of ESG performance and profitability on organisations have shown that ESG inputs increase the short-term costs of an organisation but improve medium- and long-term performance (Friede, et al., 2015). Investments in ESG initiatives can require large sums of money, which can reduce the profits of an organisation. However, Cheng et al. (2023) state that investment in ESG can enhance the performance of an organisation by enabling businesses to maintain sustainability, establish a solid reputation, win the trust of stakeholders, and contribute to solving national sustainable development issues. In addition, ESGs enable organisations to improve their brand image, which attracts funding, lowers financing costs, and increases valuation.

ESG factors can significantly impact an organisation's ability to attract and retain skilled and experienced professionals, which in turn enhances their value and productivity (Krueger et al., 2020). Organisations that want to increase their profit margins must focus on attracting, keeping, and inspiring elite talent because their success in increasingly competitive marketplaces depends greatly on the innovation and productivity of these individuals. Turban and Greening (1997) performed a cross-sectional investigation at the business level and discovered a favourable correlation between an organisation's employee appeal and its ESG participation. The Sustainable Development Goals (SDGs), which emphasise sustainability and lower the carbon footprint through the integration of ESG activities into corporate operations, are another major motivator for many organisations. However, Masulis and Reza (2015) suggest that when management overinvests in ESG to serve their own goals, such as increasing individual reputation at the expense of shareholders, which can ultimately lower company profitability and value, then some ESG activities may be a manifestation of agency problems.

According to several studies conducted in recent decades, there is a positive relationship between environmental, social, and governance (ESG) and the financial performance of an

organisation (Friede et al., 2015). In fact, approximately 90% of these studies reported a positive correlation between the two variables. A meta-analysis by Alshehhi et al. (2018) also revealed a strong correlation between the sustainability and financial performance of an organisation. A more recent meta-analysis by Whelan et al. (2021) from Rockefeller Asset Management and the NYU Stern Center for Sustainable Business revealed that 58% of the papers analysed between 2015 and 2020 showed a positive relationship between ESG performance and financial performance. However, some studies have reported no significant relationship between ESG performance and financial performance. Atan et al. (2019) conducted a study to evaluate how ESG scores affect the profitability, firm value, and cost of capital of listed companies in Malaysia and reported no evidence of a relationship between the ESG score and firm value or profitability. Saygili et al. (2021) conducted a study on the effect of ESG performance on the financial performance of listed companies in Turkey from 2007--2017 and reported that reporting on the environment has a negative relationship with firm financial performance. ESG scores were found to have a mixed effect on the financial performance of Norwegian listed enterprises between 2010 and 2019 (Giannopoulos et al. 2022). The results revealed a positive correlation with firm value and a negative correlation with profitability.

ESG impact on share value and performance

ESG initiatives enhance the value of organisations in various aspects, such as value, dividends and performance, which have a positive effect on the performance of shares (Zumente and Bristova, 2021). Various recognised international organisations and governments undoubtably support the implementation of ESG initiatives by organisations, as it leads to sustainability. In addition, the United Nations Sustainable Stock Exchange Initiative (SSE), which works with exchanges to advance the sustainability agenda, confirms that 66 out of 120-member stock exchanges publish ESG reporting guidelines for organisations (SSE, 2022). Ionescu et al. (2019) found that among ESG dimensions, governance factors exert the strongest influence on the market value of firms in the travel and tourism industry, regardless of geographic region. This study provides insights into the influence of each ESG factor on the market value of companies, providing a useful tool for stakeholders to measure economic impact and for use as a predictor of economic performance (Ionescu, et al., 2019). In addition, the findings of Zumente and Bristova (2021) show that businesses with greater sustainability awareness ensure

shareholder value creation via improved financial performance and management quality as well as reduced risk metrics.

Yoon et al. (2018) posit that the influence of ESG performance on stock prices can be contingent upon business characteristics. CSR has less of a value-enhancing impact on businesses in environmentally sensitive industries than it does on businesses outside of these sectors. Notably, the value of environmentally conscious companies is adversely affected by corporate governance standards. Additionally, governance methods considerably improve market value, whereas investors do not attach considerable importance to governance practices carried out by other businesses (Yoon, et al., 2018). ESG as a strategic, early-adoption capability can enhance shareholder value, with markets rewarding proactive sustainability policies and value-creating CSR (Eccles et al., 2014) Another effect of ESG ratings for companies is that they provide extra-financial information, in addition to accounting measures, that can reveal how well a company is managing its risk. With the ever-increasing impact of media-generated news, both good and bad, reputation issues related to ESG can adversely affect a company's market share price or lead to the downfall of a seemingly strong company (Saygili et al.,2021). This implies that the reduction in risk associated with ESG cannot be ignored lightly and that its effects on shares are significantly considered by investors. Chininga et al. (2024) reported that environmental initiatives improve businesses' financial bottom line and market performance, whereas a business's social and governance practices have no effect on a business's accounting and market performance measures.

ESG and return on investment

The growing interest of investors and the heightened global awareness of non-financial risks, such as social responsibility, environmental issues, and proper governance, have placed pressure on organisations to prioritise these aspects of their businesses (Friede, et al., 2015). However, from the organisation's perspective, addressing ESG issues requires investments in terms of financial and resources, prompting the enquiry of whether the required investment and resources can bring returns to the organisation and investors (Chang, et al., 2023). Stakeholders expect organisations to consider environmental aspects, social responsibility, and governance issues in operations to increase their sustainability, which saves shareholders' investments in the long term. This is supported by stakeholder theory (1984), which posits that for organisations to be successful, they must bring into line the interests of all stakeholders;

therefore, they can be more sustainable and profitable. Yoon et al. (2018) state that organisations around the world are now voluntarily engaging in more ESG practices, which indicates that they may receive some return on investment from these activities. Aydoğmuş et al. (2022) reported that ESG performance has a positive and significant relationship with the return on investment in many organisations. In addition, Aydoğmuş et al. (2022) suggested that investing in high ESG performance promises financial returns for businesses in terms of both value and profitability. According to Aydoğmuş et al (2022), investing in high ESG performance promises financial return for the firm in terms of both value and profitability. However, Cornell (2021) posits that organisations with high ESG ratings can lower capital costs but can also lead to lower returns on investments.

ESG and dividends

Erdogan (2023) acknowledges that organisations with high ESG performance are likely to pay greater dividends and that those with controversies related to ESG issues are more likely to pay lower dividends. Organisations with better ESG performance generate more revenues and lower income volatility because ESG activities lead to more efficient management, better allocation of assets, better relations with stakeholders, reduced transaction costs, improved competitive advantage, and lower cash flow shocks during negative events, which results in more profit and dividend payouts (Whelan, et al., 2021). In addition, Matos et al. (2020) reported that the more sustainable an organisation is, the more stable its dividend payouts are. Dua and Sharma (2024), on the nexus between ESG and dividends, reported a positive relationship between ESG scores and the dividend pay ratio, indicating that organisations with higher ESG allocates more of their profits as dividends. In addition, greater ESG performance indicates better long-term alignment with shareholders and other stakeholders due to balanced stable profit sharing (Matos, et al., 2020). However, Zahid (2023) argues that high investments in ESG reduce shareholder dividend growth. Bilyay-Erdogan et.al (2023) concurred that investment related to ESG controversies have a negative effect on shareholder wealth, decreasing dividend payouts.

ESG and sustainability

The importance of sustainability for organisations cannot be overstated, as it serves as a strategic advantage in the business world. Effective management of ESG factors is increasingly recognised as vital for mitigating business risks and enhancing long-term resilience and continuity (Boiral, 2024). Stakeholders from all over the world have heightened their scrutiny of ESG issues and concerns. Therefore, Alshehhi et al. (2018) argue that adopting sustainable ESG-incorporated business practices can lead to cost savings, increased efficiency and effectiveness, and enhanced competitiveness for businesses. Whelan et al. (2021) postulated that it is essential for businesses to assess their vulnerability to climate-related risks and changing regulations and to accurately record and report their financial information for continued operations. In the same vein, Cheng et al. (2023) emphasise that ESG practices are crucial for aligning businesses with ethical practices, compliance with laws, participation in projects that bring about positive change, and supporting communities. Therefore, by implementing robust ESG practices, organisations can better manage their brands and reputation, ensure business continuity, and foster trust among shareholders and stakeholders. Furthermore, Matos et al. (2020) noted that ESG practices promote business sustainability by mitigating the risks associated with environmental disasters, social controversies, and governance failures.

3. Methodology

This section describes the approach taken to study the effects of environmental, social and governance (ESG) attributes, firm traits, and macroeconomic elements on the value and performance of a company for shareholders in relation to South African companies listed on the JSE. We define firm performance by return on equity (ROE) and market capitalisation by employing the logarithmic scale of share prices. The methodological approach is tailored to address the specific features of the South African market while obtaining consistent and reliable parameter estimates. Sections 3.1 describe all the relevant aspects of the data that were involved in the empirical analysis as well as the description and selection rationale of the variables and data sources, whereas sections 3.2 to 3.4 specify the statistical model to be employed, the associated diagnostic tests, and the log transformations. Thereafter, the panel regression models to be estimated and the related diagnostic tests are discussed later in this section. In this study, we employ both the fixed effects (FE) model to control for unobserved heterogeneity across

entities and the generalised method of moments (GMM) to address potential endogeneity in the explanatory variables, ensuring robust and consistent parameter estimates.

To address the econometric difficulties common in dynamic panel data models, this study uses the system generalised method of moments (System-GMM) estimator, which was first proposed by Arellano and Bover (1995) and then expanded upon by Blundell and Bond (1998). These challenges include autocorrelation in the error term, endogeneity of explanatory factors, and unobserved heterogeneity, all of which are typical in empirical research employing panel datasets at the business or national level. When a lagged dependent variable (i.e., dynamic specification) is present, traditional panel estimators such as fixed effects (FEs) or random effects (REs) become biassed and inconsistent, especially when the cross-sectional dimension (N) is large and the time dimension (T) is small (Nickell, 1981). Furthermore, an estimator that can account for simultaneity bias is required when dealing with endogeneity that results from omitted variables or reverse causation (Baltagi, 2008). By using internal tools, namely, lagged levels and differences in endogenous variables, system-GMM resolves these issues and enables reliable estimation even when endogenous regressors are present (Arellano & Bover, 1995; Blundell & Bond, 1998).

3.1. Data and Variable Selection

This research utilises annual firm-level performance data from ESG 74 JSE-listed companies covering the period from 2010--2022. This limitation arises from the lack of available ESG data for several JSE-listed companies. The data were obtained from Refinitiv, the South African Reserve Bank, and the World Bank. Given that some firms are missing data for earlier years of the sample period, our dataset is not fully balanced. This characteristic has been explicitly incorporated into our econometric framework to ensure that our findings are valid considering missing data. We measure firm performance via return on equity and use the logarithm of share prices to capture the market value of firms (shareholder value). In this study, we employ both the fixed effects (FE) model to control for unobserved heterogeneity across entities and the generalised method of moments (GMM) to address potential endogeneity in the explanatory variables, ensuring robust and consistent parameter estimates.

3.1.1. Variable Selection Rationale

The variables used in this study are listed in Table 1, with their associated symbols. The variables included in this study were selected on the basis of their theoretical and empirical relevance to firm performance and ESG research in emerging markets:

Table 1: Description of variables and sources

Variables	Description and source	Symbol
Dependent Variables		
Return on equity actual (ROE)	The realised percentage of profit earned by a company in relation to its shareholders' equity, indicating the efficiency of investment returns. This was selected as a comprehensive measure of profitability that specifically captures returns to shareholders, aligning with our research focus on shareholder value. Source: Refinitiv and Individual Company Financial Statements	ROE
Share price returns (Returns)	Closing share price at the end of the year. Measures firm value as determined by the market. Employed to measure market-determined firm value, reflecting investors' perceptions of firm performance and prospects.	Returns
Independent Variables		
Social pillar score (SPS)	A metric quantifying societal well-being and cohesion within a community or nation, often assessing factors like education, healthcare, and social equality. The SPS quantifies societal well-being initiatives, particularly relevant in the South African context with its unique social challenges and transformation agenda. Source: Refinitiv	sps
Governance pillar score (GPS)	A measure assessing the effectiveness and transparency of organisational management practices, often used in evaluations or rankings. The GPS measures the effectiveness and transparency of organisational management practices, critical in an emerging market with evolving corporate governance standards. Source: Refinitiv	gps
Emission score (ES)	Quantifies pollutants released by a source, aiding in environmental impact assessment and regulation compliance. The ES captures performance relating to emissions, a growing concern for JSE-listed companies facing stricter environmental policies. Top of Form Source: Refinitiv	es
CSR strategy score (CSRS)	quantifies a company's performance in implementing corporate social responsibility initiatives, reflecting its commitment to societal and environmental concerns. The CSRS captures a company’s strategic approach towards corporate social responsibility, especially within the context of South Africa's developmental framework. Top of Form Source: Refinitiv	Csrs

ESG combined score (ESGTS)	Aggregates Environmental, Social, and Governance metrics into a single measure, reflecting a company's sustainability and ethical performance. It assesses the degree of performance in all ESG aspects, providing complete evaluation. Source: Refinitiv	esgts
Total company debt (DEBT)	The cumulative amount of money owed by an organisation encompasses all outstanding loans and financial obligations. Total company debt was included as a specific characteristic to control for factors that might influence the performance of the firms. Source: Refinitiv	DEBT
Economic growth (ECGROWTH)	Measures the annual change in GDP. This controls for broader economic conditions impacting all firms within the sample.	ecgrowth
Inflation (INFL)	A sustained increase in the general price level of goods and services within an economy, eroding purchasing power over time. This controls for broader economic conditions impacting all firms within the sample. Source = World bank	Infl
Exchange rate (EXC)	The value of one currency in terms of another, determining international trade competitiveness and investment returns. We use the ZAR/USD exchange rate. This controls for broader economic conditions impacting all firms within the sample. Source = SARB	Exc
Total firm assets (ASSETS)	Average value of the total assets of the firm. Calculated as percentage of GDP. Total firm assets was included as a specific characteristic to control for factors that might influence the performance of the firms. Source: Refinitiv	assets

3.2 Data Transformation and Model Specification

3.2.1. Natural log transformation

For all variables that were not in percentage form, natural log transformation was performed. The log transformation of variables is important for allowing the coefficient values to be interpreted as elasticities, which helps us analyse the percentage changes between the two variables. Log transformations of data are important, as they decrease the heteroscedasticity in the datasets and minimise the impact on outliers (Greene 2018; Hill, et al. 2018).

3.2.2 Economic Model Specification

The ESG-performance relationship is analysed via two robust approaches. First, a fixed effects (FE) estimator is applied to mitigate time-invariant unobserved heterogeneity at the firm level to avoid omitted variable bias due to persistent characteristics (Angrist & Pischke, 2009; Hsiao, 2014). Second,

the analytical work is carried out via the dynamic system-generalised method of moments (Arellano and Bond 1991), which Blundell and Bond (1998) extended. The generalised method of moments model is preferred because of the technique's ability to provide consistent and efficient parameters while using instruments to address the problem of endogeneity. Dynamic panel analysis generalises the method of the moments model and allows for the analysis of dynamic relationships by incorporating lagged values of variables. This is particularly important, as the variables that are used in this study are likely to have lagged effects on return on equity. Since our study is based on a combined dataset of cross-firm and time series observations, the impacts of ESG performance, firm performance, and shareholder value on the return on equity are estimated via the two-step system GMM model estimator. Second, economic and financial variables are dynamic in nature, and dynamic panel models can capture their behaviour.

As a result, the system GMM model is suitable for determining this dynamic phenomenon. The GMM system can address the endogeneity problem by using instrumental variables. An endogeneity problem arises when there is a bidirectional relationship between variables, meaning that return on equity could be affected by ESG, firms' performance, and shareholders' value, and vice versa. By selecting appropriate instruments that are correlated with the independent variables but not with the error term, the GMM system helps our study control for endogeneity. Another reason why the GMM system was used in the current study is the number of problems when examining the impact of ESG, firms' performance, and shareholders' value on return on equity, including unobserved heterogeneity and autocorrelation, which cannot be solved by fixed effects.

Our empirical approach offers several key methodological strengths that increase the robustness of our findings. Potential omitted variable bias from enduring firm characteristics is eliminated by the fixed effects (FE) estimator, which efficiently absorbs all time-invariant unobserved heterogeneity through within-firm transformation. By using both levels and differenced equations at the same time, the system GMM estimator improves efficiency gains over difference GMM, which further solidifies our study (Blundell & Bond, 1998).

The system GMM is suitable for datasets with a small-time component (T) and a large panel dimension. Our time series length is 13 years, covering the years 2010--2022, whereas our panels (N) cover 74 companies. The GMM offers accurate estimations by utilising the moment conditions present in the data. This improves the accuracy and reliability of the

estimated coefficients, hence improving the correctness of the outcomes. By using this dynamic model, GMM, we were able to perform crucial robustness checks on the statistical inferences and obtain precise estimates. Therefore, on the basis of the GMM model's robustness, the empirical associations among ESG performance, firm performance, shareholder value, and return on equity are presented in Equation (1) in Section 3.2.

3.2. Model Specification

The dynamic panel model specification is represented as follows:

$$ROE_{i,j,t} = \alpha_i + \beta_k ROE_{i,t-1} + \beta_1 X^1_{j,t} + \beta_2 X^2_{j,t} + \beta_3 X^3_{j,t} + \sum_{M=1}^{M} \beta_m X^m_{k,t} + \varepsilon_{i,t} \qquad (1)$$

where:

$ROE_{i,j,t}$ represents the return on equity for firm i in industry j at time t

α_i captures firm-specific fixed effects

$ROE_{i,t-1}$ is the lagged dependent variable accounting for persistence in firm performance

$X^1_{j,t}, X^2_{j,t}, X^3_{j,t}$ represents our ESG variables of interest, including the ESG combined score, social pillar score, CSR strategy score, emission score, and governance pillar score.

$X^m_{k,t}$ represents control variables, including the exchange rate, inflation, GDP growth, total debt, and total assets.

$\varepsilon_{i,t}$ is the error term

3.4. Diagnostic Test

To maintain the robustness and validity of our system GMM estimates, it is important to follow a comprehensive set of diagnostic tests and robustness checks grounded in the literature. The first procedure is the Sargan–Hansen test of overidentifying restrictions, which checks instrument validity; that is, not rejecting the null hypothesis supports instrument exogeneity (Baum et al. 2003; Roodman, 2009). Second, we conduct the Arellano–Bond test for serial correlation, which in our case, model misspecification would be indicated by second-order autocorrelation of differenced residuals (Arellano & Bond, 1991). Third, to allow for possible industry heterogeneity, we estimate models for six major industry groupings—financial

services, real estate, manufacturing, retail, food and beverages, and healthcare—to assess the stability of our parameter estimates.

Our robustness checks include three additional validation approaches: (1) inclusion of pooled OLS, fixed effects, and random effects models to test the consistency of model assumptions for structural breaks; (2) analysis of lag lengths to test the dependence of results on arbitrary selection of lag length; and (3) partitioning data into distinct temporal periods and industry clusters to analyse potential shifts in the ESG–performance relationship.

This system of verifying data uses multiple techniques simultaneously and addresses major issues related to the precision of parameters from dynamic panel data models in sustainability contexts (Flannery & Hankins, 2013).

Key methodological safeguards:

1. Testing the validity of instruments through overidentifying restrictions.
2. Overlapping data sequence analysis for identifying missing specification problems.
3. Inter-validation analysis within distinct industry domains with unique economic traits.
4. Comparison of three models selected to evaluate sensitivity to estimator change.
5. Horizontal and vertical checking for consistency across time and units.

Following this protocol allowed us to affirm that our results were not due to the specific model structure or inherent sample attributes. The credibility of our conclusions on the relationship between ESG criteria and performance in emerging economies is considerably strengthened. This approach particularly addresses concerns about the quality of ESG measures and the likelihood of omitted variable bias in sustainability work (Albuquerque et al, 2020).

4. Data Analysis and Discussion

This section reports the results of the data analysis. We present descriptive statistics in Section 4.1 and our main estimated results in Section 4.2 together with the diagnostic tests for the reported results.

4.1 Descriptive Statistics

Table 2 below shows the univariate characteristics of the variables used in the estimated model. The total number of observations, which is 967, indicates that the data are unbalanced and that some of the observations were removed. The range of the data does not point to large disparities or outliers in the different variables' data. However, all the variables appear to be not normally

distributed, as shown by statistically significant values of the Jarque–Bera statistics. This is supported by the deviant values reported for both skewness and kurtosis in the table. While these characteristics provide an important window into understanding the data used in the study, they do not impose a limit to our further analysis of the data. Therefore, in the next section, we provide a graphical view of the correlations among the variables used in the study via both a correlation matrix and scatter plots of various variables.

Table 2: Descriptive Statistics

	ROE	RETURNS	ASSETS	DEBT	EC GROWTH	ESGTS	ES	SPS	GPS	CSRS	INFL1	NPL_	EXC_US
Mean	0.17	0.58	3.44	21.56	1.41	48.28	47.64	51.36	50.70	51.32	0.05	3.95	12.13
Median	0.16	0.62	0.55	17.69	1.56	50.88	50.74	53.74	51.78	58.80	0.05	3.89	13.09
Maximum	1.32	2.85	71.67	139.51	4.70	88.60	98.81	96.48	97.46	99.60	0.07	5.79	17.35
Minimum	-1.36	-2.23	0.00	0.00	-5.96	0.00	0.00	0.00	0.00	0.00	0.03	2.84	6.76
Std. Dev.	0.17	0.75	8.74	18.89	2.32	19.44	26.79	22.59	23.99	30.20	0.01	0.86	3.18
Skewness	-0.40	-0.37	4.13	1.29	-2.02	-0.66	-0.28	-0.53	-0.28	-0.16	-0.17	0.52	-0.21
Kurtosis	19.85	4.43	22.74	5.66	7.59	3.29	2.18	2.89	2.33	1.81	2.52	2.42	1.92
Jarque-Bera	10404.05	94.66	16732.79	503.86	1366.37	67.68	36.27	41.36	28.37	55.96	12.35	51.43	49.02
Probability	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sum	153.35	508.71	3019.19	18905.28	1236.28	42342.87	41779.83	45042.79	44461.18	45011.25	46.10	3466.43	10641.43
Sum Sq. Dev.	25.4	493.5	66893.2	312462.6	4706.2	331165.4	628812.7	446984.6	504035.4	798700.8	0.1	645.2	8872.9
Observations	877.00	877.00	877.00	877.00	877.00	877.00	877.00	877.00	877.00	877.00	877.00	877.00	877.00
Panels	74	74	74	74	74	74	74	74	74	74	74	74	74

Source: Authors' own construct

4.2 Correlation Matrix

Table 3 presents our preliminary analysis of the data via correlation analysis. Our analysis focuses mainly on the correlation between our measures of firm profitability and ESG variables. Surprisingly, all ESG variables have a negative correlation with return on equity. For instance, the correlation between return on equity and GPS is –0.02, and the correlation between ROE and CSRS is -0.07, which shows that the individual components of the ESG score move indirectly together with a company's profit. In contrast, all the measures of ESG performance are found to be positively correlated with stock market returns. This implies that investors associate better ESG scores with company performance. Furthermore, the correlation between the total ESG score (ESGTS) and ROE is also negative. ESG therefore portrays a negative correlational relationship with firm profitability. All other control variables also positively correlate with company profits except for company debt, which is expected from the literature, where company debt may reduce profits due to increased debt repayments. Growth in the economy, as represented by GDP, has a positive relationship with both return on equity and stock market returns, implying that firms that thrive contribute to growing the economy. This may be due to growing markets and demand for firm products deriving from increased consumption, especially during times of good economic performance.

Table 3: Correlation matrix

	ROE	RETURNS	ASSETS	DEBT	EC GROWTH	ESGTS	ES	SPS	GPS	CSRS	INFL1	NPL_
ROE	1											
RETURNS	0.20	1.00										
ASSETS	-0.07	0.12	1.00									
DEBT2	-0.08	-0.17	-0.26	1.00								
ECGROWTH	0.14	0.04	-0.03	-0.07	1.00							
ESGTS	-0.02	0.25	0.20	-0.05	-0.15	1.00						
ES	-0.03	0.21	0.25	-0.11	-0.11	0.76	1.00					
SPS	-0.04	0.29	0.30	-0.04	-0.16	0.89	0.71	1.00				
GPS	-0.02	0.10	-0.04	0.02	-0.09	0.73	0.37	0.47	1.00			
CSRS	-0.07	0.25	0.30	-0.13	-0.11	0.67	0.62	0.66	0.46	1.00		
INFL1	0.07	0.04	0.00	-0.04	0.44	0.07	0.04	0.04	0.10	0.05	1.00	
NPL_	0.07	0.01	0.00	-0.03	-0.06	-0.20	-0.12	-0.16	-0.23	-0.18	-0.51	1.00
EXC_US	-0.15	-0.12	0.02	0.13	-0.57	0.34	0.30	0.38	0.17	0.22	-0.06	-0.16

Source: Authors' own construct

4.3 Estimation results

In this section, we present the panel estimation results. Our results are divided into two groups. First, we analyse the impacts of ESG performance, firm-specific characteristics and macroeconomic influences on firm profitability via disaggregated data for different industries. Second, we estimate two regressions via aggregated data. In this approach, we further decompose the ESG measure into four categories: the environmental score (ES), the governance score (GPS), the SPS and the CSRS. Note that other measures of ESG performance were left out due to insufficient data for most of the firms considered in the study. The second set of regression results analyses the impact of ESG performance, firm-specific characteristics and macroeconomic influences on firm value using stock market returns as our dependent variable.

Disaggregated Results

In Table 4, we present the results from our static models, which are obtained from disaggregated industry data. These results reveal a more heterogeneous impact of ESG performance on the profitability of different industries. Unlike our predecessors (Matemane et al., 2024 and Masongweni and Simo-Kengne, 2024), disaggregating the data per industry helps us distinguish the impact of ESG factors on profitability in different industries. This approach aligns with the prevailing literature on ESEs, which has established heterogeneous sets of results across industries. For our purposes, we merge related industries, as shown in Table 4. For example, mining, construction and manufacturing (MCManu) make up one industry group.

For an industry-by-industry analysis, the coefficients of the total ESG score are positive for all other industries except for the financial industry. While these coefficients are positive and statistically insignificant for real estate, manufacturing and health and pharmaceuticals, the positive signs are significant for the retail and food sectors. These findings are in line with the findings of Özer, Aktaş, and Çam (2023), who reported a positive relationship between the ESG scores of non-financial firms and their business performance. This is plausible, as it has become increasingly important for investors in the real estate, manufacturing, retail, food, and health sectors to consider sustainability. It is becoming increasingly apparent that these sectors can contribute significantly to society by rehabilitating public spaces; creating affordable, social, and care housing; and investing in new constructions with an environmental focus such as green buildings (World Green Building Council, 2023; Institute for Human Rights and Business, 2024).

In columns 1 and 2 of Table 4, we estimate the financial sector's panel OLS and fixed effects models. We find a negative and significant relationship between return on equity and total ESG performance. This finding is supported by Koundouri et al. (2022), who reported that ESG leaders in industries that historically had low financial returns presented lower negative ROE than their counterparts did. This suggests that while improved ESG initiatives may occasionally lessen adverse financial consequences, they do not always have a positive correlation with financial returns. However, Ponce and Wibowo's (2023) study revealed a persistent negative correlation between ESG efforts and financial performance indicators, such as ROE, while acknowledging that the outcomes of each ESG pillar can vary.

Table 4: Estimation results for disaggregated data

	Financial Corp	**Financial Corp**	**Real Estate**	**MCManu**	**Retail&Serv**	**Food&Bev**	**Health&Pharma**
Dependent variable	ROE	ROE	ROE	ROE	ROE	ROE	ROE
ESGTS	-0.0008*** (0.001)	-0.0009** (0.027)	0.0002 (0.333)	0.0001 (0.626)	0.0015*** (0.005)	0.7495*** (0.000)	0.0002 (0.853)
ECGROWTH	0.4372*** (0.000)	0.4740*** (0.000)	-0.0040 (0.099)	0.0018*** (0.001)	0.0050* (0.088)	0.4830** (0.043)	-0.0020** (0.047)
DEBT	-0.0423** (0.016)	-0.0628 (0.162)	0.0005** (0.030)	-0.0016*** (0.008)	-0.0003 (0.572)	-0.1190 (0.381)	-0.0006 (0.127)
EXC_US	-0.0271 (0.699)	-0.0035 (0.957)	-0.0126*** (0.000)	-0.0066*** (0.000)	-0.0049** (0.022)	-0.8853*** (0.000)	-0.0206*** (0.000)
INFL	0.4889* (0.055)	0.5392** (0.028)	0.6057 (0.194)	0.0078*** (0.000)	0.0422 (0.880)	-0.9246*** (0.000)	1.0562** (0.012)
ASSETS	-0.0919*** (0.001)	-0.0385 (0.242)	0.0583* (0.013)	-0.0002 (0.970)	0.0269** (0.027)	1.6724*** (0.000)	0.0446*** (0.002)
ASSETS (-1)					-0.0429** (0.010)	-1.3502*** (0.000)	
NPL_	-0.8716*** (0.003)	-0.7566*** (0.003)	-0.0164* (0.052)	0.0116*** (0.000)	0.0210*** (0.000)	0.7495*** (0.000)	0.0018 (0.748)
C	21.796*** (0.000)	21.0432*** (0.000)	0.2321*** (0.000)	0.1256*** (0.000)	0.1341 (0.000)		0.4205 (1.615)
Method	POLS[r]	FE[r]	FE[r]	FE[r]	FE[r]	FMOLS	FE[r]
Observations	200	200	130	271	216	60	52
Cross sections	16	16	10	21	18	5	4
Cointegration	n/a	n/a	n/a	n/a	n/a	YES[k]	n/a

***, ** and * represent 1%, 5% and 10% significance, respectively. FE[r] denotes the use of robust standard errors for fixed effects regression models. Financial corporations include banks, investment companies and insurance companies; MCManu is short for mining, construction and manufacturing; Retail&Serv includes service companies and retailers; and Food&Bev represents the food and beverages industry. The [k]Kao ADF statistic is -1.63 (Prob. 0.050).

Source: Authors' own construct

Aggregated data results

In this section, we analyse the impact of ESG performance on returns on equity and share returns via aggregated data (for all industries), but we disaggregate the measures of ESG performance. We employ the GMM technique with the full sample of 74 companies. In models 1, 3, and 5, as indicated in Table 5, returns were used as the dependent variable, whereas ROE was used as the dependent variable in models 2 and 4.

Table 5: System dynamic panel-data estimation (Aggregated data)

	(2) ROE	(4) ROE	(1) returns	(3) returns	(5) Returns
L.returns			1.195***	1.059***	0.956***
			(.151)	(0.048)	(0.053)
L2. returns				-0.053	
				(0.05)	
L.ROE	0.471***	0.498***			
	(0.078)	(0.084)			
L2.ROE		0.128**			
		(0.065)			
Esgts		0.017		0.000	
		(0.093)		(0.001)	
Sps	0.135**		0.003		-0.001
	(0.065)		(0.004)		(0.001)
Gps	0.025		0.003		0.001*
	(0.038)		(0.002)		(0.001)
Es	-0.102*		-0.003		0.000
	(0.055)		(0.003)		(0.001)
Csrs	0.023		-0.004*		-0.001*
	(0.052)		0(.002)		(0.001)
Exc	0.436	(0.093)	-0.016*	(0.001)	-0.008**
	(5.009)	-0.421*	(0.008)	0.024	(0.004)
Ecgrowth	-6.354	-0.523*	0.242**	-0.031**	0.108**
	(99.664)	(0.269)	(0.106)	(0.013)	(0.05)
Debt	0.015	0.027	-0.011**	-0.001*	-0.002*
	(0.052)	(0.046)	(0.005)	(0.001)	(0.001)
Assets	-0.002	-0.002	0	0	0
	(0.002)	(0.002)	(0)	(0)	(0)
Infl		0.247		-0.035	
		(.514)		(.032)	
npl_	5.821			-0.371	0.117
	(74.489)			(0.391)	(0.076)
yr2013	5.88	-0.841	0.095	-0.133	
	(90.188)	(0.995)	(0.302)	(0.200)	
yr2014	4.926	-1.137	-1.409***	-0.533	-0.056
	(38.435)	(0.954)	(0.481)	(0.389)	(0.053)
yr2015	5.573	1.081	0.615***	-0.347	0.267***
	(47.425)	(1.48)	(0.229)	(0.509)	(0.055)
yr2016	2.229	-1.598	0.77***	-0.518	0.265***
	(24.751)	(1.6)	(0.228)	(0.625)	(0.08)

yr2017	3.037	-0.421	0.041	-0.741	0.102**
	(30.069)	(1.119)	(0.124)	(0.64)	(0.047)
yr2018	1.491	1.542	0.103	-0.312	0.024
	(3.122)	(1.452)	(0.278)	(0.305)	(0.062)
yr2019	-11.209	-2.073	0.967**	-0.405	0.064
	(130.709)	(1.939)	(0.424)	(.303)	(0.142)
yr2020	-51.664		1.592		0.762
	(810.973)		(.991)		(0.541)
yr2021	15.002		-.928***		-0.423***
	(272.764)		(.294)		(0.083)
yr2022					-0.122
					(0.12)
_cons	-41.261	11.967*	0.983*	1.561	0.062
	(525.249)	(6.408)	(.543)	(1.608)	(0.186)
Observations	888	814	887	813	887
Pseudo R^2	. z	. z	. z	. z	. z
Serial Correlation Order 1	-4.061 [0.000]	-4.2378 [0.000]	-3.259 [0.001]	-4.415 [0.000]	4.0873 [0.000]
Serial Correlation Order 2	0.5968 [0.551]	-1.0250 [0.305]	-1.3969 [0.162]	-1.4869 [0.137]	-.75059 [0.452]
Sargan	23.1538 [0.568]	4.6044 [0.969]	6.3631 [0.606]	32.4587 [0.256]	N/A

Numbers in parentheses () represent standard errors and numbers in parentheses [] represents p values. ***, ** and * represents 1%, 5% and 10% statistical significance, respectively. All estimated Models use Windmeijer (2005) cluster robust standard errors.

Source: Authors' Own Construct

We use the Sargan test (Test of Overidentifying Restrictions) to assess the validity of the instruments used in the GMM estimation. In dynamic panel data models, instruments are used to address endogeneity issues. The null hypothesis is that the instruments are valid (i.e., uncorrelated with the error term). The p values are 0.568, 0.969, 0.606, and 0.256, which are greater than 0.05, suggesting that the instruments are valid and that there are no potential problems with instrument validity (overidentification issues).

Arrellano-Bond checks for serial correlation in the errors. Order 1 checks the first-order serial correlation in the differenced errors, which is expected. However, the order 2 test examines whether there is a second-order serial correlation, which should not exist in a well-specified model. The p values for order 2 are 0.551, 0.305, 0.162, 0.137, and 0.452, which are all greater than 0.05, which suggests that the model is free from second-order serial correlation, which is desirable.

The coefficient of the lagged dependent variable indicates the degree of persistence. The coefficients of lagged returns are 1.195, 1.059, and 0.956, which are all close to 1, suggesting that past values strongly influence current values. The result for lagged ROE is close to 0, implying less persistence. The social pillar score has a positive coefficient of 0.135 at the 99% confidence interval. A positive coefficient indicates a positive relationship, meaning that as the social pillar

score variable increases, the dependent variable return on investment tends to increase. This is plausible, as studies have shown that a person's educational level influences their ability to access finance (Mhlanga et al., 2021). Furthermore, the ESG combined score has a positive coefficient of 0.17 and an inflation positive coefficient of 0.247, implying that an increase in the ESG combined score and inflation increases the return on investment; however, inflation has a negative coefficient of -0.35, with share returns indicating that an increase in inflation reduces share returns. As noted earlier, increasing share performance, attracting investors, and improving relations with stakeholders can all be influenced by ESG practices (Dua & Sharma, 2024). The governance pillar score has a coefficient of 0.25 for ROE and 0.03 for share returns, indicating a positive relationship; therefore, an increase in the governance pillar score increases both share returns and ROE. The findings are similar to those of Özer, Aktaş, and Çam (2023), who reported a positive relationship between business performance and ESG subcomponents, such as the social and governance dimensions, although this relationship was not statistically significant.

The emission score has negative coefficients on ROE and share returns of -1.02 and -0.03, respectively, implying that an increase in emission scores decreases both ROE and share returns. This is plausible, as banks are faced with a trade-off to either lend money to firms for profit or consider how such firms are ESG compliant. In this context, banks and investors incorporate environmental risks when lending or investing; firms with poor environmental performance face higher financing costs (Chava, 2014). The CSR strategy score has a positive coefficient on ROE of 0.23 and a negative coefficient on share returns of -0.04, implying that an increase in the CSR strategy score increases ROE and decreases share returns. The exchange rate has a positive coefficient on ROE of 0.436 and a negative coefficient on share returns of -0.16, implying that an increase in the exchange rate increases ROE and decreases share returns. Economic growth has a negative coefficient on ROE of -6,354 and a positive coefficient on share returns of 0.242. An increase in economic growth decreases ROE and increases share returns. Debt has a positive coefficient on ROE and a negative coefficient on share returns, and assets have a negative coefficient on ROE.

ESG increases the return on investment and share returns, which includes other components, such as the governance pillar, the CSR strategy score, and the social pillar. The emissions score is the only score with a negative effect, which is likely caused by the substantial investment required to reduce emissions. Our findings are consistent with those of Farma

(2021), who states that ESG initiatives add value to organisations and investors who value ESG-performing businesses, leading to higher stock prices. Similarly, Aydogmus et al. (2022) reported that ESG performance has a positive relationship with returns on investment. ESG information can provide investors and analysts with insight into a company's long-term environmental performance.

Banks and insurers must incorporate ESG risk, such as social unrest and climate change, into their credit risk, underwriting, and asset-liability management in a market with unstable macroeconomic conditions such as South Africa. Since ESG performance has a negative effect on ROE in banks, policy authorities may need to ensure that ESG compliance does not unnecessarily penalise financial performance, particularly when adoption is needed. Greater ESG accountability is being pushed for by the Financial Sector Conduct Authority (FSCA) and the South African Reserve Bank (SARB), although there is a risk of token compliance or greenwashing if compliance has a detrimental effect on profitability. To prevent sincere efforts from being discouraged, regulators can think about implementing ESG gradually or offering incentives (such capital relief for green loans). Managers must incorporate significant ESG considerations into risk and performance frameworks. Furthermore, in the case of emerging markets, creating localised ESG measures may improve financial relevance and strategic alignment.

In line with both legitimacy and stakeholder theories, our findings demonstrate a complex and nuanced relationship between ESG criteria and firm profitability. Using industry-specific data, we find mixed results, highlighting the significance of context in evaluating sustainability initiatives. For instance, while ESG performance negatively influences profitability in financial corporations, it positively influences profitability in all other industries. This finding supports the idea that sector-specific and institutional dynamics shape ESG drivers rather than acting independently. Our study offers investors and corporate decision-makers helpful advice for formulating strategies that are sensitive to regional difficulties and international expectations and that are informed by the identification of sector patterns and varying impacts across different ESG components. Given the distinct socioeconomic realities of South Africa and comparable economies, these implications highlight the necessity of flexible ESG frameworks and policy alignment.

5. Conclusion

This study investigates and analyses the impact of environmental, social and governance (ESG) factors on firm performance for companies listed on the JSE in South Africa from 2010--2022. We focused on the principle that the role of a financial manager is to increase shareholder wealth and whether ESG spending might reduce returns to shareholders. The relationships between environmental, social, and governance (ESG) activity and return on equity were examined via data from 74 listed firms on the JSE. First, we observed considerable variation by industry. The financial institutions displayed a negative ESG-ROE relationship, which is consistent with the findings of Saygili et al. (2021), who noted the trade-off between the banking sector's sustainability and profits. In contrast, non-financial sectors exhibited a positive association, which is in line with the findings of Özer et al. (2023) for emerging markets. Second, using aggregated data, the study revealed that different ESG factors influence returns on equity and share returns differently. For example, the social and governance pillars have positive performance associations, whereas the environmental dimension, particularly emission scores, indicates short-term financial trade-offs, suggesting unequal cost–benefit ratios of sustainability across various domains. Considering ESG risk as part of a firm's decisions is one of the most important factors for sustainable development. Firms' ESG practices reflect their attention to the environment, how they contribute to society, and how they run and govern their organisations. ESG factors, especially those related to social and environmental dimensions, play a crucial role in improving firms' sustainability practices. Hence, firms must prioritise these factors in their business decisions. Our findings support stakeholder theory by providing positive social and governance performance relationships in non-financial sectors. As noted earlier by Yoon et al. (2018), engaging in ESG practices tends to increase organisations' return on investment. Furthermore, we widen the scope of the sustainability trade-off debate by showing for the first time that environmental investments, especially emission reductions, impose short-term financial costs, suggesting the temporal separation of sustainability efforts from financial returns.

Author Contributions Statement

Shame Mugova the corresponding author conceptualised of the research idea, the background, contributed to literature review, analysis and interpretation of findings and conclusion. The co-authors Reward Utete contributed to literature review, Sheunesu Zhou contributed to the data analysis, methodology and literature review Mthuthuzeli Qwabe contributed to the methodology and data coding; Kehinde Ilesanmi contributed to the data analysis and discussion of the results and conclusions.

Data availability statement

The data that support the findings of this study are available from the corresponding author, [S.M.,] upon reasonable request.

Disclosure of interest

The authors report that there are no competing interests to declare.

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