AN INVESTIGATION INTO THE ROLE OF ESG PILLARS ON FIRM FINANCIAL PERFORMANCE IN SOUTH AFRICA

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ABSTRACT

South Africa is encouraging firms to be more ethical, transparent and environmentally conscious to improve their financial performance. Studies establishing the relationship between Environmental, Social and Governance (ESG) and firm performance in South Africa have relied on generalised linear estimations which overlook the heterogeneous effects that ESG factors can have across firm performance over time. To address this, the study investigates ESG disclosure's non-linear impact on Johannesburg Stock Exchange (JSE) firms' financial performance in addition to the traditional linear models. Using Fixed, Random, and Panel Quantile Regression, it examines the influence of overall ESG scores and the individual pillars: Environment (ENV), Social (SOC) and Governance (GOV), on firm performance, measured by Tobin's Q (TQ), Market Capitalisation (MCAP), and Return on Equity (ROE). The analysis uncovers how ESG impacts vary across low-, middle-, and high-performing firms. Data for 28 JSE-listed companies were obtained from the LSEG Refinitiv database, covering the period from 2012 to 2023, comprising 336 observations. The results reveal the following: (i) For linear models, the combined ESG score tends to negatively affect market-based performance measures (TQ and MCAP). (ii) For accounting-based performance (ROE), both the combined ESG score and the ENV pillar have positive and significant effects, while the SOC and GOV pillars show no significant impact. (iii) For quantile regression, the combined ESG score has a positive and significant influence on the three performance measures across most levels of the distribution. The SOC pillar demonstrates significant positive effects across all measures and quantiles. The ENV pillar has a strong positive effect on both TQ and ROE and a modest positive impact on MCAP in the upper quantiles. The GOV pillar demonstrated evident effects only on ROE and mostly within the lower-to-middle quantiles. ESG factors have a varied impact on firm performance in South Africa. Environmental, governance and social initiatives enhance performance by improving corporate reputation and stakeholder trust, particularly for firms with lower market performance. Thus, the study recommends that firms falling in the lower half of the performance distribution, should prioritise socially driven ESG initiatives to enhance stakeholder relations. Regulators and policymakers should harmonise ESG disclosure and incentivise ESG integration to ensure these are recognised and rewarded by financial markets.

Keywords: ESG, Fixed and Random Effects, Quantile Regression, Firm Performance, Accounting – and market–based measures, Tobin's Q, Market Capitalisation, Returns on Equity

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CHAPTER ONE

1.1. Introduction

1.2. Background/Context of Research

Environmental, Social, and Governance (ESG) investing has grown in relevance and importance globally, reflecting a shift in how companies and investors consider long-term sustainability with financial performance. Originally from the broader concept of Corporate Social Responsibility (CSR), ESG is now a distinct, data-driven framework guiding investment and corporate behaviour. ESG has evolved into a crucial component of risk management and long-term value creation in response to growing concerns over climate change, corporate governance, and social inequality (Dziawgo, 2019:26).

CSR finds its roots in religious movements dating back to the 18th and 19th centuries, advocating for ethical investments that aligned with moral values (Dube, 2020:11). The CSR framework formally emerged in the middle of the 20th century as a response to increasing public demand for corporate accountability (Dziawgo, 2019:26). The concept of CSR is broadly about businesses contributing positively to society and minimizing its negative impacts, focusing on areas such as community engagement, environmental stewardship, and the welfare of its employees (Baskin, 2006:35). However, CSR lacked standardized frameworks, making it challenging for investors to quantify the social and environmental impact of companies effectively, paving the way for ESG investing (Amin and Tauseef, 2022:5; Marais, Van der Lugt and Mans-Kemp, 2022:3).

In contrast to Corporate Social Responsibility, ESG provides a more structured approach by explicitly integrating Environmental, Social, and Governance factors into investment decisions, enabling investors to assess non-financial risks and opportunities with greater accuracy (Eccles and Sarafeim, 2013:3; UNPRI, 2013:5). ESG marks a shift from the exclusionary investment practices of early Socially Responsible Investing (SRI), which primarily focused on avoiding investments in "sin" industries like tobacco or weapons, towards a more proactive strategy that seeks rewards from investing in firms committed to establishing and maintaining sustainable practices (Dalal and Thaker, 2019:5; Jarvenin, 2022:18).

Globally, the rise of ESG can be largely attributed to an increasing awareness of climate risks, regulatory changes, and evolving societal expectations. The World Summit on Sustainable Development held in Johannesburg (2002), the UN-backed Principles for Responsible Investment (PRI) launched in 2006, and the UN Convention on Climate Change held in Durban (2011) are examples of initiatives that have driven the awareness and adoption of sustainable investment. Other significant international agreements such as the Paris Agreement and the United Nations' Sustainable Development Goals (SDGs) of 2015 have also promoted the integration of ESG factors into mainstream investment approaches. Investors now appreciate the material impact of ESG factors, noting that companies managing ESG risks effectively outperform their counterparts in terms of long-term financial gains (Franzen, 2019:17).

South Africa's unique socio-political landscape, shaped by its pre - and post-apartheid history, has made ESG particularly relevant. Since 1994, South Africa has pursued sustainable development through initiatives like the first King Report on Corporate Governance (1994) and the Reconstruction and Development Programme (1996), addressing both corporate governance and socio-economic challenges[1]. Additionally, the rise of ESG investing in South Africa has been further spurred by local developments in legislation, regulations, and codes of conduct such as the publication of subsequent editions of the King Report (2002; 2009; 2016), the Promulgation of the B-BBEE Act (No.53 of 2003), and the CRISA I and II (2011; 2022). South Africa was also among the first nations globally to have its Stock Exchange (JSE) introduce mandatory integrated reporting for listed companies, requiring them to disclose non-financial information, such as ESG metrics, as per the recommendations of the King Code of Governance Principles (King III) (Institute of Directors in Southern Africa, 2009:14). Additionally, the enactment of Regulation 28 of the Pension Funds Act (2008) for instance, now requires pension funds to incorporate ESG factors into their investment policies, a significant indication of the market's desire to promote responsible investing in the country (Moikwatlhai, 2019:12; Usher, 2019:5). South Africa's leadership in integrated reporting reflects its commitment to fostering corporate transparency and sustainability in response to both local and global challenges (Chininga, Alhassan and Zeke, 2020:2; PwC, 2018:15).

One notable landmark in the country was the introduction of the Equity Growth Fund in 1992, South Africa's first Socially Responsible Investment (SRI) fund which aimed to promote long-term growth while practising ethical investment principles focused on economic empowerment and environmental sustainability (Viviers and Els, 2017:136). Over time, several other funds emerged such as the Future Growth Community Property Fund (1996) and Oasis Crescent Equity Fund (1998), further promoting the adoption of responsible investment. Additionally, the Johannesburg Stock Exchange (JSE) played a pivotal role in the field, launching the Socially Responsible Investment Index in 2004 which captured the performance of listed companies reputable for integrating the principles of the triple bottom line and good governance (JSE SRI, 2014:2). The index was eventually terminated in favour of the FTSE/JSE Responsible Investment Index in 2015 to better align with international standards and practices, ensuring that local companies were evaluated based on more robust and transparent criteria (JSE SRI, 2014:2)

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[1] The RDP was an integrated framework that sought to mobilize all its people towards the eradication of apartheid and the building of a democratic future based on six basic principles. Through elements like Building the Economy (restructuring for equitable growth), Developing Human Resources (skills and employment equity), Democratising the State (promoting accountability), and Meeting Basic Needs (efficient service delivery) (RDP,1994:8), the RDP aimed to link reconstruction and development in a process that would lead to growth in all parts of the economy (RDP,1994: 18)

From a theoretical perspective, the adoption of ESG aligns closely with both stakeholder and agency theories. Stakeholder theory, introduced by Freeman (1984), proposes that firms should not only focus on maximising shareholder wealth but also weigh up the interests of other stakeholders, such as employees, customers, and the environment in which they operate. This broad approach implies that ESG practices can drive long-term firm performance by cultivating trust, brand loyalty and operational efficiency, thus reducing risk and enhancing profitability over time (Chininga et al., 2020:3). In contrast, the agency theory highlights the potential conflict between managers and shareholders regarding ESG investments. While managers may prioritise ESG to enhance their reputation or meet regulatory requirements, shareholders could be more interested in the potential trade-offs between short-term rewards and long-term sustainability (Barnea and Rubin, 2010:84; Khan, 2019:105; Magubane and Wesi, 2023:306). Consequently, agency theory would suggest that ESG initiatives could have neutral or even negative effects on firm performance, as shareholders might view them as unnecessary costs that reduce short-term profitability without guaranteeing sufficient returns (Evans, Kramer, Lanfranchi and Brijlal, 2023:43).

A growing number of empirical studies have investigated the impacts of ESG on a firm's financial performance (Franzen, 2019; Han, 2016; Lin, Lee, Law, 2020; Muzanya, 2022; Ntoi, 2010). These studies offer mixed and inconclusive results, likely due to variations in their contexts, including study period, country, region, variable measurement, and methodology. Some studies advocate that investments in ESG positively affect a firm's performance (Dasgupta, 2022; Mazzioni et al., 2024; Wu and Chang, 2022), demonstrating the value-increasing, risk-reducing elements of ESG integration for firms. In contrast, other studies have shown that ESG investing decreases a firm's financial performance (Evans et al., 2023; Muzanya, 2022; Ntoi, 2010), suggesting that ESG investment may represent an additional cost incurred by firms, thereby misallocating resources that would otherwise be useful in other aspects of the firm.

1.3. Problem Statement

In recent years, ESG issues have gained increasing prominence within global investment and corporate governance frameworks. However, the nature and magnitude of ESG's impact on firm financial performance (FP) remains limited, particularly in emerging markets like South Africa. While a growing body of literature has explored the ESG–FP relationship in developed economies, empirical evidence from South Africa remains sparse and inconclusive.

Most South African studies rely on generalised linear estimation techniques such as Ordinary Least Squares (OLS) or fixed/random effects models that capture average effects but overlook distributional dynamics and firm-level heterogeneity (Chetty, Naidoo and Seetharam, 2015; Esterhuysen and Ward, 2011; Mitchell, 2014; Ward and Muller, 2009). As such, the potential for ESG factors to exert differential effects on firms based on size, industry, or performance levels remains underexplored. While

ESG research has gained momentum globally, local studies do not fully consider the broader economic environment. In particular, periods of market volatility, such as that introduced by the COVID-19 pandemic, may influence both firm performance and the implicit value of ESG practices. Moreover, much of the existing research focuses narrowly on either accounting- or market-based performance measures without examining how these metrics interact with individual ESG pillars across the performance spectrum.

Given South Africa's unique socio-economic context, ESG considerations are not only a governance issue but also an instrument for social and economic redress. However, the lack of nuanced analysis limits the relevance of prior findings to decision-makers, investors, and policymakers. This research, therefore, seeks to fill this gap by analysing the heterogeneous effects of ESG disclosure on firm financial performance across a panel of JSE-listed firms using both linear and quantile regression approaches. By doing so, the study aims to capture both the average and distribution-specific effects of ESG, while also controlling for external shocks such as COVID–19, offering more comprehensive insight into how ESG engagement influences firm value in the South African market.

1.4. Research Questions

The study seeks to address the following research questions:

1. What is the relationship between ESG disclosure and firm financial performance among companies listed on the Johannesburg Stock Exchange (JSE)?
2. Do the individual ESG pillars (ENV, SOC, and GOV) have differential effects on firm performance when measured using both market-based and accounting-based metrics?
3. Are the effects of ESG disclosure on firm performance heterogeneous across the conditional distribution of performance (i.e., for low-, mid-, and high-performing firms)?

1.5. Objectives of Research

The specified objectives of this study are to:

1. Investigate the relationship between ESG disclosure and firm financial performance among JSE-listed companies from 2012 to 2023.
2. Analyse the differential effects of the individual ESG pillars—Environmental, Social, and Governance—on both market-based and accounting-based measures of firm performance.
3. Determine whether the effects of ESG disclosure on firm financial performance vary across the conditional distribution of performance among JSE-listed companies.

1.6. Research Hypothesis

Based on the research objectives, the study formulates the following hypotheses to guide empirical testing:

(i) Hypothesis 1 – Overall ESG–FP Relationship

H_0: There is no relationship between ESG disclosure and firm financial performance among JSE-listed companies from 2012 to 2023.

H_1: There is a relationship between ESG disclosure and firm financial performance among JSE-listed companies from 2012 to 2023.

To test this hypothesis, the study employs the Fixed Effects (FE) and Random Effects (RE) panel regression models. These models are suitable for examining panel data over time and account for unobserved heterogeneity across firms. The FE model controls for time-invariant firm-specific characteristics, while the RE model captures both within- and between-entity variations. These linear models provide robust average effect estimates, making them appropriate for assessing the general ESG–FP relationship.

(ii) Hypothesis 2 – ESG Pillars and Financial Performance Measures

H_0: The individual ESG pillars (ENV, SOC, and GOV) do not have differential effects on firm financial performance.

H_1: The individual ESG pillars (ENV, SOC, and GOV) have differential effects on firm financial performance.

This hypothesis is evaluated using the same panel regression techniques (FE and RE), but with the ESG components disaggregated. By isolating the Environmental (ENV), Social (SOC), and Governance (GOV) scores, the analysis allows for the identification of the relative impact of each pillar on both accounting-based (ROE) and market-based (Tobin's Q and Market Capitalisation) performance indicators. This approach helps to clarify whether specific ESG dimensions contribute more significantly to firm performance, which has important implications for ESG strategy and disclosure priorities.

(iii) Hypothesis 3 – Heterogeneous ESG Effects Across Firm Performance Distribution

H_0: The impact of ESG disclosure on firm financial performance does not vary across the conditional distribution of firm performance.

H_1: The impact of ESG disclosure on firm financial performance varies across the conditional distribution of firm performance.

To capture these distributional effects, the study employs Panel Quantile Regression. This model allows for the estimation of ESG impacts at various points in the performance distribution (e.g., 25th, 50th, and 75th percentiles), providing deeper insights into whether ESG disclosure benefits low-, mid-, or high-performing firms differently. This is particularly relevant in the South African context, where firm characteristics and ESG maturity vary widely. The quantile approach offers a more nuanced understanding of ESG's role in financial performance, beyond what traditional linear models can reveal.

1.7. Methodology

The study aims to investigate the relationship between ESG factors and firm financial performance in South Africa over the period from 2012 to 2023. The study will adopt a positivist research approach. Specifically, the Quantile Panel Regression and the Fixed/Random Effect models will be employed for the empirical analysis to achieve the specified objectives of the study. The Quantile Panel Regression approach will make it possible to explore the non-linear effects of ESG and its pillars on the conditional distribution of financial performance indicators of firms. The technique is imperative in this study to analyse the relationships between variables, particularly when the relationship might vary across different parts of the performance distribution. Unlike traditional regression analysis which focuses on estimating the conditional mean, quantile regression focuses on estimating conditional properties and quantiles of the dependent variable, thereby helping uncover any potential heterogeneous effects.

1.8. Outline of the Chapters

The rest of the thesis is organised as follows: Chapter 2 reviews the literature; Chapter 3 provides the context of ESG developments globally and in South Africa; Chapters 4 and 5 present the methodology, empirical analyses, and results, respectively. Finally, Chapter 6 concludes the study and offers recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.1. Introduction

This chapter presents (i) the definition of concepts relevant to the study: Corporate Social Responsibility, ESG, and Financial Performance; (ii) the theoretical frameworks underpinning the study and lastly; and (iii) the empirical evidence on the subject from developed, emerging and the South African economies, respectively.

2.2. Conceptual Definitions

2.2.1. ESG

Tracing back to periods succeeding the Second World War, studies by Carroll (1979), Eells and Walton (1961), Friedman (1970), and McGuire (1969) offered various perspectives on the importance of Corporate Social Responsibility and its value in society. Corporate Social Responsibility (CSR) refers to sustainable strategies that firms employ to ensure that the operations of the firm are conducted ethically (Carroll, 1979:499). Alternatively, it is a concept in management in which organisations integrate social and environmental concerns into their strategies to positively influence their reputation and enhance their operations (Entrop and Groesbrink, 2022:1; Roberts, 1992: 596; Stellner et al., 2015: 538). What was apparent, however, was their conflicting views on the need for firms to fully embrace CSR aspects in every dimension of a firm's operation. Whilst some studies advocated that a 'corporation has a duty to society' (Carroll, 1979:501), others are of the stance that a firm is solely governed by its duty to maximise its welfare within the fence of law and ethical restrictions (Friedman, 1970:3; Levitt, 1958: 44).

Decades since the idea was first coined[2], the concept of CSR has undergone significant evolution with practices for disclosing environmental and social information increasing in amount and complexity (Gray et al., 2001:327). While CSR is an excellent means of driving awareness of an organisation's initiatives and growing responsibilities, increasing stakeholders' demand for transparency and accountability has facilitated the emergence of ESG sustainability reporting. If CSR is to be defined as a sustainability framework, then ESG is a sustainability assessment using Environmental, Social and Governance metrics to determine how sustainable and resilient a company is following its sustainability claims (Killian, 2021:302). The Corporate Social Responsibility framework of a firm helps in communicating its sustainability commitments, improving reputation, brand loyalty, credibility, and talent retention but the adoption of ESG takes a step forward to measure these efforts and provide a

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[2] The concept of CSR has evolved over decades, converging with Elkington's (1997) introduction of the 'Triple Bottom Line' framework. This framework emphasized economic, social and environmental sustainability through its focus on firms being conscious of "people, planet and profit" in their operations.

more precise assessment (Entrop and Groesbrink, 2022:1; Gray et al., 2001:327). As noted by Chininga et al., (2020:3), Naeem, Cankaya and Bildik (2022:130), Rao et al., (2023:1), ESG aids companies in setting and meeting targets, responding to macro-economic events, enhancing trust, and gaining insight into a firm's risk and opportunities. Ultimately, the concepts are intertwined to provide a comprehensive assessment of a firm's operations which translates into a positive implication for the society.

The term 'ESG' is an acronym for the Environmental, Social, and Governance factors that have emerged as critical considerations in the realm of financial analysis and investment decision-making (Entrop and Groesbrink, 2022:1). ESG factors incorporate a broad criterion of factors used to evaluate a company's performance and impact in areas beyond traditional financial metrics. The intrinsic motivation behind ESG factors lies in their ability to reflect a holistic view of a company's operations and risk profile (Dalal and Thaker, 2019:2; Entrop and Groesbrink, 2022:6). By weighing up environmental practices, their impact on society, and companies' governance structures, analysts and investors may gain valuable insight into how well a company is prepared to navigate challenges and capitalise on opportunities in an evolving global landscape. Additionally, ESG factors are not entirely about ethical considerations; they are increasingly seen as substantial to financial performance and value creation (Dube, 2020:30). In the words of the United Nations Principle of Responsible Investment (UN PRI, 2021:1), "Responsible investment is a strategy which seeks to incorporate Environmental(E), Social(S), and Governance(G) factors into investment policies, decisions, and ownership in a bid to generate sustainable risk-adjusted returns".

Normally, organisations include an analysis of their CSR in the corporate sustainability reports; however, relying on personal information provided by the firm may carry obvious shortcomings such as biased disclosure problems (Bezares et al, 2016:4; Chelawat and Trivedi, 2016:198; Giannopoulos et al., 2022:3; Izcan and Bektas, 2022:6). As such, third-party rating agencies are used to provide a comprehensive report on a variety of ESG-related metrics (Han, 2016: 66).

The next section presents the three pillars of ESG, defining the dimensions and expanding on the relative factors considered at each juncture. The following are the ESG components: the *Environmental pillar score (E), the Social pillar score (S) and the Governance pillar score (G).* Each of them is briefly discussed below:

The Environmental pillar score (E)

This pillar is based on three scores: First, the utilisation of resources which reflects a firm's capacity to reduce their energy consumption, water, and materials, and implement new complementary solutions that are more eco-efficient (Batae, 2020; 489). Second, emissions reduction is of vital importance as well, measuring the effectiveness and commitment of a firm in managing the negative externalities that arise from operational processes (Batae, 2020:489; Han, 2016:66). The environmental component also evaluates a firm's innovation, an aspect that reflects a firm's ability to commit to minimising environmental costs through new technologies, models, processes, or eco-designed products (Batae, 2020:489).

The Social pillar score (S)

This pillar is based on four category scores: First and foremost, the Workforce score assesses a firm's effectiveness in creating a safe, healthy and harmonious workplace, providing equal opportunities for its employees' careers, and maintaining job satisfaction along the way (Angela and Sari, 2023:2; Setyahuni and Handayani, 2020, p.7). Second, the Human Rights score focusses on a firm's adoption of and compliance with fundamental human rights conditions. Third, the Community score measures a commitment to uphold ethical business principles and promote public health. Finally, Product responsibility score assesses a firm's capacity to produce safe goods and provide quality services (Batae, 2020:489).

The Governance pillar score (G)

This pillar combines three dimensions: First, the management score represents the effectiveness of implementing strong corporate governance and good business practices. Second, the shareholder score highlights treatment and consideration towards shareholders, i.e., anti-takeover defences, shareholder rights, and privileges (Izcan and Bektas, 2022:7). Lastly, the CSR strategy score reflects a firm's aptitude to integrate and communicate their CSR initiatives in its daily activities to stakeholders (Batae, 2020:489).

ESG combined score (ESG summary score)

Aggregate ESG performance measure: The combined score is an aggregate view of ESG ratings of a firm's performance on E, S, and G factors. It provides a score that reflects an overall firm's initiative to integrate sustainable practices throughout their organisation. Typically, this score ranges from 0 to 100, where higher scores indicate a stronger commitment to ESG principles and a more extensive integration of sustainable practices across the organisation. A score closer to 100 reflects a company that performs well in implementing ESG initiatives, demonstrating high standards, while scores nearer to 0 suggest subpar engagement with ESG factors, indicating areas where the firm may lack a commitment to sustainable practices (Muzanya, 2022, p.17).

Third-party vendors such as Bloomberg, LSEG Refinitiv, KLD, ASSET4 evaluate and provide ESG performance data. Breaking down a firm's effort in adopting sustainable ESG practices. LSEG Refinitiv's ESG ratings, for example, are available for over 9,000 companies globally as far back as 2002. Refinitiv's established reputation and extensive coverage have made it a popular source in numerous studies such as those conducted by (Entrop and Groesbrink, 2022:11; Sokhela, 2022:26).

Refinitiv and other third-party vendors collect more than 450 company-related ESG facets of which the 186 most relevant and comparable measures for each industry are utilised in the 'ESG performance evaluation process. The 186 data points are divided into 10 categories, which are then weighted based on the three important pillars of ESG (Refinitiv, 2020:6). The final ESG scores are a result of a weighing scheme of the three pillars based on relative industry and its significant data points. However, because Refinitiv's scores are based on relative rankings within industries, they are not designed for direct cross-industry comparisons. This industry-specific tuning ensures that the ratings reflect firms' ESG performance relative to firms in their industry, offering a contextual view of their commitment to sustainable practices (Refinitiv, 2020:6).

By their design, ESG ratings depend on the methodology employed by a third-party rating agency (Ball, 2020, p.17). The ratings are intended to provide a holistic view of the materiality of individual ESG factors. These measurements are fairly robust and consistent but are subject to limitations to the extent that the scores are subjective to each agency and dependent on the accuracy of the information available to the specific vendors (Ball, 2020:17). However, the lack of standardisation results in low correlation between ESG ratings from different vendors as each uses distinct underlying ESG data points, weighting methodologies, and statistical tools to generate their scores (RCB, 2023:12). The subjectivity of these ratings is strongly thought to be a significant contributor to the variation in findings on the relationship between ESG performance and financial performance (Ball, 2020:63).

2.2.2. Financial performance

Like the case with ESG, financial performance (FP) holds no consensus on its measurement and definition. Studies over the years (Amin and Tauseef, 2022:3; Dalal and Thaker, 2019:4; Duque-Grisales and Agruilera-Caracuel, 2021:318; Masongewini, 2024:147) have offered valuable insight on how to view the performance of a firm. The concept of FP is broad, and it encompasses liquidity and solvency, activity, leverage, operating efficiency and profitability (Altman, 1968:590). Thus, to address the ESG-FP relationship, adopting a comprehensive evaluation of the primary FP components is crucial. The majority of studies include both accounting-based measures and market-based measures within their analysis. While acknowledging that neither accounting nor market measures are perfect, many researchers accept them as valid measures of firm performance (Gentry and Shen, 2013:517). While accounting metrics primarily capture the current performance of a firm's assets-in-place, market measures reflect not only these assets' performance but also the firm's investment opportunities, providing a better scope of its potential (Gentry and Shen, 2010:518). Bruna et al., (2022:2) advised that future research involving the measurement of financial performance should encompass not only economic efficiency but also other factors integral to a firm's financial concerns, such as the dynamics of revenue, expenses, and profitability.

The following section will present a review of the two performance measures, accounting- and market-based measures, offering insight into their definition, relevance, importance, and limitations.

I) ACCOUNTING-BASED MEASURES

Accounting-based measures are defined by Chetty, Naidoo and Seetharam (2015:196) as financial metrics that are derived from a company's financial statements and accounting records. More specifically, they are quantitative indicators based on financial data that provide insight into a company's profitability and efficiency. The measures encompass a set of financial ratios and metrics from income statements, balance sheets, and cash flow statements to evaluate a company's overall financial health. According to Ball (2020:19), accounting-based measures provide a good reflection of the overall efficiency of a firm and its alignment to commendable practices; a sentiment carried by Chininga et al., (2020), Eccles, Ioannou and Sarafeim (2013), and Khan and Sarafeim (2016) as well. Unfortunately, these measures have been criticised because they are susceptible to manipulation by managers who change accounting methods or accruals. They are also influenced by inflation, and they may be challenging to integrate between sectors (Velnampy and Pratheepkanth, 2013:12; Ball, 2020:34). Chetty et al., (2015:196) summarised the limitations of accounting-based measures well, stating that it is limited to providing the historical aspect of financial performance and fails to give foresight into the future.

Based on the current developments in the field, numerous researchers such as Dalal and Thaker (2019), El Khoury, Naimy and Iskandar (2021), Els, Erasmus Viviers (2014), Franzen (2019), and Johnson (2019) employ ratios such as Returns on Assets (ROA), Earnings per Share (EPS), and Debt-to-Equity (Leverage) extensively to represent the accounting-based aspect of firm performance. Below are several key accounting-based measures used in the majority of studies examining the relationship between ESG and financial performance:

TABLE 1: ACCOUNTING BASED MEASURES

TERM	DEFINITION
Earnings per Share (EPS)	This is the profit per share of common stock, calculated by dividing the net income by the outstanding shares (Johnson, 2019:2).
Return on Assets (ROA)	Efficiency in using assets to generate profit, calculated by dividing net income by average total assets (Johnson, 2019:2).
Return on Equity (ROE)	Profitability relative to shareholder investments, is calculated by dividing net income by average shareholders' equity (Mitchell, 2014:57).
Profit Margin	Percentage of revenue translating into profit after all expenses are accounted for.
Asset Turnover	Efficiency in using assets to generate revenue (Mitchell, 2014:57).
Debt-to-Equity Ratio (Leverage)	Proportion of debt used to finance operations relative to equity (Batae, 2020:490).

II) MARKET-BASED MEASURES

As useful as accounting-based measures are, they fail to capture all the elements that contribute to the financial performance of a firm. External stakeholders are known to impact a firm’s financial performance, and this influence is captured by market-based measures. Therefore, it is essential to include these performance metrics in any representation of the financial performance of a firm (Eccles, Ioannou and Sarafeim, 2013:9).

Market-based measures are financial metrics that are derived from the market value of a company's securities, such as its stock price, and are used to evaluate the market's perspective on a company's value and performance. These measures reflect how investors and the market as a whole view the company’s prospect and are impacted by factors such as supply and demand over a company’s shares, investor sentiment, and market conditions (Johnson, 2019:2). Additionally, market-based measures are less subjected to manipulation from managers compared to accounting-based metrics. These measures are often utilised by the potential investors of a firm (Els, Erasmus and Viviers, 2014, p. 34; Johnson, 2019:5).

The market-based measures that are commonly used in the empirical literature include the earnings yield (EY) and total shareholder return (TSR) ratios. The EY ratio is a popular indication of value as it compares the Earnings Per Share (EPS) to the market price per share. The TSR measure considers the dividend income and the change in the share price over the investment horizon (Cooper, 2017:14; Megginson, Smart and Graham, 2010:22)

Some examples of market-based measures include:

TABLE 2: MARKET-BASED MEASURES

TERM	DEFINITION
Market Capitalisation	The total value of a company's outstanding shares of stock is calculated by multiplying the current stock price by the total number of outstanding shares (Ball, 2020:37)
Tobin's Q	Tobin's Q ratio compares the market value of a company to the replacement cost of its assets. It is used to assess whether a company is undervalued or overvalued in the market (Veeravel, Sadharma and Kamaiah, 2023:745)
Price-to-Earnings (P/E) Ratio	This is a financial metric that measures the relationship between a company's stock price and its earnings per share (EPS). It is a valuation ratio that indicates how much investors are willing to pay for a dollar of a company's earnings.
Price-to-Book (P/B) Ratio	A valuation ratio that compares a company's current stock price to its book value per share, providing insight into whether a stock is undervalued or overvalued (Veeravel, Sadharma and Kamaiah, 2023:745)
Dividend Yield	A ratio that measures the annual dividend income as a percentage of the current stock price, indicating the return on investment from dividends (Ball, 2020:20).
Stock Price Returns	The difference in the growth of a company's share price over time is often expressed as a percentage to measure the return generated for investors (Ball, 2020:36)

2.3. Theoretical Framework

Responsible investment (RI) decisions that cater for ESG factors in addition to financial performance aspects have gained prominence globally, owing to international trade and global integration (Brondoni and Mosca, 2017:1). The rise of ESG factors in financial analysis reflects a broader shift towards sustainable and responsible investing practices. As investors increasingly recognise the materiality[3] of ESG factors in driving financial performance and risk management, the integration of ESG in formulating investment strategies has become a strategic imperative. Ultimately, ESG is now considered

3 Materiality refers to addressing issues with the greatest probability of impact on the business as a priority, with less attention given to issues of limited impact. A firm should rank factors that have the greatest relevance in its operations more highly than those that do not (NYU Stern, 2019:2).

an investment philosophy adopted by a growing proportion of large investment institutions (Hartzmark and Sussman, 2019:11; Kalia and Aggarwal, 2022, p.155; Sutopo et al., 2018: 4).

Several theories underpin the relationship between ESG and its contribution to a firm's financial performance, most notably signalling theory (Spence, 1973), agency theory (Jensen and Meckling, 1976), resource dependency theory (Pfeffer and Salancik, 1978), stakeholder theory (Freeman, 1984), and legitimacy theory (Suchman, 1995). This section provides a review of the theories that explain the relationship between ESG and the financial performance of firms focusing on two most influential theories – stakeholder theory and agency cost theory. The two theories are found to address external and internal factors influencing performance more comprehensively than their counterparts (Wu and Chang, 2022: 1527). The two theories emphasise the importance of managing stakeholder relations as a means for long-term sustainability, aligning management action with shareholder interests, and reducing conflicts to enhance financial performance.

Freeman (1984) is credited with defining the stakeholder theory, asserting that as the real purpose of a company is to serve as a vehicle to coordinate the interest of stakeholders. Over the years, many authors, and key figures[4] in finance have emphasised that by communicating a firm's social performance with stakeholders such as investors and employees, the firm's reputation and performance would likely improve (Mans-Kemp, 2020: 2; Mazzioni et al, 2024: 29; Ntoi, 2010:14). The idea is that the social responsibility of a business is to maximise monetary returns, which predicts that a firm's pursuit of non-financial objectives obscures it from maximising shareholder wealth (Chininga et al., 2020: 5).

Additionally, the stakeholder theory states that every firm has several stakeholders that influence and are influenced by the activities of a firm (Moskowitz, 1972). First, the theory suggests that greater ESG compliance would result in growing mutual trust and increased cooperation between the firm and its various stakeholders, thus leading to positive firm performance. Additionally, advocates of the theory (Jones, 1995; Li et al., 2018) conclude that greater ESG compliance satisfies the interest of non-owner stakeholders such as debtors, employees, customers, and regulators thus establishing new platforms for more efficient contracting, business growth, risk reduction and long-term value creation. Displaying socially responsible behaviour and better environmental and social performance acts as a resource

3 Lagarde, C. (2024). Central banks in a changing world: The role of the ECB in the face of climate and environmental risks. Speech at the Maurice Allais Foundation, Paris.

4 NYU Stern Center for Sustainable Business. (2021). ESG and financial performance: Uncovering the relationship by aggregating evidence from 1,000 plus studies published between 2015 and 2020.

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which enhances firm performance (Kalia and Aggrawal, 2022:158). This is in alignment with past literature and the stakeholder theory.

Despite the positive relationship between ESG and firm performance as suggested by the stakeholder theory, some criticisms of the theory have also emerged. For instance, Xiao (2013, p.29) suggests that the stakeholder theory is limited in the sense that it lacks clarity on key aspects such as clearly defining a firm's stakeholders and the difficulty of justifying multiple stakeholders' demands which may be conflicting. This ultimately leads to the exclusion of certain groups who potentially have an impact on the financial performance of the firm.

Secondly, the agency theory is based on the idea that when a company is first established, ownership and management are inseparable. As a company grows, ownership begins to branch out of management and delegate the operations of the firm to managers who aim to work in the best interests of its owners and stakeholders. Jensen and Meckling (1976) developed agency theory to capture the conflicts of interest that are borne from the governance of a company and its stakeholders: owners, shareholders, debtors etc. In broad terms, the agency theory refers to any relationship between two parties in which one, the agent, represents the other, the principal, in day-to-day transactions and the disputes and conflicts of interest that arise from their agreements (Breuer and Nau, 2014, p.10; Evans et al., 2023:43). Some of the conflicts of interest include moral hazard, levels of effort, earnings retention, risk aversion and differences in time horizons. If any of these costs are observed in an organisation, one can deduce that an agency problem is present (Hall,1996:146).

Agency costs are the costs of having an agent make decisions on behalf of a principal. Concerning corporate governance, agency costs are the costs that the stakeholders incur by having managers run the company instead of running the company themselves (Batae, 2020:485; Wu and Chang, 2022:1529). This misalignment can result in reduced focus on long-term responsible investments such as ESG activities. Managers, working under pressure from stakeholders, may be focused on short-term profitability at the expense of sustainability, which could justify the negative relationship between ESG initiatives and firm financial performance.

In essence, the theory binds agents such as traders, advisors, and financial institutions in precarious situations that make responsible investments not so straightforward. To further expand on the two theories, Beerbaum and Puaschunder (2019:2) use the element of behavioural economics to cater for the fallacies that humans, each being unique, ultimately make irrational decisions influenced by their surroundings, emotions, personal lives and are likely to chase short-term financial gains rather than long-term rewards. Therefore, with responsible investing being oriented towards the long-term, it is often against the financial market that tends to lean into short-termism, a situation whereby pressure from stakeholders has often led managers to focus on achieving short-term profitability at the expense of longer-term sustainability (Amaeshi and Grayson, 2009:53; Evans et al., 2023:43). This explanation attempts to account for some of the negative relationships between ESG and a firm's financial performance suggested by the agency cost theory and uncovered by studies (e.g., Duque-Grisales and Caracuel, 2019; Nekhili, Boukadhaba and Nagati, 2019; Qureshi et al., 2021).

The stakeholder theory and the agency theory along with the empirical evidence of prior studies (e.g., Chininga et al., 2020; Evans, 2023; Khan, Serafeim, and Yoon, 2016; Xie et al., 2019) demonstrate that firms which adopt a more sustainable and long-term approach in line with stakeholder's goals are likely to enjoy multiple rewards including improving financial performance while the agency cost theory stands to justify the possible negative relationships that exist about firms and their financial performance. Performing ESG activities is a means of communicating a commitment towards the needs and priorities of stakeholders (Kalia and Aggarwal, 2022:3). Literature also documents additional operational and financial benefits of performing ESG activities such as better corporate credit ratings and reduced financing costs in addition to increased revenue and higher returns (Naeem, Cankaya and Bildik, 2022:138). While the stakeholder theory posits a more positive outlook, the agency theory presents a sceptical view of ESG activities, suggesting a divergence between managers and stakeholder interests ultimately leads to negative impacts on a firm's profitability, especially when the ESG initiatives do not directly align with short-term financial goals (Barnea and Rubin, 2010; Duque-Grisales and Caracuel, 2019).

This theoretical divergence becomes more apparent when considering country-level development. In emerging markets with weaker institutional frameworks and less robust investor protection, firms are more likely to struggle with aligning ESG initiatives with profit maximisation (Khanna and Palepu, 2010:1). This can result in a negative relationship between ESG activities and firm performance, as suggested by studies in these markets (Nekhili, Boukadhaba, and Nagati, 2019:148). In developed markets, however, the stronger institutional environments provide greater alignment between ESG goals and shareholder value. Firms in these countries are more likely to see a positive relationship between ESG activities and financial performance, as stakeholders reward long-term sustainable practices, and governance mechanisms ensure alignment between managerial actions and shareholder interests (Amaeshi and Grayson, 2009:53; Evans et al., 2023:44).

Thus, theoretically, the exact effect of ESG on financial performance is an ambiguous a priori. The effect of ESG on firm performance may be influenced by the level of institutional development of a country. Hence, what is obtainable in a country at a particular time becomes an empirical question. This explains why a growing body of studies has been devoted to exploring the nature of the effect of ESG on financial performance across different countries. Although this study does not compare the findings between country-level dynamics empirically, the underlying assumptions are worth noting. The next section reviews the empirical literature.

2.4. Empirical Literature

This section reviews the literature exploring the relationship between ESG and financial performance across (i) developed countries, (ii) developing and emerging countries and finally, (iii) studies in the South African domain.

2.4.1. ESG and financial performance: developed countries

This section reviews studies conducted in the developed world relating to ESG and its effect on the performance of firms, highlighting strengths, weaknesses, limitations, its growth and importance over the last few decades. The summary table (3) at the end of the section provides a compilation of articles reviewed for this section, offering a more condensed outlook of the ESG-firm performance literature in developed countries.

The earliest empirical studies in the field of sustainability investigate the role of Corporate Social Responsibility (CSR) on firm financial performance as a proxy for ESG which was not a fully established framework until the mid-2000s. Eccles, Ioannou and Sarafeim (2013) investigated the effect of corporate sustainability on organisational processes and performance from 1993 – 2009. CSR was measured using the SAM Corporate Sustainability Assessment (CSA)[5] which covers 20 different key themes on corporate governance, human capital development, and risk management and integrates them into an index. Using a sample of 180 US companies' financial performance data, such as profit margins, ROA, stock price returns, revenue growth etc, the authors employed a fixed and random effects model and found that corporations that voluntarily adopted sustainability policies by 1993 – termed as high sustainability companies – exhibit by 2009, distinct organisational processes that account for elements of CSR compared to a matched sample of firms that adopted almost none of these policies – termed as low sustainability companies. Eccles et al., (2013) found that 93% of companies deemed highly sustainable disclosed all aspects of non-financial information in comparison to only 53% of low sustainable firms. This transparency reflects a robust ESG framework, essential for attracting a greater proportion of long-term investors in high sustainability companies at 24.4% in comparison to low sustainability firms at 20.7%. Additionally, Eccles et al., (2013) recognised that companies regarded as

5 The SAM Corporate Sustainability Assessment (CSA) is a rule-based methodology to convert over 500 data points per company into a total sustainability score. It includes 61 industry-specific questionnaires covering economic, social and environmental dimensions. CSA results have been integrated into renowned indices like the Dow Jones Sustainability Indices (DJSI) and the S&P ESG Index family (S&P Global, 2020)

highly sustainable provided a higher abnormal return by 4.8% on a value-weighted basis and 2.3% on an equal-weighted basis in comparison to low-sustainable firms.

The study by Bezares et al., (2016) examined the relationship between corporate sustainability and shareholder wealth creation for a panel of sixty-five FTSE 350 companies between 2006-2012 using the Four-Factor Carhart's model. Bezares et al., (2016) use performance data such as stock returns, market capitalisation, and book-to-market value and construct a Corporate Sustainability Index (CSI) based on the degree of adopting corporate sustainability as a concept within business strategy and operations. The study found that an equally weighted portfolio of sustainable firms generated an annualised return of 7.18% while the market portfolio only generated 1.24% over the same period. Additionally, Bezares et al., (2016) compared the long-term stock returns on value-weighted portfolios to eliminate the distortions caused by firm-specific characteristics and found that sustainable portfolios generate an annualised return of 5.73% in comparison to the FTSE portfolio at 0.98%, a performance gap of 4.75% annually. Similarly, studies such as (Khan, Sarafeim and Yoon, 2015; Rossi et al., 2021) have explored the role of corporate sustainability on firm performance in developed nations such as the United States, Italy, Spain, Germany and France by constructing sustainability indices based on sustainability data collected from MSCI KLD and ASSET4 databases respectively. Controlling for financial aspects such as leverage and firm size, these studies found significant evidence that firms with superior performance on sustainability issues outperformed their counterparts, further supporting the notion that CSR practices may trigger extra certainty that positively affects their valuation of a firm.

A different approach to examining the impact of corporate social responsibility on firm value is conducted by Entrop and Groesbrink (2022) who estimate the relationship using unconditional quantile regression (UQR). Entrop and Groesbrink (2022) collected CSR scores and 12,013 data observations from Refinitiv and MSCI for all constituent firms on the NYSE, NASDAQ and AMEX over the period 2002 to 2019, and the UQR revealed that CSR had a significant impact on firm risk and value, with strong risk-reducing and value-enhancing effects observed. While the direct impact of ESG summary scores on firm risk and value was not significant, the analysis did reveal heterogeneous effects across different quantiles of the distribution of dependent variables (Entrop and Groesbrink, 2022). The results of the study highlight the loss-reducing benefits that firms experience over time from sustainable practices, prevalent in numerous contemporary studies (Eccles, Ioannou and Sarafeim, 2013:18; Han et al., 2016:74; Bezares et al., 2016:3).

Essentially, the studies examining the role of CSR in influencing positive firm financial performance are promising, with studies such as Eccles et al., (2013:10) and Bezares et al., (2016:5) displaying a pattern that aligns with the stakeholder theory. Adding to this, studies such as Entrop and Groesbrink (2022:2) and Rossi et al., (2021:11) have also highlighted additional benefits that accrue to firms' commitment to sustainable practices with the evidence displaying risk-reducing properties, enhanced brand perception, employee satisfaction and attracting investors. Furthermore, certain studies have examined the unconditional distribution of CSR activities on firm performance (Entrop and Groesbrink, 2022; Han et al., 2016) and found evidence of heterogeneous effects and increasing relevance over time, indicating that the relationship is unique for each firm practising sustainable practices and suggesting the relationship evolves, aligning well with the expectations of agency-cost theory.

Studies in recent times have incorporated the use of ESG data sourced from several credible third-party vendors such as the LSEG, MSCI KLD, ASSET4, Bloomberg and Yahoo Finance to evaluate the role of sustainability influencing firm performance. While there is a predominantly positive trend in studies in developed markets (Almeyda and Darmansyah, 2019; Khan and Sarafeim, 2015; Kouaib and Amara, 2022), there is also concern that many studies find either negative or inconclusive results (El Khoury et al., 2021; Franzen, 2019;). Margolis, Elfenbein and Walsh (2009:15) believe that the conflict in results may be due to differing definitions of the independent and dependent variables, sampling techniques, research designs and periods of study. In terms of financial performance, the studies in the developed market reviewed make use of both market-based and accounting-based measures as proxies of financial performance (Almeyda and Darmansyah, 2019; Franzen, 2019; Han, Kim and Yu, 2016; Nekhili, Boukadhaba and Nagati, 2019) to uncover the impact of ESG disclosure on firm performance.

The use of comprehensive ESG data since the turn of the decade has been notable. Almeyda and Darmansyah (2019), aiming to uncover the influence of ESG ratings on the financial performance of real estate companies from the G7 countries between 2014-2018 utilised a basic multivariate panel regression. The authors found evidence of a significant positive influence of ESG disclosure on the performance variables of ROA and ROC, consistent with prevailing evidence from developed countries over similar research periods (Han et al., 2016; Rossi et al, 2021). The study also found a statistically significant positive relationship between environmental disclosure with ROC and stock price returns which is contrary to previous studies in developed countries that recognised either no significance or even a negative relationship between environmental disclosure and stock price returns (Franzen, 2019; Han et al., 2016). Despite being conducted years following the Global Financial Crisis, no significant relationship was uncovered between the ESG summary scores with stock prices and the P/E ratio (El Khoury et al., 2021; Han, 2016; Qureshi et al, 2021).

Based on industry analysis, Amin and Tauseef (2022) investigated the presence of an optimal ESG score from 438 Chinese listed firms (48 financial and 380 non-financial firms) over the period 2010-2020, employing a panel regression analysis and a mix of accounting and market-based variables. The study revealed the presence of a non-linear association between a firm's ESG score and its financial performance which enhanced the thoughts of an optimal level of ESG. Concerning the non-financial sector, an investigation of separate ESG scores and Tobin’s Q revealed a positive link relating to the environmental pillar and a negative link relating to the social pillar rating. Overall, this study enhances the idea of an optimal level of Environmental, Social or Governance scores for a firm, which has implications for the firm's management regarding the level of investment in ESG initiatives.

Bruna, Loprevite and Raucci (2022) presented further evidence of the non-linear relationships that exist across different firms and industries when assessing the impact of ESG on a firm's financial performance through their analysis of 350 European listed companies for the period 2014 to 2019. Utilising a time-lagged panel regression as well as a fixed effects model on ESG and five financial aspects encompassing leverage, profitability, activity, operating efficiency, and liquidity. Bruna, et al., (2022) observed that with all companies except the smallest, a decreasing trend (a negative relationship that gets weaker) is initially observed in FP up to a mid-value of ESG scoring, from which point FP shows a moderate increase. From a managerial perspective, these findings show that ESG commitment is negatively associated with FP up to a certain level of ESG, while continued efforts in corporate sustainability result in partial improvements in financial performance. These discoveries are consistent with prevailing literature (e.g., Friede, Busch and Bassen, 2015; Han et al., 2016; Xie et al., 2018) whose studies acknowledge that investments in sustainable practices will incur financial consequences in the early stages of development before observing significant positive results. Additionally, the observed trend in ESG and financial performance is in line with the stakeholder and that postulate that the focus on the holistic integration of corporate sustainable practices and ultimately ESG, is expected to incur losses in the infancy stages before realising long-term rewards (Entrop, 2022; Li et al., 2018).

Furthermore, Wu and Chang (2022) examined the relationship between ESG disclosure and firm value in Taiwan's high-tech industry, utilising a quantile regression analysis to examine the potential non-linear effects of ESG factors on firm value for the period 2005 - 2020. Financial performance data such as firm size, financial leverage, and stock price returns from 38 TSE-listed high-tech firms were analysed and the findings revealed a concave-convex [6]Relationship between ESG disclosure and firm value, with the E component and S component disclosures driving the results. Such a pattern implies that there is an optimal level of ESG disclosure that maximises firm value, beyond which further increases may not lead to additional benefits or could even have diminishing returns, like the discoveries of (Bruna, Loprevite and Raucci, 2022; Khan, Sarafeim, Yoon, 2016). The study concluded that high-tech firms allocating resources to environmental and social projects could enhance their firm value,

[6] A concave-convex relationship describes a pattern where the relationship between two variables changes direction as one of the variables increases. Initially, the relationship is concave, meaning that increases in the independent variable (e.g., ESG disclosure) result in progressively smaller gains in the dependent variable (e.g., firm performance). Beyond a certain threshold, the relationship becomes convex, where further increases in the independent variable may no longer benefit or even harm the dependent variable, reflecting diminishing returns.

emphasizing the importance of ESG performance for stakeholder evaluation and future performance assessment (Wu and Chang, 2022).

The sentiment is carried by Rossi, Chouaibi and Jilani (2021) who in their study of 225 companies in the G7 countries over the period 2015-2018 found that firms that went the extra mile in integrating elements of ESG and performed sustainably had greater non-financial disclosure, responsible for triggering positive effects on the valuation of their businesses up to a certain point, measured by financial variables such as stock price returns, returns on equity, and returns on assets.

As forementioned, not all studies from the developed world report the same patterns. For instance, Franzen (2019) studied the relationship between ESG and the financial performance of S&P 500 firms for the period 2002 to 2017. The firms on the S&P 500 were divided into three portfolios based on their ESG score and grouped into low, medium, and high-ESG score portfolios and utilised stock returns as a proxy for financial performance. Employing the fixed-effect model and the Fama-French Five-Factor model, Franzen (2019) found that the overall assessment of the portfolios displayed no significant evidence that supports ESG having a positive effect on the FP variable of stock returns. However, the portfolios constructed based on the low-ESG scores were found to outperform those portfolios based on high-ESG scores, with the latter displaying a negative abnormal return and lower Sharpe ratio. The authors suggest that such results may be contrary to expectation as the elements of environmental care, social considerations and governance structures were not critical considerations in the investment landscape and firms that actively pursued these endeavours did not realise discernible financial rewards in the immediate aftermath. Insignificant and even negative relationships are also reported by various studies conducted in developed countries (El Khoury et al., 2021; Han, et al., 2016; Qureshi, Akbar and Poulova, 2021).

Nollet, Filis and Mitrokostas (2016) investigated the relationship between ESG and financial performance for all firms listed in the S&P 500 stock market index during the period 2007-2011 utilising accounting and market-based measures such as ROA, Returns on Capital (ROC), leverage and stock price returns as a measure of financial performance using a panel regression analysis. The results of their analysis suggest that the effect of ESG on FP is positive, although insignificant. Further tests that include the lagged ESG coefficients reveal negative but insignificant results as well, therefore rejecting the hypothesis that ESG positively affects firm performance.

Similarly, Qureshi et al., (2021) employed a Panel Vector Auto-Regression (PVAR) model on a sample of the 100 best corporate citizens in the USA over the period 2009-2018 and uncovered insignificant evidence of a causal relationship between ESG and financial performance. Furthermore, El Khoury et al., (2021) analysed the relationship using 108 firms in the industrial sector in East Asia over the period 2011-2017 and found that the impact of ESG on market performance differed across industries, with ESG negatively affecting the transportation industry but showing no impact in the capital goods industry. Although the aforementioned studies differ both in methodology and region of study, some evidence from contemporary literature (Bezares et al., 2016; Lupu and Hurduzeu, 2022; Yoo and Managi, 2022) has suggested that the financial crisis that occurred 2008-2009 had an impact on the ESG's effect on stock return and other financial indicators which suggest that when assessing the ESG effect on stock return, it is crucial to consider the post- or pre- financial crisis impact (Franzen, 2019:21).

The literature uncovered through this section sheds light on the complex and ever-evolving relationship between ESG factors as they relate to the financial performance of firms in the developed world. Studies by Eccles, Ioannou and Sarafeim (2013) and others have highlighted the positive impact of corporate sustainability on organisational processes and performance, underlining the importance of ESG integration for long-term success. While some studies (e.g., Bezares et al., 2016; Khan, Sarafeim, and Yoon, 2015) have shown that firms excelling in sustainability outperform their counterparts in developed nations, other studies, (e.g., El Khoury et al., 2021; Han et al., 2016) have reported insignificant or even negative relationships between ESG disclosure and financial performance. Furthermore, recent studies, such as those by Bruna, Loprevite, Raucci (2022) and Wu and Chang (2022), have revealed non-linear relationships between ESG scores and financial performance, indicating the presence of an optimal level of ESG that maximises firm value. Often, the evidence is encouraging and supportive of the value-enhancing, risk-reducing and performance benefits of ESG on a firm's long-term performance. This intricate landscape suggests that the impact of ESG on financial outcomes varies across industries, regions, periods, and the effects of global events, highlighting the need for a comprehensive understanding of these dynamics.

TABLE 3: SUMMARY OF LITERATURE: DEVELOPED COUNTRIES

STUDY	COUNTRY	YEAR OF STUDY	ECON. MODEL	DEPENDENT VARIABLES	INDEPENDENT VARIABLES	CONTROL VARIABLES	FINDINGS
Cheng, Ioannou and Sarafeim (2011)	United States	2002 - 2009	Three-stage OLS regression model	KZ index: constructed from accounting ratios	Author constructed CSR index	Firm size Industry dummy	Positive: Firms with better CSR performance face lower capital constraints. Enhanced CSR activities and transparency reduce agency costs and informational asymmetry. Both social and environmental dimensions of CSR contribute significantly to easing capital constraints.
Eccles, Ioannou and Sarafeim (2013)	United States	1999 – 2009	Ols regression model Fixed and random effect models	TSR ROE	CSR Dummies: (1).High Sustainability firms.(2).Low Sustainability firms	Firm Size MBV Leverage Industry dummy ROA	Positive: High-sustainability companies are more likely to have established processes for stakeholder engagement, are more long-term oriented, and exhibit higher measurement and disclosure of nonfinancial information. High sustainability companies outperform low sustainability companies in both stock market and accounting performance.
Khan and Sarafeim (2015)	United States	1991-2013	-Fixed effects model Random effects model	TSR Return on sales Sales growth	CSR performance index	Firm size MBV Leverage	Positive: Firms with superior performance on material sustainability issues outperform their counterparts financially. The results suggest that recent accounting standard-setting efforts

STUDY	COUNTRY	YEAR OF STUDY	ECON. MODEL	DEPENDENT VARIABLES	INDEPENDENT VARIABLES	CONTROL VARIABLES	FINDINGS
						ROA Industry dummy	for nonfinancial information are successful in separating material from less material information for investment purposes. Firms with strong performance on material issues exhibit better future changes in accounting performance.
Bezares, W.Przychodzen and J. Przychodzen (2016)	United Kingdom	2006-2012	The Carhart Four-Factor Model	TSR TSR volatility	CSR performance index	Industry dummy Firm size MBV	Positive: Companies with balanced CS activities earned an annual four-factor alpha of 3.54% for a value-weighted portfolio CS was negatively correlated with stock return volatility, indicating more stable stock prices. Sustainable companies showed higher resistance to stock market crashes, protecting shareholder wealth during economic downturns.
Han (2016)	Korea	2008 – 2014	Panel Regression analysis	ROE MBV TSR	ESG summary scores ESG pillar scores	Leverage Firm Size Cross ESG pillars	Mixed: The environmental performance score presents a negative (or U curve) relationship with FP, and the governance performance score presents a positive (or inverse U curve) relationship with FP. The study did not find any statistically significant

STUDY	COUNTRY	YEAR OF STUDY	ECON. MODEL	DEPENDENT VARIABLES	INDEPENDENT VARIABLES	CONTROL VARIABLES	FINDINGS
							evidence of a relationship between social performance scores and FP.
Franzen (2019)	United States	2002 – 2017	Pooled Ols Fixed effects model Fama-French Five-Factor Model	TSR	ESG summary scores ESG pillar scores	Tobin's q ROA Firm size Leverage	Insignificant: ESG shows minimal impact on stock returns, with some influence during the 2008–2009 financial crisis. However, the fixed effect results show evidence that the financial crisis of 2008-2009 had an impact on the ESG's effect on stock returns.
Almeyda and Darmansyah (2019)	G7 countries (USA,UN,UK GER,JPN,ITA, CAN)	2014-2018	Basic Multivariate panel regression analysis	ROA ROC TSR P/E Ratio	ESG summary scores ESG pillar scores	TA Mkt Cap Country and Year dummy	Positive: ESG disclosure has a statistically significant positive relationship with ROA and ROC. ESG disclosure does not have a significant relationship with Stock Price and P/E Ratio. Shows a statistically significant positive relationship between ROC and Stock Price. No significant relationship with firm financial performance.
Rossi et al., (2021)	Europe (ITA, ESP, GER, FRA)	2015-2019	Linear regression analysis Panel data analysis	ROA	CSR Performance Index	Firm size Leverage	Positive: The findings from this study have indicated a positive effect between CSR practice and the firm's financial performance. Therefore, for investors, CSR practices may trigger extra

STUDY	COUNTRY	YEAR OF STUDY	ECON. MODEL	DEPENDENT VARIABLES	INDEPENDENT VARIABLES	CONTROL VARIABLES	FINDINGS
							certainty that positively affects their valuation of the business.
Qureshi et al (2021)	USA	2009-2018	The study employed a panel vector auto-regression (PVAR) model	MBV Tobin's Q ROE ROA	ESG summary scores ESG pillar scores	Firm size	Mixed: The study confirms a relationship between ESG and CFP, particularly for market-based measures like the Market-to-Book ratio (MTB) and Tobin's Q (TQ). There is no evidence of a reverse relationship (CFP affecting ESGP). The marginal cost of improving social conduct outweighs its benefits, negatively impacting firm performance.
Amin and Tauseef (2022)	China	2010 – 2020	Panel regression analysis	ROE ROA Tobin's Q Holding period ret	ESG summary scores ESG pillar scores	Beta Mkt Cap MBV Sales growth Leverage	Mixed: Concerning the non-financial sector, ESG scores and Tobin's Q revealed a positive link relating to the E pillar and a negative link to the S pillar. The financial sector however revealed a positive link relating to the environment pillar and a negative link relating to social factor rating.
Entrop (2022)	USA	2002 – 2019	Fixed Effects model Unconditional Quantile	CSR performance scores	Total risk Idiosyncratic risk Systematic risk	Firm size Cap Exp RandD Exp	Positive: CSR has a risk-reducing influence on total risk, idiosyncratic risk, and systematic risk, especially for firms with low to medium risk levels. CSR

STUDY	COUNTRY	YEAR OF STUDY	ECON. MODEL	DEPENDENT VARIABLES	INDEPENDENT VARIABLES	CONTROL VARIABLES	FINDINGS
			Regression analysis		Tobin's q	Leverage ROA ROE	enhances firm value, particularly for firms with low to medium firm value. The impact of CSR varies significantly across different quantiles of the risk and value distributions.
Wu and Chang (2022)	Taiwan	2005 – 2020	Quantile regression analysis	ESG Summary scores ESG pillar scores	Tobin's Q	Firm size Leverage Growth of owner's Equity RandD to sales ratio	Mixed: There is a nonlinear concave-convex relationship between ESG disclosure and firm value (FV), indicating an optimal level of ESG activities. The environmental (ESGE) and social (ESGS) pillars show a concave-convex relationship with FV, suggesting that moderate investments in these areas can enhance firm value. The governance (ESGG) pillar does not have a significant impact on FV.
Bruna, Loprevite and Raucci (2022)	Europe	2014 – 2019	Time lagged panel regression model Fixed effects model	ESG summary scores Firm size	FP-score: constructed using PCA and DEA	Industry dummy	Mixed: The study confirms a non-linear relationship between ESG performance and financial performance. ESG performance has a positive and significant impact on financial performance, especially under a mandatory disclosure regime. The impact varies by company size, with

STUDY	COUNTRY	YEAR OF STUDY	ECON. MODEL	DEPENDENT VARIABLES	INDEPENDENT VARIABLES	CONTROL VARIABLES	FINDINGS
			Random effects model				medium-sized companies showing a more favourable association between ESG and financial performance. Smaller companies often see a negative impact at lower levels of ESG performance.
Kouaib and Amara (2022)	Saudi Arabia	2018 – 2021	Multivariate regression analysis	CSR performance index Corporate Gov score	RandD Exp Capital Exp	Firm size Leverage ROA	Positive: CSR Reporting: Positively and significantly affects investment decisions. Corporate Governance: Positively impacts investment decisions. Moderating Effect: Corporate governance practices positively moderate the relationship between CSR disclosure and investment decisions.
Zhou, Liu and Luo (2022)	China	2014 – 2019	Fixed Effects and Random Effects Model	Tobin's Q ROE Net Profit growth rate	ESG summary scores	Firm size Leverage Cash-to-TA ratio GDP per capita	Positive: The results show that the improvement of ESG performance of listed companies is beneficial to the improvement of the company's operating capacity but has no significant effect on the company's profitability and growth capacity. The improvement of ESG performance of listed companies is

STUDY	COUNTRY	YEAR OF STUDY	ECON. MODEL	DEPENDENT VARIABLES	INDEPENDENT VARIABLES	CONTROL VARIABLES	FINDINGS
							conducive to enhancing the market value of the company,

2.4.2. ESG and financial performance: emerging countries

Table (4) at the end of the section presents the studies that have explored the ESG and financial performance nexus for non-developed nations. The overall findings from the literature present a mixed bag of results with studies displaying positive-, negative -, and even insignificant findings which tend to give substance to the expressions of the agency cost theory – that a firm’s efforts to improve their sustainable initiatives manifest as additional costs incurred, thus reducing a firms’ performance. However, despite these realisations, most of the studies advocate for continued engagement in ESG activities, emphasizing that positive results would accrue over time in line with the prepositions of stakeholder theory.

To begin with, Ghosh (2013) investigated whether firms priotising sustainability issues could also be efficient and profitable, by comparing firms listed in the newly established ESG S&P India Index against non-index firms during the period 2009-2012. The author sourced financial data such as net debt-to-equity, return on assets, leverage, Tobin’s Q ratio, and market capitalisation and employed both probit specifications and panel regressions that corrected for potential endogeneity. The study found evidence of superior financial performance for firms that demonstrated higher sustainability reporting. Additionally, the study suggested that companies characterised by large size, lower leverage, a commerce-oriented focus, higher R&D and advertisement expenditure, and operation in environmentally sensitive industries were likely to be superior in sustainability and ultimately, performance.

Dalal and Thaker (2019) investigated the same hypothesis on 65 Indian firms listed on the NSE 100 ESG index over the period 2015 -2017 and found evidence that investors preferred companies with better carbon footprints, increased societal acceptance, and transparent governance policies. The results of the random effects panel regression demonstrate a positive and significant relationship between ROA and Tobin’s Q with ESG summary scores, justifying ESG’s importance. Additionally, the variables leverage and size displayed significant but negative relationships, signalling two things (i) capital structures less dependent on debt financing signal better ESG performance and (ii) enhancing ESG performance comes at the expense of a firm size which is line with agency theory and contemporary literature, see for example (Amin and Tauseef, 2022; Bruna et al., 2022; Li et al., 2018).

Veeravel, Sadharma and Kamaiah (2023) also investigated the relationship between ESG disclosure and firm performance in India. Utilising financial data for the NSE 500 index-listed companies over the period 2010-2020, the study employs a method-of-moments quantile regression approach and finds evidence of ESG positively influencing superior firm performance. The effect of ESG on ROA is positive and seen to decrease in magnitude from 2.061 (5th quantile) to 1.189 (95th quantile), with the coefficients losing significance towards the advanced quantiles. Such a trend has been documented to exist and perpetuated among non-developed nations (Batae et al., 2020; Izcan and Bektas, 2022; Lin, Lee and Law, 2020). The fading relationship between ROA and ESG is reasonable since investors may settle for lower returns to become stakeholders in companies with higher ESG disclosure performance. Further, the ESG disclosure scores have a positive and statistically significant impact on other measures of performance such as ROE and Tobin's Q.

The non-linear relationship that supposedly exists between ESG and financial performance has been reported by a multitude of studies globally as mentioned (Bruna et al., 2022; Wu and Chang, 2022). Additionally, the idea that firms incur losses in the early stages of ESG integration before realising obvious rewards has always been a recurring theme in recent years (Eccles et al.,2013; Rossi et al., 2021; Zhou, Liu and Luo, 2022). The two revelations are both present in a study conducted by Rao et al., (2023) who utilised the quantile regression analysis on companies' part of the Nifty 50 index in India from 2015-2022 and found that at the 5th quantile level, companies with higher Social Performance Scores (SPS) exhibited lower short-term ROE. However, these same companies have the potential to establish a strong reputation for social responsibility, leading to long-term benefits. Conversely, the negative relationship between Earnings per Share (EPS) and ROE at the 5th quantile also suggests that environmentally responsible companies may experience reduced short-term profitability as is the case with Han et al., (2016) and Almeyda and Darmansyah (2019). Moreover, corporate governance practices are consistently negatively associated with ROE across multiple quantiles, indicating that companies with stronger governance structures may sacrifice short-term profitability for long-term gains and reputation.

Other researchers like Hassouna and Salen (2021) examined how the link between corporate social responsibility (CSR) and financial performance, specifically financial risk, is represented as financial leverage, operating leverage, and market risk in developing countries. Using fixed and random effects estimation models, a sample of 31 Egyptian listed companies was examined over four years, from 2011 to 2015. All the listed firms, both financial and non-financial, are sorted based on the same unified criteria set by the S&P/EGX ESG index, and the study controls for firm size measured by total assets, firm age, market-to-book value, ROA and ROE. The study found a significant relationship between adopting CSR activities and firm performance for the sample of Egyptian firms. However, the results also indicate a negative relationship between the listed companies' CSR rankings and operational leverage, yet it does not have a significant impact on financial or market risks. The disclosure of CSR practices to Egyptian stakeholders enhances awareness, thereby applying pressure on low-rated companies to enhance their CSR practices and disclosure. The paper also highlights a challenge that may exist in the adoption of CSR practices among listed firms in a developing market such as Egyptian which may be hesitant in integrating sustainable practices due to concerns over financial risk (Hassouna and Salen, 2021).

Studies conducted in the South American regions include the work of Duque-Grisales, Agruilera and Caracuel (2019) who examined the relationship between ESG and firm performance for 104 multinational companies across Brazil, Chile, Colombia and Mexico over the period 2011-2015. Their empirical results indicated that ESG scores are negatively associated with multilatinas' FP according to a random effects regression analysis. These findings could occur because costs related to the implementation of ESG initiatives are not reflected in a company's FP because these initiatives are not performed in the correct manner (Eccles et al., 2013; Franzen, 2019), or because high ESG investments by multilatinas may lead to a sacrifice of cash flow and a diversion of resources, consequently decreasing their performance (Amin and Tauseef, 2022; Dalal and Thaker, 2019; Xie et al., 2018).

The relationship between ESG and firm performance is further explored by Junius et al. (2020) who investigated firms in Indonesia, Malaysia, Singapore, and Thailand finding no statistically significant relationships when performance is measured by metrics such as ROE, ROA, Tobin's Q and price-to-earnings ratio, aligning with the findings of Duque-Grisales and Aguilera-Caracuel (2019) where ESG scores negatively impacted performance due to challenges in implementation and insufficient institutional support for sustainability initiatives. Similarly, Atan et al., (2018) examined Malaysian firms and found no significant relationship between ESG on profitability or market value but a notable significant positive influence on the cost of capital (WACC).

Aboud and Diab (2018) provided a contrasting perspective, finding that ESG index inclusion in Egypt positively influenced firm value, as firms listed on the index demonstrated higher market valuation. This is consistent with findings by Dalal and Thaker (2019) in India, where firms with better ESG performance, particularly in governance and transparency, attracted long-term investor interest and achieved improved market outcomes. The positive link between ESG and firm valuation is also echoed in the work of Zhou et al., (2022) on Chinese firms, emphasizing the role of ESG in enhancing market value, albeit with limited influence on profitability. Moreover, Makhdalena et al., (2023) analysed firms across Southeast Asia and found that all three ESG components positively influenced firm performance, with governance being the most impactful. These results highlight that higher transparency and adherence to governance frameworks significantly enhance ESG performance and firm outcomes in emerging economies.

The above literature sheds light on the relationships between ESG factors and firm performance, particularly in the context of emerging economies. Various studies have uncovered both positive (Aboud and Diab, 2018; Dalal and Thaker, 2019) and negative associations (Duque-Grisales et al., 2019; Izcan and Bektas, 2022) between ESG practices and financial metrics such as Returns on Assets (ROA) and Returns on Equity (ROE). More so, they have also revealed the heterogeneous outcomes that are prevalent because of various factors such as firm size, region of study, level of ESG integration and quality of ESG reporting over time (Lin, Lee and Law, 2020; Izcan and Bektas, 2022; Rao et al., 2023; Veeravel et al., 2023). These revelations underscore the nuanced nature of ESG integration in driving financial outcomes, with implications for companies seeking to balance short-term profitability with long-term sustainability when considering influencing factors such as regional nuances and the apparent trade-offs.

TABLE 4: SUMMARY OF LITERATURE: OTHER COUNTRIES

STUDY	REGION	SCOPE	METHODOLOGY	DEPENDENT VARIABLE	INDEPENDENT VARIABLES	CONTROL VARIABLES	KEY FINDINGS
Ghosh (2013)	India	2009-2012	Panel regression analysis	ROE ROA Tobin's Q	S&P ESG India Index Dummy variable for presence to index	Firm Size Leverage EPS Firm age DPS Profit Margin Growth of TA	Mixed: Larger firms benefit from economies of scale, allowing them to invest in sustainable practices and technologies that smaller firms might find cost-prohibitive, such as renewable energy, waste reduction, and green planning. Companies with lower leverage perform better in sustainability. Firms operating in environmentally sensitive industries tend to have superior sustainability performance.
Hafez (2015)	Egypt	2005-2013	Panel regression analysis	ROA ROE Net Int Margin	CSR performance score	Firm size EPS Loans to deposits ratio Total exp -to-total rev	Mixed: The relationship is neutral when it is looked at from the ROA measure. The banks' CSR did not have any impact on the financial performance of the banks., the relationship was positive when assessing ROE and Net Interest Margin; it implies that banks' corporate social responsibility practices do not act as costs to shareholders as they do not reduce the returns.
Dalal and Thaker (2019)	India	2015-2017	Random Effect panel data regression analysis	ROA Tobin's Q	ESG summary scores ESG pillar scores	Firm size Industry dummy	Positive: Investors prefer companies with better carbon footprints, increased societal acceptance, and transparent governance policies. Companies

STUDY	REGION	SCOPE	METHODOLOGY	DEPENDENT VARIABLE	INDEPENDENT VARIABLES	CONTROL VARIABLES	KEY FINDINGS
							with lower ESG risks have better chances of delivering sustainable financial performance and are thereby able to attract investors for longer durations.
Mansaray, Yuanyuan and Brima (2017)	Kenya, Nigeria, Morocco, Egypt and Mauritius	2005-2015	Panel regression Analysis	ROA ROE	CSR performance score	Leverage Firm size AT Interest rate	Mixed: CSR disclosure negatively affects the short-term financial performance (ROA) of firms in the mining, investment, and transport industries in Africa. In the long-term (ROE), there is a positive but not statistically significant relationship between CSR disclosure and the financial performance of African firms.
Duque-Grisales and Agruilera-Caracuel (2019)	Brazil, Chile, Colombia and México	2011-2015	Fixed Effects model Random Effects model	ROA	ESG pillar Scores ESG Summary Scores	Leverage GDP Log of Sales Country/industry dummies	Negative: ESG scores are negatively associated with the financial performance (FP) of multilatinas. Multilatinas with higher ESG scores tend to be less profitable. Costs related to ESG initiatives are not reflected in FP due to improper implementation or lack of institutional support. High investments in ESG may sacrifice cash flow and divert resources needed for operations, leading to decreased performance.
Junius, Adsurjo, Rijanto and	Indonesia, Malaysia, Singapore	2013-2017	Multiple regression analysis Random-effect model	ROE ROA Tobin’s Q ratio	ESG summary scores ESG pillar scores	Firm size Firm age Leverage Industry dummy	Insignificant: The study's findings were that ESG scores did not have a statistically significant impact on firm performance or

STUDY	REGION	SCOPE	METHODOLOGY	DEPENDENT VARIABLE	INDEPENDENT VARIABLES	CONTROL VARIABLES	KEY FINDINGS
Adelina (2020)	and Thailand			Price-earnings ratio			market value, indicating that the ESG performance metrics currently used may not be integrated into the broader performance measurement frameworks of firms in developing countries. The t-1 regression analysis indicated that the influence of ESG performance might extend beyond a one-year lag, suggesting that the benefits of ESG initiatives may take time to manifest in financial performance metrics.
Atan, Alam, Said, Zamri (2018)	Malaysia	2010-2013	OLS regressions Random and Fixed effects models	ROE Tobin's Q Weighted average cost of capital	ESG summary scores ESG pillar scores Institutional Ownership	Leverage Firm size	Insignificant: There is no significant relationship between individual and combined factors of ESG and firm profitability (i.e. ROE) as well as firm value (i.e. Tobin's Q). Moreover, individually, none of the factors of ESG is significant with the cost of capital (weighted average cost of capital, WACC), but the combined score of ESG positively and significantly influences the cost of capital (WACC) of a company.
El Khoury et al., (2021)	East Asia Emerging markets	2011 - 2017	Fixed Effects model Random Effects model	ROE ROA TSR PBV	ESG summary scores Lagged Summary scores	Firm size Leverage R&D Exp Lagged dep	Mixed: regarding ROA and ROE: There is no significant relationship with the overall ESG score. However, RET has a

STUDY	REGION	SCOPE	METHODOLOGY	DEPENDENT VARIABLE	INDEPENDENT VARIABLES	CONTROL VARIABLES	KEY FINDINGS
					ESG pillar scores	Industry dummy	concave relationship with the overall ESG score, indicating an initial positive impact but a negative at higher levels. Convex relationship with overall ESG score, suggesting positive impact only beyond a certain threshold. in the Capital Goods industry.
Hassouna and Salem (2021)	Egypt	2011-2015	Fixed and Random Effects Model	Leverage Beta	CSR Performance Index	Firm size ROA ROE Firm age Board Size MBV	Insignificant: CSR implementation was found to decrease operating leverage, indicating lower operational risk for firms engaging in CSR activities. The study found no significant relationship between CSR and financial leverage or market risk (beta coefficient). Larger firms and those with higher profitability measures (ROA and ROE) showed different levels of financial risk.
Aboud and Diab (2018)	Egypt	2007 - 2016	Univariate and multivariate analysis	Tobin's Q	ESG listing on ESG index ESG ranking on ESG index	Firm size ROA Leverage Cap Exp-to- TA	Positive: Firms listed in the ESG index in Egypt have higher firm value. There is a positive association between firms' higher rankings in the ESG index and their firm value. The introduction of the ESG index in Egypt has provided benefits to publicly traded firms, and the link between ESG and firm value will encourage

STUDY	REGION	SCOPE	METHODOLOGY	DEPENDENT VARIABLE	INDEPENDENT VARIABLES	CONTROL VARIABLES	KEY FINDINGS
							investors to push firms to improve their transparency, disclosure, sustainability and governance practices.
Kalia and Aggarwal (2022)	India	2020	Correlation and multivariate regression analysis	ROA ROE	ESG summary score ESG pillar scores	Firm size Leverage Current ratio Mkt cap PBV	Positive: Companies with high ESG scores and high individual scores (E, S, and G) demonstrated significantly higher Return on Assets (ROA) and Return on Equity (ROE) compared to companies with low ESG scores. ENV activities had a more significant positive impact on firm performance compared to social and governance activities.
Makhdalena, Zulvina, Amelia and Wicaksono (2023)	Indonesia, Malaysia, Philippines, Thailand, Vietnam	2010-2020	Multiple regression analysis	ROA Tobin's Q	ESG summary scores ESG pillar scores	Leverage Firm size GDP	Positive: It finds that all three ESG components positively influence firm performance, with GOV practices being particularly significant. The average Return on Assets (ROA) was 0.079, and the average ESG score was 44.98, indicating moderate performance. It was found that leverage and firm size negatively affected firm performance, while firm age and GDP had a positive impact.
Angela and Sari (2023)	Indonesia	2019 - 2022	OLS Linear regression	Price-to-book Value	ESG summary scores ESG Pillar scores	Firm size	Mixed: The results empirically show that ENV disclosure and SOC disclosure have no significant effect on firm value as proxied by PBV (Price to Book

STUDY	REGION	SCOPE	METHODOLOGY	DEPENDENT VARIABLE	INDEPENDENT VARIABLES	CONTROL VARIABLES	KEY FINDINGS
							Value). However, GOV disclosure affects firm value. This shows that these companies are still unable to provide all the environmental disclosure and social disclosure information needed to increase the PBV. On the other hand, GOV disclosure information can increase the price to book value.
Rao et al (2023)	India	2015 - 2022	Fixed-Effects Panel Quantile Regression analysis	ROE	ESG summary scores ESG pillar Scores	Mkt Cap Total Assets Beta Price to Cash flow per share Leverage	Mixed: Higher SPS scores are linked to lower short-term ROE, but these companies may gain long-term benefits from a strong reputation for social responsibility. Companies focusing on ENV responsibility tend to have reduced short-term profitability. There is a trade-off between governance and profitability, with stronger GOV practices potentially leading to lower short-term profitability but long-term gains and reputation.
Veeravel et al (2023)	India	2010 - 2020	Method-of-Moments Quantile Regression analysis	ROA Tobin's Q	ESG Summary scores ESG pillar Scores	Total Assets PBV Leverage RandD exp Board Size and duration	Positive: The effect of LESG on ROA is seen to decrease in magnitude from 2.061 (5th quantile) to 1.189 (95th quantile), with the coefficients losing significance towards the advanced quantiles. It is positive, but the fading relationship

STUDY	REGION	SCOPE	METHODOLOGY	DEPENDENT VARIABLE	INDEPENDENT VARIABLES	CONTROL VARIABLES	KEY FINDINGS
							between ROA and ESG is plausible since investors may require lower returns to become stakeholders in companies with higher ESG disclosure practices.
Mazzioni et al., (2024)	Brazil, Russia, India, China and South Africa	2016 - 2022	Panel data regression with Fixed effects controlled by year and economic sector	ESG summary scores ESG pillar scores	Corruption Perceptions Index (CPI) Index of Economic Freedom (IEF) UN Global Compact ESG summary scores	Firm size Leverage Revenue growth	Positive: Higher transparency (lower corruption) improves overall ESG performance, particularly in the environmental and social dimensions. A higher Index of Economic Freedom is positively associated with better governance performance. Companies adhering to the UN Global Compact show significantly better performance across all ESG dimensions. Higher leverage is associated with better ESG performance, except in the social dimension.

2.4.3. ESG and financial performance: South Africa

The following section focuses on empirical literature in South Africa and provides evidence of its impact on the aspects of financial performance for firms committed to adopting sustainable practices. The summary table (5) at the end of the section provides a compilation of articles reviewed for this section, offering more condensed insight into the ESG-firm performance literature in South Africa in the post-apartheid era.

To begin with, Chetty, Naidoo, and Seetharam (2015) assessed the short- and long-term impact of CSR and CSR announcements on the +2 days cumulative abnormal returns of firms included and excluded from the JSE SRI Index, covering the period 2004 – 2013. Their event study methodology showed that investors were not rewarded when firms entered the index, as there were no significant share price increases for these firms, except for the years 2004 and 2012 (Chetty et al., 2015). The findings for 2004 may be attributed to the short-lived enthusiasm for the launch of the index, while the significance of 2012 may lay in the growing awareness of investors due to ESG mainstreaming brought about by the Global Financial Crisis (Viviers, 2014), the Principles for Responsible Investment Committee (PRI, 2013), and the establishment of CRISA I (IoDSA, 2013; Viviers and Els, 2017). Conversely, firms that exited the Index were penalised by significant negative share price changes in 2013, illustrating a shift in investor sentiment at the turn of the decade. The long-term analysis found mixed results between CSR and Corporate Financial Performance (CFP) across different industries for both SRI constituents and non-SRI constituents, uniform with other developing countries. Similarly, in an earlier study, Gladysek and Chipeta (2012) examined the impact of firm entry inductions to the JSE SRI Index and found no significance in the average abnormal returns except for the years 2005 and 2007 respectively, owing to the same arguments.

Several researchers such as Ntoi (2010), Nkomani (2013), Van Zyl (2013), and Mitchell (2014), found statistically significant differences in market returns when comparing firms in the FTSE/JSE SRI Index to those in the FTSE/JSE All Share Index (excluding SRI firms) for the period 2004 – 2013. Additionally, financial performance measures, such as price/earnings and average price/book value ratios, also indicated significant differences between SRI firms and non-SRI firms. Ntoi (2010) further observed that SRI stocks, although exhibiting greater volatility in an era when ESG considerations were not pivotal, demonstrated greater resilience, recovering more rapidly post-recession compared to non-SRI stocks. Over a decade later, other studies such as (Muzanya, 2022; Magubane and Wesi, 2023) examining the ESG-Financial performance relationship and comparing the role of sustainable initiatives in minimising stock volatility between firms found significant positive evidence demonstrating the resilience of ESG-conscious firms in uncertain financial times such as COVID-19 in comparison to firms that were did not demonstrate exemplary amounts of non-financial disclosure.

Building on the studies that explored the role of SRI and CSR (Chetty, Naidoo and Seetharam, 2015; Nkomani, 2013; Ntoi, 2010) investigated the role of corporate social responsibility on financial performance by comparing firms listed on the JSE SRI Index to those outside the index but within the JSE top 100 companies based on firm size. Using parametric (ANOVA) and non-parametric (Kruskal-Wallis) tests, along with various accounting and market performance metrics (e.g., total share returns, P/E ratio, ROA, ROE, and net profit margins), Nkomani (2013) found that companies in the JSE SRI Index had a lower average Market to Book Value (MB), P/E ratio, and ROE compared to non-SRI companies, suggesting greater value for shareholders committed to firms outside the SRI Index. These findings align with the prevailing literature from developing countries such as South Africa, India, Brazil, Colombia and Mexico (Dalal and Thaker, 2019; Duque-Grisales et al., 2019; Kalia and Aggarwal, 2022; Viviers, 2014) which committed to integrating sustainable initiatives through their operations often incur additional costs that initially hamper financial rewards, in the hope of achieving long-term sustainability in the form of trust and loyalty, profitability, sales growth and firm size (Dalal and Thaker, 2019; Evan and Freeman, 1984; Hall, 1996; Lorenzo et al., 2009; Viviers, 2014).

Several studies, including Brammer and Pavelin (2008), Mitchell (2014) and Van Zyl (2013), emphasised the importance of socially responsible practices in achieving sustainable financial performance between 2004 and 2013. These studies converge on key outcomes: (i) companies in the JSE SRI Index produced significantly better ESG reporting than those excluded from the index; (ii) significant differences in overall ESG scores based on the industry; and (iii) the governance pillar outweighs the environmental and social pillars in driving financial performance. Empirical studies using fixed and random effects models, such as Johnson and Mans-Kemp (2019) and Muzanya (2020), confirmed a significant negative relationship between ESG and CFP, with a notably positive impact of the governance score on CFP, while the environmental and social pillars showed low, stagnant impacts despite an increasing trend from 2011-2019. Mitchell (2014) and Viviers and Els (2017) further support the notion that governance displays the highest average score across the JSE due to mandatory corporate governance reporting relative to the King III recommendations. Although the pillar's significance varies by industry, the overall trend underscores governance as the most substantial driver of performance in the South African context.

As forementioned, the picture of ESG and sustainable investment generating clear-cut advantages in South Africa is largely inconclusive. On one end, Demetriades and Auret (2014) used financial variables such as ROA, ROE, and total share returns to explore the difference between the performance of SRI portfolios and those of conventional firms outside the index. The study found evidence, although insignificant, of SRI portfolios displaying superior share returns, higher ROE performance (11.18% higher) but a ROA performance that was 1.82% lower than other conventional firms over the period

1995-2009. However, when the period was restricted between the years 2004-2009, the study found evidence of a positive relationship between SRI and ROE. Additional studies in South Africa such as (Atkins and Maroun, 2015; De Klerk and De Villiers, 2012) investigate the role of non-financial disclosure on firm financial performance. The quoted studies do not prove a causal relationship between accounting - and market-based variables with ESG but report positive correlations between the level of corporate responsibility reporting and share prices. This is consistent with even more recent South African studies (Ball, 2020; Chininga et al.,2020; Moikwatlhai, 2019; Muzanya, 2022) who find that South African firms which disclose more non-financial indicators provide superior returns over a period longer than the immediate period under study. That is, the rewards from ESG initiatives accrue over time, proving them worthwhile.

More recent studies in South Africa provide insight into the growth of ESG reporting over the past decade. For example, Chininga et al., (2020) examined the effects of ESG ratings and their dimensions on the financial performance of JSE-listed firms included on the FTSE/JSE Responsible Investment Index, covering 40 firms between 2015 and 2019. Utilising the two-stage least squares (2SLS) the study found evidence of ESG initiatives improving both accounting and market-based indicators of financial performance and more importantly environmental initiatives positively improving a firm's market performance. (Dzomonda and Fatoki, 2020; Ganda,2018; Matemane, Msomi and Ngundu, 2024) also note the increasing strength of the environmental pillar in generating positive impacts on firm performance when employing the Two-Step System GMM across 67 JSE-listed firms spanning from 2012-2022. Other papers such as (Johnson, 2019; Masongweni, 2023) further document significant positive effects relating to the social pillar to firm financial performance when examining the relationship in JSE-listed firms across the period 2010-2020.

The sentiment that firms do not realise significant financial rewards when integrating ESG considerations in the short term in South Africa is also attested to by Naik (2017) who explored the relationship between ESG disclosure and financial performance for the Top 100 JSE companies by market capitalisation over the period 2014-2017. Other financial performance measures considered included cumulative share returns and dividend returns. The study was built from the foundation of Muller and Ward's (2013) ‘style engine’ graphical time-series approach and grouped the companies into equally- weighted portfolios based on their ESG scorecard, into five quantiles. Naik (2017) found that the order of the ESG portfolio quintiles was non-linear, with the highest-ranked ESG portfolio not displaying consistent superior returns. The 4th ESG portfolio ranked first, with a compound annual return growth rate of 13.1%, followed by the 5th (9.0%), 3rd (8.0%), 2nd (3.4%) and 1st (3.2%) ESG portfolios. The results imply that the fourth-worst ESG-disclosed firms were the best performers. Other similar studies that investigate the potential non-linear relationships in developing countries (Dalal and

Thaker, 2019; Marcia et al., 2015; Rossi et al., 2021, Rao et al., 2023) demonstrate consistent patterns of Lower-rated ESG firms exhibiting greater financial performance in comparison to High-ESG firms.

Other recent studies in South Africa provide insight into the growth of ESG reporting over the past decade. For example, Chininga et al., (2020) examined the effects of ESG ratings and their dimensions on the financial performance of JSE-listed firms included on the FTSE/JSE Responsible Investment Index, covering 40 firms between 2015 and 2019. Using the two-stage least squares (2SLS) the study found evidence of ESG initiatives improving both accounting and market-based indicators of financial performance and more importantly environmental initiatives positively improving a firm's market performance. Similar discoveries are reported by Matemane, Msomi and Ngundu (2024) who also note the increasing strength of the environmental pillar in generating positive impacts on firm performance when employing the Two-Step System GMM across 67 JSE-listed firms spanning from 2012-2022. Other papers (e.g., Johnson, 2019; Masongweni, 2023) further document significant positive effects relating to the social pillar to firm financial performance when examining the relationship in JSE-listed firms across the period 2010-2020 after controlling for accounting – and market-based measures of firm performance.

The literature exploring the impacts of ESG factors on firm performance in South Africa reveals a complex and mixed relationship in both the short and long term. Studies that examined the impact of ESG-related events such as Chetty et al. (2015) and Gladysek and Chipeta (2012) found no significant share price movements for firms entering the JSE SRI Index, except in years marked by heightened ESG awareness, while firms exiting the index faced negative share price changes, reflecting shifting investor sentiments. Studies such as Demetriades and Auret (2014) and Nkomani (2013) indicated that non-SRI firms often had better performance on financial metrics, such as lower average Market to Book Value (MB) and higher ROE in comparison to firms that applied themselves in integrating sustainable frameworks in their operations, suggesting that the initial financial costs associated with ESG initiatives can deter actual firm performance. On the positive side, numerous studies do highlight the risk-reducing elements associated with ESG-compliant firms as well as an enhanced reputation, stakeholder engagement, profitability, and resilience in uncertain financial periods such as the GFC and COVID-19 (Evans, 2023, Mitchell, 2014; Muzanya, 2020; Van Zyl, 2013). In sum, this suggests that firms embarking on ESG integration face challenges in the infancy stages before realising positive spillover effects on the financial performance of firms in the long run, thus encouraging firms to proactively improve their sustainability initiatives and disclosure of non-financial information in the hope of communicating value to their various stakeholders (Chininga et al., 2020; Erasmus, 2019; Johnson and Mans-Kemp,2020; Naik, 2017).

The table below provides a more condensed look at the studies reviewed through this section of the empirical literature that have explored the ESG and financial performance nexus In South Africa. The overall findings from the literature display a negative trend in the ESG and FP relationship with many of the researchers suggesting that this is due to non-financial reporting still being in its nascent stages and firms may not show discernible financial rewards in these stages of development.

TABLE 5: SUMMARY OF LITERATURE: SOUTH AFRICA

STUDY	REGION	SCOPE	METHODOLOGY	DEPENDENT VARIABLE	INDEPENDENT VARIABLES	CONTROL VARIABLES	KEY FINDINGS
Ward and Muller (2009)	South Africa	2000-2007	Event study methodology	Abnormal returns Cumulative abnormal return	Event of BEE announcements	Mkt Cap PBV Industry dummy	Positive: BEE announcements generate positive abnormal returns, reflecting market anticipation of benefits. Positive cumulative average abnormal return of 15% following BEE announcements. - Market anticipates positive benefits from BEE transactions.
Ntoi (2010)	South Africa	2004 – 2010	Mathematical analysis Statistical analysis (t-tests, ANOVA)	TSR PBV P/E ratio	JSE SRI Index	Firm size Industry dummy	Positive: The study found observable differences between the average market returns of the FTSE/JSE SRI Index and the FTSE/JSE All Share Index, favouring the SRI Index. SRI-listed companies had higher average PBRs compared to non-SRI companies. SRI-listed companies also showed higher average PERs compared to non-SRI companies.
Esterhuysen and Ward (2011)	South Africa	2003-2009	Event study methodology	Abnormal returns Cumulative abnormal returns	Inclusion in the financial mail's 'Top 100 companies'	Mkt cap ROE EPS IRR	Mixed: New entrants to the "Top Companies" list experienced significant positive abnormal returns in the short term, peaking at 2.05% nine days after the announcement. Over 200 days, the cumulative abnormal returns for new entrants declined, ending at -0.28%, indicating that the initial positive impact was not sustained in the long term.
Ntim (2013)	South Africa	2002-2007	Sensitivity analyses, including endogeneity tests, and firm-level fixed-effects	Tobin's Q ROA Total Share returns	Integrated corporate governance (CG) index Compliance with SA reg	Total Assets PBV Leverage RandD exp	Positive: There is a statistically significant and positive association between a broad set of good corporate governance practices and the financial performance of South African listed corporations. There is a statistically significant and positive relationship between compliance with stakeholder corporate governance provisions and financial performance, in line with political cost and resource dependence theories.
Nkomani (2013)	South Africa	2002-2011	Parametric (ANOVA) and non-parametric (Kruskal-Wallis) tests	Total Return index MBV Price Earnings ratio (PE)	JSE top 100 listed companies grouped into CSR companies Non-CSR companies	- Net Profit Margin - ROA - ROE	Mixed: Companies included in the JSE's Socially Responsible Investment Index (SRII) had a lower average market-to-book value (MB) compared to non-CSR companies. The PE ratio was higher for non-CSR companies, indicating that investors were willing to pay a premium for their shares. On-CSR companies had a

STUDY	REGION	SCOPE	METHODOLOGY	DEPENDENT VARIABLE	INDEPENDENT VARIABLES	CONTROL VARIABLES	KEY FINDINGS
							higher average ROE, Companies that actively participate in BEE initiatives may face additional costs but contribute to social equity.
Mitchell (2014)	South Africa	2010-2014	Linear regression analysis ANOVA tests Correlation analysis	JSE SRI Index Nedbank Green Index FTSE4Good Index UN Global Compact Participants	ESG Summary Scores ESG pillar scores	Firm size ROE Dummy for RI indices Industry dummy	Mixed: There is a statistically significant difference between the means of the three pillars. Taking a closer look, a significant difference existed between the Governance pillar score and the Environmental and Social pillar scores. The Governance pillar score across the JSE sample was significantly higher than the mean scores for the other two pillars.
Chetty, Naidoo and Seetharam (2015)	South Africa	2004-2012	Event study methodology and regression analysis	ROE ROA EPS	JSE SRI Index JSE ALSI excluding SRI firms Index dummy	Firm size Leverage RandD intensity	Mixed: The study found that CSR announcements had a short-term impact on financial returns for firms included in or excluded from the JSE SRI Index. The market reacted positively when firms were added to the index in certain years, indicating that CSR announcements can influence share price changes. However, the overall findings suggest that CSR activities do not lead to significant differences in financial performance.
Naik (2017)	South Africa	2014-2017	Quantile Analysis The Style Engine	TSR	ESG summary scores ESG Pillar scores	JSE All Share Index ROE ROA	Negative: Portfolios with the highest ESG disclosure scores had the lowest financial performance. The fourth quintile, with lower ESG scores, showed the highest compound annual growth rate (CAGR) of 13.1%. No significant difference was found between the performance of different ESG portfolios and the market portfolio at a 5% level of significance.
Nyeadi, Ibrahim, and Sare (2018)	South Africa	2011-2013	Panel corrected standard errors	Firm size (big firms vs. others) Industry sector dummies (extractive industry vs. financial sector)	ESG summary Scores ESG Pillar Scores		Mixed: CSR has a strong positive impact on the financial performance of firms in South Africa. The positive impact is driven by the governance component of CSR, with no relationship between the social or environmental components and financial performance. The positive impact of CSR is greater for larger firms. CSR positively impacts financial performance in the extractive industry, but not in the financial sector.

STUDY	REGION	SCOPE	METHODOLOGY	DEPENDENT VARIABLE	INDEPENDENT VARIABLES	CONTROL VARIABLES	KEY FINDINGS
Ganda and Milondo zo (2018)	South Africa	2014-2015	Panel regression analysis	ROE ROI Returns on sales	Carbon Emissions level	- Firm size - Sales growth - Capital intensity - Sales growth	Mixed: Negative relationship between carbon emissions and corporate financial performance. Companies with higher carbon emissions tend to have lower financial performance indicators such as ROE, ROI, and ROS. The study differentiated between clean and dirty sectors, finding the impact of carbon emissions on financial performance varies by industry. Companies that integrate green investment initiatives designed to lower carbon emissions can manage their financial performance more effectively.
Moikwat lhai (2019)	South Africa	2012-2016	Quantitative analysis using statistical tools like IBM SPSS Statistics Version 25.0	ROA TSR	ESG summary scores ESG Pillar scores	Leverage Earnings Yield Dividend yield PBV Sales growth	Insignificant: The study found no statistically meaningful relationship between ESG reporting and the long-term oriented institutional investor base, even at the industry level. The relationship between ESG reporting and institutional investor behaviour did not vary significantly across different sectors of the JSE.
Johnson and Mans-kemp (2019)	South Africa	2011 – 2016	Pooled OLS Fixed effects model Random effects model	ROA EPS Earnings Yield TSR	ESG summary scores market cap	ROIC Mkt Cap Leverage Industry dummy	Mixed: No significant relationship was found between combined ESG and corporate financial performance (CFP) measures. The impact of ESG scores on CFP varied across different sectors, indicating that ESG aspects are not homogeneous. Low and stagnant ENV scores concerning CFP Social score displayed an increasing trend over the period. Low GOV scores had a high and positive impact on CFP but were stagnant over time. The study states that SOC and ENV scores have been major contributors to growth over the study period.
Dzomon da and Fatoki (2020)	South Africa	2011-2018	Generalised Least Squares regression model	EPS TSR	Carbon emission reduction Environmental Pillar scores	Firm size Current Ratio Leverage	Positive: ENV's sustainability commitment, including carbon emission reduction and environmental compliance, is positively related to the financial performance of firms listed on the JSE. Carbon emission reduction and environmental compliance are positively and significantly related to earnings per share and share price of firms listed on the JSE.
Chininga, Alhassan	South Africa	2015 – 2019	Two-stage least squares (2sls)	ROA ROE Tobin's q	ESG scores ESG Pillar scores	Leverage Mkt cap Firm size	Mixed: ESG initiatives improve both accounting and market-based indicators of FP. ENV initiatives improve

STUDY	REGION	SCOPE	METHODOLOGY	DEPENDENT VARIABLE	INDEPENDENT VARIABLES	CONTROL VARIABLES	KEY FINDINGS
and Zeke (2020)						Operating margin Dividend pay-out	the firm's market performance. Social and governance practices do not affect a firm's FP measures.
Mans-kemp and Van Der Lugt (2020)	South Africa	2013 – 2018	Mixed-model analysis of variance and panel regression (ANOVA tests)	ROA TSR Tobin's q MBV	ESG summary scores (Bloomberg) Irq scores from the EY excellence scoring system	-Eps -DPS -Log mkt cap -Leverage -Weighted average cost of capital	Mixed: A high level of irq is significantly associated with high levels of ESG. High irq is associated with high earnings per share and high leverage. Low-quality (progress) Reporters displayed higher levels of ROA and Tobin's Q than companies with a high level of irq. In contrast, High-quality (excellent) reporters had higher eps, DPS, TSR and debt usage in comparison to those ranked in the 'Progress' category.
Nyakurukwa and Seetharam (2022)	South Africa	2008-2020	Vector autoregression (VAR) - Impulse response function (IRF) analysis	TSR	ESG news sentiment score (positive/negative) - ESG news sentiment score lagged one period	JSE ALSI Index returns	Mixed: Significant information flow from positive ESG news sentiment to stock returns. - Stock prices react positively to positive changes in ESG news sentiment. - No significant reaction to negative ESG news sentiment. Only a minority of companies show significant information flow from negative ESG news sentiment to stock returns.
Muzanya (2022)	South Africa	2011 – 2019	Pooled OLS regression model Fixed and Random effects regression models	ROA ROE ROIC TSR	ESG summary scores ESG pillar scores	Mkt cap	Negative: There is a statistically significant negative relationship between ESG and CFP. Negative relationship between the variables of ROA and ROIC. ESG may provide superior returns over a period longer than the immediate period under study. That is, the rewards from ESG initiatives accrue over time, making them worthwhile.
Evans (2023)	South Africa	2008 - 2020	Two-way random effects panel regression analysis	Asset turnover Operating profit ROE ROA	ESG summary scores ESG pillar scores	Leverage Net profit margin Firm size	Mixed: Specific ESG sub-components like emissions, environmental innovation, working conditions, and shareholder responsibility had negative relationships with financial performance, while human rights and CSR strategy showed positive relationships.
Matemane, Nsomi and Ngundu (2024)	South Africa	2012-2022	Two-step system GMM	ROA	ESG summary Scores ESG Pillar Scores	- Leverage - Firm size	Positive: Past financial performance (lagged ROA) has a strong positive influence on current ROA. Governance performance has a positive and significant impact on ROA, while environmental and social performance metrics do not have a significant impact. Higher leverage

STUDY	REGION	SCOPE	METHODOLOGY	DEPENDENT VARIABLE	INDEPENDENT VARIABLES	CONTROL VARIABLES	KEY FINDINGS
							and larger firm size are positively associated with higher ROA.
Masongweni and Simo-Kengne (2024)	South Africa	2015-2020	Pooled OLS Fixed and random effects GMM	Tobin's Q ROE ROA	ESG Summary Score ESG Pillar Scores	- Leverage - Firm size - Industry dummy	Mixed: Overall ESG score does not significantly affect financial performance. - Social and governance pillar scores show a positive association with firm performance.

2.5. Chapter Summary

With many studies focused on ESG and firm performance in developed markets, a positive relationship is observed more often than is the case with emerging countries. Likewise, studies examining the impact of ESG disclosure in emerging countries find some evidence of positive relationships, although often insignificant. Aside from the significance of the empirical evidence, a vast majority of the research on both developed and emerging economies assumes this association to be homogenous for all firms, often employing linear models of analysis. While not as extensive as the work conducted in developed countries, the literature on the relationship in South Africa is still growing, with the current studies reviewed offering inconclusive results of the nature of the relationship. Notably, existing research in South Africa has often overlooked how firm and industry characteristics impact the aspects that ESG firms proactively work on and disclose.

This study proposes that the influence of ESG on a firm's financial performance exhibits a conditional distribution across firms with different characteristics within the economy to provide a more nuanced understanding than traditional linear models, motivating the use case for the quantile regression model for this study.

CHAPTER THREE

OVERVIEW OF ESG ADOPTION IN SOUTH AFRICA

3.1. Introduction

Following the previous chapter, this chapter is organised as follows: (i) It provides a context on the background of ESG developments in South Africa. (ii) It reviews the growth and evolution of Environmental, Social and Governance (ESG) practices in South Africa, including the rise of sustainable financial instruments and key market benchmarks. (iii) It discusses regulatory developments, policy frameworks, and significant events that have shaped the adoption of responsible investment (RI) practices in the country. (iv) Finally, it outlines domestic corporate reporting initiatives that support ESG integration among listed firms.

3.2. Background on ESG Developments in South Africa

In recent decades South Africa has emerged as a key player in the global landscape of corporate sustainability and ESG practices. During the early 1990s, South Africa underwent a profound transformation with the dismantling of the apartheid regime and the subsequent transition to popular democracy, opening new avenues for economic growth and social progress. The mid-to-late -1990s witnessed key events such as the publication of the King Report on Corporate Governance (1994), The Bill of Rights (1994), the Reconstruction and Development Programme Act (1994), The Growth, Employment and Redistribution Act (1996) and the Asian Financial Crisis of 1997/98, were pivotal events , as all highlighted the need for greater transparency, accountability and ethical conduct. ESG, previously considered peripheral, has gradually gained prominence globally as corporations, investors, and policymakers alike acknowledged that financial success could no longer be divorced from ethical considerations (Atkins and Maroun, 201:214).

Despite the progress, the evolution and integration of responsible investing as a staple for firms has encountered resistance from both global and local developments, as well as from certain segments of the population. These include short-term focused investors who prioritise immediate financial returns over sustainability goals, and the financial service providers who cater for these investors' needs. This resistance highlights the delicate balance needed between profit motives and societal well-being that remains prevalent (Dube, 2020:25; Worthington-Smith, 2019:86).

Table 6: Summary of ESG Developments in South Africa, 1992 – 2024

EVENT	YEAR	IMPACT ON RI MARKET	SCOPE
Launch of the 'Responsible Investment' Fund	1992	Positive	Local
Publication of the King Report on Corporate Governance	1994	Positive	Local
The Reconstruction and Development Program	1996	Positive	Local
Asian Financial Crisis	1997/98	Negative	International
The World Summit on Sustainable Development held in Johannesburg	2002	Positive	International
Publication of the Second King Report on corporate governance (King II)	2002	Positive	Local
Launch of the Financial Sector Charter	2002	Positive	Local
Promulgation of the B-BBEE Act (No. 53 of 2003)	2003	Positive	Local
Launch of the JSE SRI index	2004	Inconclusive	Local
SA Social Investment Exchange (SASIX)	2006	Positive	Local
Launch of the UN Principles for Responsible Investment (PRI)	2006	Inconclusive	International
Launch of the FTSE/JSE Shari'ah All Index	2007	Positive	Local
South African Network for Impact Investing	2008	Positive	Local
Launch of the FTSE/JSE Shari'ah Top 40 Index	2008	Positive	Local
Global Financial Crisis	2008/09	Negative	International

King III Report on Corporate Governance	2009	Positive	Local
Introduction of the New Growth Path	2009	Positive	Local
The British Petroleum (BP) Oil spill in the Gulf of Mexico	2010	Positive	International
The UN Convention on Climate Change held in Durban	2011	Positive	International
Amendment to Regulation 28 of The Pension Funds Act	2011	Positive	Local
Code for Responsible Investing in South Africa (CRISA)	2011	Positive	Local
The Principle of Responsible Investment (PRI)	2013	Positive	Local
Sustainability Development Goals (SDGs)	2015	Positive	International
FTSE/JSE Responsible Investment Index	2015	Positive	Local
Global Reporting Initiative	2016	Positive	Local
COVID -19	2019	Negative	International
CRISA 2	2022	Inconclusive	Local
Green Finance Taxonomy	2022	Positive	Local
JSE Sustainability Disclosure Guidance And Climate Disclosure Guidance	2022	Positive	Local
Climate Change Bill	*2024*	Positive	Local

3.3. Growth in Sustainable Financial Instruments

Following his appointment as director at General Motors in 1971, Dr. Leon Sullivan became the driving force behind the anti-apartheid divestment movements across America, Canada, Europe, the United Kingdom and Japan. He formulated the Sullivan Principles which became a code of conduct for banks and businesses with operations in South Africa (Ntoi, 2010:35). Institutional investors who supported the principles began to exclude banks and companies that were not compliant with the code from their portfolios and this social movement served as a blueprint for how investors could harness their collective power to ensure social justice (Heese, 2005:730).

The establishment of the first RI fund in South Africa, the Community Growth Equity Fund in 1992, was a direct response to the collective efforts of anti-apartheid movements and local trade unions. The fund, backed by Unity Incorporation and Old Mutual, prohibited investments in firms in support of the apartheid regime or known for having poor labour practices (Viviers and Els, 2017:136). It represented a new era of 'impact investing,' focused on using capital to address social injustices. This was a starting point for the growth of RI funds in South Africa, characterised by mandates that prioritised infrastructure development, job creation, B-BBEE initiatives, and skills development (Viviers and Els, 2017:136).

Between 1992 and 1998, South Africa witnessed the launch of 18 RI funds, many of which adhered to an impact investing strategy. A key player during this phase was Futuregrowth Asset Management, which pioneered the RI landscape by introducing five funds (Viviers, Bosch, Smit and Buijs, 2008:8; Viviers and Els, 2017:136). Notably, the Futuregrowth Community Fund invested in township and urban area shopping centres, contributing to economic empowerment. The subsequent periods saw fluctuations in the RI market's trajectory, with the Asian Financial Crisis (1997-1998) bringing about varying economic challenges that slowed down momentum, with many responsible investment funds struggling to sustain performance (De Beer,2015:21). The following decade saw a resurgence in responsible investment with the developments in the market culminating in the launch of the continent – and the JSE's first Socially Responsible Index in 2004 which aimed to represent companies that integrated the principles of the triple bottom line and good governance into their business activities (JSE SRI Index, 2014:2). At the time, market observers claimed that the index would accelerate the adoption of more responsible business practices, with 51 companies qualifying as part of the first round of voluntary screening in 2004. Over time, the constituents of the index grew, and by 2014, a record number of 156 companies were reviewed, and 82 were constituents of the index (Crotty, 2013b:2).

After 2000, South Africa saw a steady growth of RI funds, building on the foundation laid in the 1990s. Funds such as Futuregrowth's infrastructure-focused products and the PIC's Isibaya Fund gained traction, targeting renewable energy, affordable housing, and economic empowerment (International Financial Corporation, 2011:45; Viviers and Els, 2017:139). The introduction of the UN's Principles for Responsible Investment (PRI) in 2006 marked a global shift, steering RI strategies toward explicitly integrating ESG principles. This framework elevated South African RI efforts from broad sustainability actions to more focused, measurable ESG-driven investment approaches, aligning with the best global practices. In addition, the SA Social Investment Exchange (SASIX) of 2006 was introduced by the Greater Good South African Trust to promote investments in sustainable activities (SA Social Investment Exchange,2007:2). The Act led to the establishment of an online exchange to match donor funding towards high-performance development projects, give philanthropists a centralised way of tracking the effective use of their donations. This online platform was only the second of its kind globally following the Social Stock Exchange launched in Brazil in 2003 and significantly impacted the investment landscape in South Africa (SA Social Investment Exchange, 2007:3).

The optimism and spread of responsible investment grew over the next few years culminating in the JSE launching the FTSE/JSE Shari'ah All Share Index in 2007 and the FTSE/JSE Shari'ah Top 40 Index in 2008 in response to a growing interest in Islamic financing globally. The two Shari'ah indices comply with the Shariah principles as a core component of the Islamic system. The Shari'ah principles excluded companies involved in non-Islamic finance, alcohol, non-halal food production, tobacco and weapons as criteria for forming an index that would represent a commitment to responsible and sustainable investment (Viviers and Els, 2017:129). During this time, RI funds continued to be introduced, indicating South Africa's active engagement in integrating sustainable practices and ESG considerations into its investment landscape.

Table 7: Ri Funds Established and Discontinued in South Africa (June 2012 - 31 December 2019)

Active Funds	**Equity**	**Asset Allocation / Balanced**	**Fixed Interest**	**Alternative / Private Equity**	**Property**	**Total per RI Strategy**
Ethical exclusions (a)	7	3	-	1	-	11
Positive screening (b)	3	-	1	-	-	4
Impact investing (c)	1	2	-	3	1	9
Shareholder activism (d)	-	2	-	1	-	3
Positive screening and shareholder activism	3	-	-	-	-	3
Positive screening and impact investing	3	-	1	2	1	7
Positive screening, shareholder activism and impact investing	1	-	-	2	-	3
Positive screening, ethical exclusions and impact investing	1	-	-	-	-	1
Ethical exclusions and shareholder activism	-	1	-	-	-	1
Total Active Funds	16	9	6	9	1	41

Source: Viviers and Els (2017)

3.4. Growth in Ri Funds

The table above outlines the responsible investment (RI) funds introduced and discontinued in South Africa between June 2012 and December 2019, highlighting the diversity of investment strategies employed during this period, showing how the RI landscape evolved with an increasing emphasis on integrating environmental, social, and governance (ESG) considerations. Between 2012 and 2019, South Africa saw significant growth in responsible investment (RI) funds, with 41 active funds introduced. Key strategies included ethical exclusions (11 funds), focusing on avoiding companies involved in harmful industries, and positive screening (4 funds), which selected firms excelling in ESG factors. The rise of impact investing (9 funds) marked a shift toward funds aimed at achieving tangible social and environmental outcomes alongside financial returns. The increased focus on shareholder activism (3 funds) also shows investors' growing interest in engaging with companies to improve their ESG practices. Overall, ESG considerations evolved from simple exclusions to proactive, dynamic strategies, reflecting a global trend towards sustainable investing. Investors sought not only to avoid unethical companies but to actively shape corporate behaviour.

The developments in these aspects with the growth in indices and funds introduced over time served as performance benchmarks used by many investors in constructing their investment plans (FTSE/JSE Africa Index Series, 2013:14). It could be argued that the improving sentiment and activity with the growing number of indices and RI funds contributed to their growing popularity and subsequent considerations for responsible investment practice. Greater evidence stems from the fact that several funds, including those managed by Element Investment Managers, had been awarded the ACI/Personal Finance Raging Bull Awards based on outstanding three-year risk-adjusted performance in 2013 (Viviers and Els, 2017:130).

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Finance Raging Bull Awards based on outstanding three-year risk-adjusted performance in 2013 (Viviers and Els, 2017:130).

3.5. Regulatory Developments

The evolution of responsible investment (RI) funds and sustainability indices witnessed in South Africa was significantly influenced by a broader framework of legal, social, and economic reforms. In 1994, the Reconstruction and Development Programme (RDP) was introduced by the newly formed government to address the inequalities of the past, focusing on poverty eradication, economic growth, and the democratisation of society. Key initiatives included providing housing, healthcare, education, and job creation through public works and infrastructure development, which laid the foundation for sustainable development in the country. The King I Report on Corporate Governance (1994) followed closely, providing a voluntary framework for corporate conduct. This non-binding code emphasised the importance of ethical leadership, sustainability, and good corporate citizenship, encouraging businesses to adopt more responsible governance practices. Following these developments, the King II Report further built on these foundations by introducing mechanisms for shareholder activism and ordering non-financial disclosures from firms seeking to be listed on the JSE. These principles were later embedded in the Companies Act (2008). Meanwhile, the Bill of Rights in South Africa's Constitution (1996) further strengthened the nation's commitment to social and environmental justice. Elevating fundamental human rights, the Bill of Rights guaranteed access to key resources such as housing, healthcare, and education, while also emphasising the right to a healthy environment. These legal frameworks ensured that businesses were not only accountable for their financial performance but also for their social and governing impacts, reinforcing the country’s broader development goal at the time.

Other notable developments that shaped the direction of responsible investments globally and South Africa, in particular, include the World Summit on Sustainable Development (2002) in Johannesburg which raised awareness on issues such as poverty, corruption, and health crises like HIV/AIDS, malaria, and tuberculosis. The summit also provided frameworks to guide nations in aligning their economic practices with sustainable development goals. The UN Principles for Responsible Investment (PRI) launched in 2006 provided a voluntary framework for institutional investors to incorporate ESG factors into their decision-making and act in the long-term interests of their beneficiaries while addressing these ESG issues. Notably, the Government Employees Pension Fund (GEPF) became a founding PRI signatory, helping shape South Africa’s corporate investment landscape. Further developments in the field led to the establishment of the Financial Sector Charter (2002), supporting empowerment financing in sectors like housing and small enterprises, creating a more inclusive business environment. The Charter culminated in the promulgation of the B-BBEE Act (2003), which focused on broad-based black empowerment in ownership, management, and skills development. Together, these initiatives aimed to foster economic growth, address historical inequities, and transform South Africa's economic landscape through collaboration between government, business, and labour.

3.6. Global and Local Events Shaping RI

The growth in responsible investment and the subsequent emergence of ESG considerations has further been justified and gained the attention of a broader audience with detrimental global events such as the Global Financial Crisis (2008), The British Petroleum (BP) Oil spill in the Gulf of Mexico (2010), The UN convention on Climate Change held in Durban (2011) and the coronavirus pandemic (2019). Growing optimism in the adoption of responsible investment principles was quickly derailed by the Global Financial Crisis of 2008. Triggered by the collapse of the United States housing market, the crisis manifested as a severe contraction of liquidity in global financial markets (Rena, 2014:1). For sub-Saharan Africa (SSA) and in particular South-Africa, the mode of transmission of the impact was mainly through significant disruption of capital flows and real investment, declining commodity export prices and a reduction in the volume of exports (Viviers, 2014:743). The South African economy went into recession in 2008/09 for the first time in two decades and employment dropped by a million jobs from the end of 2008 to the middle of 2010. As a result, the employment ratio fell back from 45% in 2008 to 41% in 2010 (Koma, 2013:155). The investor sentiment over the period saw a major shift as investors sought more responsible institutions to invest in to mitigate some of the impact of unforeseen circumstances (Cameron, 2011; Peacock, 2011; Swart, 2011). A stark return to infrastructural development and the emphasis on B-BBEE financing was realised during this period, promoted by the New Growth Path of 2010 released by the Minister of Economic Development (Komo, 2013:155). The policy was underpinned by an emphasis on employment opportunities, labour relations, rural development, science and mining, tourism, social development, and corporate sustainability (Komo, 2013:155). The policy framework drew from the binding growth constraints identified by the 'Accelerated and Shared Growth Initiative for South Africa' (ASGISA) of 2006 as key reasons for the underwhelming growth in South Africa. These constraints include the following: the relative volatility of the currency; the cost, efficiency and capacity of the national logistics system; shortages of suitably skilled labour; the spatial distortions of apartheid, which affected low skilled labour costs; barriers to entry; limits to competition and limited new investment opportunities; the regulatory environment and the burden on small and medium enterprises; deficiencies in the state organisation, capacity and leadership (ASGISA Annual Report, 2006:5). Overall, maximising the growth potential of South Africa by addressing the dimensions of sustainability as it relates to ESG practises is expected to yield more employment, especially in the private sector (New Growth Path, 2010:5). The Covid-19 pandemic trigged a global economic crisis that impacted the global financial market in an unprecedented way. The levels of uncertainty and panic led to significant volatility in the stock prices on the JSE, however, numerous scholars and economists (e.g., Amosh and Khatib, 2023; Iikova, 2023;Tampakoudis, Noulas, Kiosses and Drogalas, 2021; Usher, 2023) found supporting evidence that the potential, risk-reducing benefits that ESG-integrated firms exhibited. For instance, Engelhardt, Ekkenga and Posch (2021:8) found that firms with high ESG scores outperformed their counterparts in terms of lower stock price decline. The resilience of these firms is precisely why global leaders have emphasised the integrated approach to ESG over the last few decades.

3.7. Domestic Reporting Initiatives

Domestically, several acts, codes, and conduct have been passed on to guide institutional investors and firms to further streamline the integration of ESG principles in the investment landscape since the financial crisis of 2008. In addition to the King I - and King II Reports on corporate governance of 1994 and 2002, the King III report was convened in 2009 and introduced a wider scope to corporate governance to include topics such as shareholder approval of non-executive directors' remuneration and the evaluation of performance as it relates to the board and directors. The report goes a step further than its predecessor by recommending that all public, private and non-profit firms present integrated annual reports based on the sustainability guidelines of the Global Reporting Initiative (IoDSA, 2013; JSE, 2013; Mitchell, 2014). The JSE was proactive in ensuring these changes and obligated listed companies to comply with King III's recommendations. The King IV Report of 2016 is the current instalment of the guidelines and is structured around 17 principles applicable to all organisations, focusing on ethical leadership, organisational ethics, corporate citizenship, strategy and performance, reporting, primary roles and responsibilities of the governing body, and stakeholder relationships (King IV, 2016; Ojala, 2019). These principles underpin the importance of an integrated approach to governance, considering economic, social, and environmental impacts. Additionally, King IV also suggests ways in which companies should be reporting on ESG in their financial statements such that an investor will be able to understand the company's future sustainability practices (Killian, 2021; King IV, 2016). Finally, King IV also recommends continuous monitoring of ESG as well as considering how additional industry codes, legislation, and/or global developments should influence ESG reporting in company financial statements.

According to the Institute of Directors in South Africa (2011:4) after the publication of the King III report in 2009, a recommendation was made that a separate report should be released focusing on the expectations of institutional investors. The Code for Responsible Investing in South Africa (CRISA) was released in 2011 to guide institutional investors on how to perform investment analysis and activities effectively. The CRISA was based on six principles promoting the integration of ESG factors in investment and ownership practices. Although compliance with the code was voluntary, the former Minister of Finance, Pravin Gordhan, supported the codes of conduct (CRISA) and hinted that the state would take an active role in promoting ESG and its principal components if the integration was proven slow and ineffective. The code highlights that it is no longer appropriate for institutional investors to focus narrowly on the monetary benefits to beneficiaries. Attention should also be given to ESG aspects that could have an impact on long-term sustainability and value creation (IoDSA, 2011:2). Following the pandemic, it was crucial to enhance the resilience of the financial system in ways that increase the robustness of the market and mitigate the effects of future events. The CRISA 2 of 2022 built on the foundational principles established by CRISA 1 (2011) to further incorporate ESG issues into investment practices. By incorporating the lessons learned from the pandemic, the code introduced more stringent guidelines for ESG integration, emphasizing transparency, accountability, and sustainability in investment decisions. According to Magubane and Wesi (2023:302), the enhancements provide institutional investors with guidelines to manage systemic risk and opportunities presented by global crises such as pandemics and climate change. The revision of the CRISA aligns the emphasis and importance of corporate governance and social responsibility with international best practices, which enhances the confidence amongst local investors (CRISA II, 2022:3).

Secondly, in the aftermath of the pandemic, a shift in focus towards climate change has been observed and the government passed the Climate Change Bill in 2024. The Climate Change Bill is legislation that seeks to enable the development of an effective climate change response and a long-term transition to a low-carbon and climate-resilient economy and society in South Africa (The Energy Council of South Africa, 2024). The Bill aims to play a key role in the global effort to reduce the emission of greenhouse gases and the preservation of the environment for the benefit of the current and future generations of the country. The Climate Change Bill proposes the establishment of an expert scientific body. This body would provide independent advice to policymakers, drawing from the most current scientific knowledge relevant to climate change in South Africa. Additionally, it would consider socioeconomic development and address issues related to poverty and inequality (UCT and ACDI, 2022:4).

Furthermore, considering the perpetual evolution of sustainable initiatives and the recent increase in climate-related issues, the JSE developed the Sustainability Disclosure Guidance and Climate Change Guidance specifically tailored for the South African context (JSE, 2024:2). The guide aims to assist companies in navigating the areas of sustainable reporting and disclosure in more meaningful and confident ways. The JSE SDG draws from the principles of the most impactful global initiatives such as the GRI Sustainability Reporting Standards, the Taskforce on Climate-related Financial Disclosures (TCFD), and the PRI to mention a few. While primarily intended to aid JSE-listed companies, the guides offer incredible value to institutional investors as well as stakeholder groups with a vested interest in the degree of commitment to ESG integration and disclosure, on top of the level of performance of companies.

Overall, the last two decades have witnessed South Africa undergo a stark transformation in its approach to investing. What initially began as Responsible Investing (RI) centred around the exclusion of certain sectors and companies in response to the apartheid regime, has culminated in a worldwide shift to ESG integration as institutional investors and various stakeholders actively manage ESG factors as a cornerstone to investment strategies. Notably, the UN Global Compact's 2004 report introduced the concept of ESG, emphasizing its relevance beyond financial metrics. Legal recognition followed, reinforcing investors' duty to consider the long-term material gains of responsible investing. Establishing the Principles for Responsible Investment (PRI) further solidified ESG's importance, helping it evolve into a fundamental component of all value-based investing globally, and in South Africa.

3.8. Conclusions on ESG Adoption In South Africa

South Africa has seen remarkable progress in adopting ESG principles over the past few decades, evolving from ethical exclusions during the apartheid era to comprehensive ESG integration in modern investment strategies from both the public and institutional investors. Landmark initiatives like the King Reports on Corporate Governance, the establishment of the JSE SRI Index and the implementation of CRISA have all been important in embedding sustainability into corporate practices. Global events like the UN Principles for Responsible Investment and local developments, including the climate change Bill and the JSE Sustainability Disclosure Guidance have further solidified South Africa's role in sustainable investing, despite challenges such as several financial crises and the COVID–19 pandemic, ESG practices have been seen to be resilient and proven central in creating long-term value.

CHAPTER FOUR

DATA AND METHODOLOGY

4.1. Introduction

The main aim of this study was to investigate the relationship between ESG disclosure and firm financial performance for South African firms listed on the JSE. Accordingly, this chapter outlines the economic and analytical frameworks that were used to achieve this objective. To conduct the analysis, the study employed a combination of linear and non-linear econometric models. Specifically, Fixed Effects (FE) and Random Effects (RE) models were used to estimate average effects across firms, while Panel Quantile Regression (PQR) was applied to capture the heterogeneous effects of ESG across the distribution of firm performance.

Three sets of variables were required for the analysis—those measuring (i) firm financial performance, (ii) ESG disclosure, and (iii) relevant control variables.

4.2. Measures of Firm Performance

Consistent with the practice in much of the contemporary empirical literature, this study uses two market–based and one accounting-based measure of firm performance (Almeyda and Darmansyah, 2019; Eccles, Ioannou and Sarafeim, 2013; Quereshi et al., 2021; Veeravel et al., 2023). Each of the dependent variables is expanded on below.

Market Capitalisation

Market capitalisation, defined as the total market value of a firm's outstanding shares, is an indicator of firm size and stability. It is measured by multiplying a company's stock price by its total number of outstanding shares (Ball, 2020:37). Larger firms tend to have more resources to implement ESG initiatives, establishing a cycle where decent ESG performance communicates value to investors, thereby fostering a positive association with performance (Maji and Lohia, 2022:4).

Tobin's Q

Tobin's Q is defined as the ratio of a firm's market value to the replacement cost of its assets (Nekhili, Boukadhaba and Nagati, 2019:140). This ratio is widely used as a proxy for growth opportunities and the market's expectations of a firm's profitability (Dalal and Thaker, 2019:5). Firms with higher Tobin's

Q are seen as having stronger intangible assets (such as good reputation or image) and we can expect greater ESG disclosure to positively affect performance (Nekhili et al., 2019:148).

Returns on Equity

Additionally, ROE is an accounting-based measure of profitability relative to shareholder's equity, it is measured by dividing net income by the total shareholder equity (Hassouna and Salem, 2021:78). It is perceived as an indication of a firm's efficiency in generating profits from its assets (Nkomani, 2013:6). Firms with higher ROE are generally more profitable and stands as an indication of management's effectiveness.

4.3. Measures of ESG Disclosure

ESG combined – and Pillar scores (±)

The study examines each ESG component independently to avoid possible collinearity concerns, consistent with their application in contemporary literature (Han, Kim and Yu, 2016; Rao et al., 2023 Rossi et al., 2021). The combined ESG score provides an aggregate measure of a firm's sustainability commitment. While the expected effect is generally to enhance performance by attracting socially conscious investors and reducing risk, the empirical findings detect a more ambiguous effect on firm performance (Kim and Li, 2022:1). This ambiguity is an outcome of differing theoretical perspectives and empirical findings which suggests that ESG activities may either contribute to improvements in performance or impose additional costs on operations depending on many contextual factors such as industry characteristics, firm-specific factors, geographic and institutional dynamics.

Environmental Pillar (±)

The expected effect the Environmental pillar (ENV) captures a firm's efforts towards environmental responsibility, such as waste reduction, energy efficiency and climate risk management (Dalal and Thaker, 2019:2). While ENV initiatives can attract investors and reduce regulatory risk, thereby potentially boosting firm performance, the cost of implementation may reduce profitability in firm's performance metrics such as retained earnings and dividend pay-outs particularly in the short term (Duque-Grisales and Caracuel, 2019:318).

Social Pillar (±)

The Social pillar (SOC) reflects a firm's attention to social welfare such as employee treatment, community engagement and customer relations. Empirical evidence suggests a mixed effect on firm performance with the costs of implementation perceived to constrain firm profitability. On the other hand, these efforts can improve consumer trust, brand loyalty and long-term stakeholder relationships, potentially enhancing performance over time (Lupu, Hurduzeu and Radu, 2022:2).

Governance Pillar (+)

Finally, the Governance score (GOV) measures aspects such as transparency, board independence, and ethical standards, with empirical evidence showing that robust governance improves performance by reducing agency costs and strengthening investor confidence. This is especially relevant in markets like South Africa where governance standards are closely scrutinised, and strong governance practices can significantly enhance firm performance (Eccles and Sarafeim, 2013:6).

4.4. Control Variables

Total Assets (+)

Total assets reflect the scale and resources of a firm (Velte, 2017:173). Commonly referred to as 'firm size' in contemporary literature, total assets are a significant determinant of firm performance. Larger firms, with greater resources, may benefit from economies of scale, enhanced market power, and superior access to financing, enabling them to achieve better financial outcomes compared to smaller firms (Velte, 2017:173).

Price-to-Book Value (±)

Price-to-book value (PBV) compares a firm's market value to its book value, offering insight into how the market perceives the firm's value relative to its accounting valuation (Angel and Sari, 2023:426). A higher PBV ratio indicates that investors are confident in the firm's ability to generate superior returns which can positively impact firm performance. Firms with higher PBV ratios are portrayed to have strong growth prospects and efficient resource allocation which can result in enhanced financial returns (Nkomani, 2013:26). Conversely, a low PBV may signal a market concern about the firm's future profitability and inefficient resource allocation, thus negatively affecting a firm's ability to attract investors, further constraining their performance.

Earnings Per Share (+)

EPS measures a firm's profitability by illustrating a firm's ability to generate income for shareholders. It is the ratio of net income available for common shareholders divided by the weighted average shares outstanding (Mans-Kemp and Van Der Lugt, 2020:4). Higher EPS is generally seen as a positive indicator of firm performance, and firms with strong EPS may experience enhanced outcomes from

ESG initiatives, as profitability can support sustained commitment to responsible practices without straining financial resources.

COVID – 19 Dummy Variable (±)

The COVID-19 dummy variable accounts for the unique economic impacts that the pandemic had on financial markets globally, and South Africa in this context, from 2020 to 2022. COVID-19 introduced financial strains, affecting ESG investments as firms prioritised liquidity (Muzanya, 2022:12). These variable attempts to capture pandemic-driven shifts in performance, with some firms benefiting from shifts in operations and others facing profitability declines, depending on their sector and business practices during this period.

TABLE 8: LIST OF VARIABLES FOR STUDY

SYMBOL	VARIABLES	VARIABLE DEFINITIONS
ESG	Summary ESG scores	Overall score for the ESG disclosure metrics
E, S, G - Pillar scores	Ind. ESG Pillar scores	Individual scores for each pillar of ESG disclosure
LGMCAP	Market Capitalisation	Commonly used as a metric to assess the size and relative value of a company.
LGTA	Total Assets	Represents the scale of a company's operations and its financial resources
PBV	Price to Book Value	Price of a common stock divided by its book value as at the year-end
PRICE	Stock Price	Measure's year-on-year observation of the stock price of a firm
ROE	Return on Equity	Measures a company's financial performance and effectiveness in using shareholder equity
EPS	Earnings Per Share	Analyses a company's commitment to environmental sustainability and risk management

4.5. Data and Sources

The LSEG Refinitiv Database (Refinitv, 2021) offers one of the most comprehensive ESG databases in the industry, covering over 90% of the global market cap, across more than 630 ESG metrics, with history dating back to 2002. ESG scores from LSEG are designed to measure the relative ESG performance, commitment and effectiveness of a company, transparently and objectively, based on company-reported data. This covers 10 main themes including emissions, environmental product innovation, human rights, shareholders and so on. Scores are available on over 15,500 public and private companies globally, with time series data going back to 2002 (Refinitiv, 2021).

This paper analyses the performance of JSE-listed companies that have comprehensive ESG disclosure data between 2012 – 2023. The firms were selected based on the following criteria: (1) being listed on the JSE and maintaining ESG data across the period of study; (2) having comprehensive financial performance data for the period for key variables; and (3) possessing data for all variables.

Annual data were collected from the LSEG Refinitiv database for the financial and ESG disclosure information for 28 JSE-listed companies, adding up to a total of 336 observations. The variables are listed and defined in Table (7) above. The next section presents the estimation techniques.

4.6. Model Specifications and Econometric Procedure

i) MODEL SPECIFICATION

The economic model for the ESG-firm performance relationship draws on stakeholder theory and agency cost theory, reflecting opposing perspectives on how ESG influences firm performance. Stakeholder theory suggests that ESG activities enhance stakeholder relationships, improve competitiveness, and drive financial performance by building trust and reducing risks (Masongweni, 2024:150). Conversely, agency cost theory highlights potential downsides, as ESG initiatives might increase costs or reflect managerial self-interest, potentially reducing profitability (Chininga et al., 2020:3). The relationship is further shaped by factors such as industry characteristics, regulatory environments, governance structures, and the type of performance measures used (e.g., accounting-based or market-based metrics).

The first equation (1) represents the ESG-firm performance relationship advocated by the stakeholder theory, suggesting that ESG initiatives positively impact firm performance. On the other hand, model (2) is in line with agency cost theory which implies that ESG initiatives could represent an additional cost to a firm's operations, thus deterring performance.

$$FP_{it} = \beta_0 + \beta_1 ESG_{it} + \sum_{j=1}^{n} CONTROLS_{jit} + \varepsilon_{it} \qquad (1)$$

$$FP_{it} = \beta_0 - \beta_1 ESG_{it} + \sum_{j=1}^{n} CONTROLS_{jit} + \varepsilon_{it} \qquad (2)$$

Where:

FP_{it} : Firm performance (e.g. Returns on Equity, Tobin's Q and Market Capitalisation)
ESG_{it}: Overall ESG disclosure scores
$CONTROLS_{jit}$: Control variables that influence firm performance, including:

- Total Assets, Earnings per Share, Stock Price, Price-Book-Value and Leverage

To ensure a better understanding of the effect that each element of ESG has on firm performance, we disaggregate the pillars and estimate separate models for each. Below are equations (3) – (6) of the economic model. Here, the combined ESG score and its individual pillars – ESG: Environmental (ENV), Social (SOC), and Governance (GOV) – are estimated separately.

In addition, each of the four equations is expanded to explore the individual effects of two important control variables – Share Prices (PRICE) and Price-to-Book-Value (PBV) – as well as the role of the COVID-19 pandemic in potentially affecting the ESG-firm performance dynamic.

$$FP_{it} = \beta_0 + \beta_1 ESG_{it} + CONTROLS_{it} + \varepsilon_{it} \quad \textbf{(3)}$$

$$FP_{it} = \beta_0 + \beta_1 ENV_{it} + CONTROLS_{it} + \varepsilon_{it} \quad \textbf{(4)}$$

$$FP_{it} = \beta_0 + \beta_1 SOC_{it} + CONTROLS_{it} + \varepsilon_{it} \quad \textbf{(5)}$$

$$FP_{it} = \beta_0 + \beta_1 GOV_{it} + CONTROLS_{it} + \varepsilon_{it} \quad \textbf{(6)}$$

$$FP_{it} = \beta_0 + \beta_1 X_{it} + \beta_2 PRICE_{it} + \beta_3 COVID_{it} + \varepsilon_{it} \quad \textbf{(i)}$$

$$FP_{it} = \beta_0 + \beta_1 X_{it} + \beta_2 PRICE_{it} + \varepsilon_{it} \quad \textbf{(ii)}$$

$$FP_{it} = \beta_0 + \beta_1 X_{it} + \beta_2 PBV_{it} + \beta_3 COVID_{it} + \varepsilon_{it} \quad \textbf{(iii)}$$

$$FP_{it} = \beta_0 + \beta_1 X_{it} + \beta_2 PBV_{it} + \varepsilon_{it} \quad \textbf{(iv)}$$

Where X_{it} *– represents either the ESG combined score or any ESG pillar*

Four variations of Equations (3) to (6) will be estimated, with each variant having different sets of control variables as shown in sub-equations (i) to (iv) in the box. The different combinations of the control variables have been used to ensure that no two highly correlated variables are included in the same model. Hence, for instance, PRICE and PBV are not used together in a model because of the high correlation between them.

ii) ECONOMETRIC PROCEDURE

This study uses panel data due to a combination of time series and cross-sectional observations in the dataset. To investigate the relationship between ESG scores and firm performance across JSE-listed firms, this study first employs the Random and Fixed Effects models followed by the Quantile Regression model.

iii) RANDOM AND FIXED EFFECTS MODEL

In line with ESG-firm performance studies globally (Almeyda and Darmansyah, 2019; Eccles et al., 2013; Khan and Sarafeim, 2015) and South Africa (Masongweni and Simo-Kengne, 2024; Muzanya, 2022), we use the random and fixed effects models to examine the impact of overall ESG and its components have on firm performance, controlling for the influence of total assets (SIZE), share price (PRICE), earnings per share (EPS), price-to-book value (PBV) and the COVID-19 pandemic (COVID).

The use of these models enables the distinction between firm characteristics (captured by the fixed-effects model) and random variations (captured by the random-effects model), both of which may influence the relationship between ESG factors and firm performance (Lin, Lee and Law, 2020:936). The model equations are specified as follows:

Random Effects Model (REM)

The Random-Effects model is also referred to as the error component model as the individual effects are randomly distributed across the cross-sectional units, thereby enabling it to capture individual effects. The regression model is specified with an intercept term representing the overall constant term of the model equation (Hiestand, 2005:4). The REM accounts for firm heterogeneity (μ_i) within the error term (ϵ_{it}), while allowing the intercept (β_0) To be common across all firms.

The Random Effects Model equation is presented below:

$$FP_{it} = \beta_0 + \beta_1 ESG_{it} + \gamma X_{it} + \mu_i + \epsilon_{it} \tag{7}$$

Where:

FP_{it}: Financial performance of firm *I* at time *t*, measured by indicators Tobin's Q (TQ), the log of market capitalisation (LGMCAP) and returns on equity (ROE).

β_0: The intercept, representing the average financial performance when all other factors are zero for all firms.

$\beta_1 ESG_{it}$: Coefficient of ESG score and/or each of the three pillars (ENV, SOC, GOV), capturing the direct effect of a firm's ESG performance on its financial outcomes.

γX_{it}: Vector of control variables, which include firm size, and share price. Price-to-book value, earnings-per-share and COVID-19 dummy to help isolate the effect of ESG on firm performance.

μ_i: Random effect specific to firm *i,* which varies across firms but is consistent over time for each firm. It represents all firm-specific characteristics not included as variables.

ϵ_{it}: Error term that accounts for random shocks or unexplained variations in FP at each point in time(*t*).

Fixed Effects Model (FEM) equation

In contrast to the Random-Effects model, the Fixed-Effects regression models solve the shortcomings of the traditional OLS models by explicitly considering the effect of firm heterogeneity. It accounts for this heterogeneity by allowing different intercepts, one for each firm in the sample data, by using dummy variables (Muzanya, 2022:25)

$$FP_{it} = \alpha_i + \beta_1 ESG_{it} + \gamma X_{it} + \epsilon_{it} \qquad (8)$$

Where:

FP and ESG are as defined above.

α_i: Firm-specific intercept, capturing any unique, time-invariant attributes of firm *i* that could affect financial performance. This value differs for each firm but remains constant over time.

γX_{it}: Vector of control variables similar to those in the REM, including our variables of price, EPS, PBV etc.

ϵ_{it}: Time-specific error term capturing variations in FP not explained by the model variables.

As stated earlier, four separate models are estimated for each measure of FP to account for the alternating effect of multicollinear variables of PRICE and PBV and the moderating role of COVID-19.

Diagnostic Tests

In determining the most appropriate model between the REM and FEM, the Hausman test is employed. This is a diagnostic test that helps decide between the REM and FEM by evaluating whether the independent variables are correlated with the individual effects (Hausman, 1978:7). If the null hypothesis of 'No correlation' is rejected, the FEM is deemed more appropriate, otherwise, the REM is preferred by default. The adjusted – R^2 statistic is used to measure the 'goodness of fit' of each model, with a higher adjusted – R^2 indicating a better fit and reliability of a model's explanatory power. In addition, the Durbin-Watson test is used to detect autocorrelation in the model's residuals, this is particularly important as autocorrelation introduces bias standard errors which lead to faulty interpretations (Franzen, 2019, p.12). Finally, the test for normality evaluates whether the residuals in the model are normally distributed, an assumption underpinning the traditional Ordinary Least Squares (OLS) and related linear regression methods. If residuals are not normally distributed, it violates the assumption of normality of errors, which is critical for ensuring unbiased and efficient estimates as well as valid hypothesis tests.

If significant deviations from normality are detected, Quantile Regression becomes a suitable alternative in examining our model. Unlike OLS, Quantile Regression is useful when the dependent variable is non-normally distributed and it has nonlinear relationships with predictor variables making it robust to outliers and capable of modelling heterogeneous effects across the data distribution (Sullivan, Warkentin and Wallace, 2021:533).

IV) QUANTILE REGRESSION MODEL

Subsequently, the Quantile Regression analysis is employed to examine the differential effects of ESG scores across varying quantiles of firm performance across four quartiles. The quantile regression was first coined by Koenker and Bassett (1978) to model the relationship between independent and explanatory variables at different points in the conditional distribution of the dependent variables. The use of the quartile model is guided by previous studies using quantile regression (Han, 2016; Naik, 2017; Maji and Lohia, 2022; Wu and Chang, 2022). Quantile regression is particularly suited for the study of ESG and firm financial performance across South Africa due to its ability to capture the heterogeneous effects of ESG variables across the entire distribution of financial performance metrics (Lin et al., 2021:937).

The reasons for utilizing a quantile regression method in this study can be summarised as follows: (i) the procedure provides more accurate and reliable results in the presence of outliers and heavy-tailed distributions in comparison to linear models, and (ii) the quantile regression procedure does not consider any distributional assumptions, enabling the data to conform to its asymmetric distribution.

The first step is to estimate a single relationship model of the impact of ESG information disclosure on firm financial performance.

Following Buchinsky (1998) the quantile regression can be specified as:

$$Y_i = X_{it} + \varepsilon_i \tag{9}$$

$$quant_\theta(Y_i/X_{it}) = X_{it}\beta_\theta \tag{10}$$

Here, conditional θ- quantile $Q_\theta(Y_i|X_{1i}, \dots X_{ki})$ of Y_i is a linear function of the regressions $X_{1i}, \dots, X_{ki}$

For a sample i = 1,2, …, N, the model is expressed as:

$$quant_\theta\left(\frac{Y_i}{X_{it}}\right) = \beta_{\theta,0} + \beta_{\theta,1}X_{2i} + \dots\dots + \beta_{\theta,k}X_{ki} + \varepsilon_i^\theta \tag{11}$$

Where X_i is the i^{th} observation for regressor j = 1…,k; $Q_\theta(\varepsilon_i^\theta|\underline{x_i}) = 0\beta_\theta$ is the coefficient estimate for θ^{th} quantile regression, where $0 < \theta < 1$. Following the steps of previous researchers in the field utilising the same estimation technique (Fiaschi et al., 2020; Lin, Lee, and Law, 2020), this study applies rigorous quantile estimation techniques to ensure analytical reliability. Despite the sample limitation of 28 firms over 11 years, the study leverages this approach to maximise the insights that can be derived from the available data on ESG and firm performance over the period. Each quartile represents 25% (0.25) of the firm performance distribution, allowing a generalised but robust analysis of the ESG-performance relationship across low, medium, and high-performance segments. Two model diagnostic tests are conducted to evaluate the performance of the model. These are the quantile slope equality test and symmetric quantiles test for each model. The quantile slope equality test assesses whether the slope coefficients of the independent variables are consistent across different quantiles of the dependent variable's distribution (Wu and Change, 2022:1533). If the slope equality test's null hypothesis is rejected. It would reveal significant differences in slopes across quantiles, suggesting that the predictors have heterogeneous effects on the dependent variable. On the other hand, the symmetric quantile test assesses whether the estimated coefficients at symmetric quantiles (e.g., 25th and 75th percentiles) are mirror images around the median. This is useful for identifying whether the effect of predictors on the lower tail of the distribution differs in magnitude or direction from their effect on the upper tail (Salaminand Kovacs, 2021:34). Symmetry in the quantiles would suggest a balanced influence of the predictors across the distribution, while asymmetry can highlight outliers or the different effects those predictors have on specified points of the distribution versus the central tendency.

Similar to the FEM and REM four different models are estimated for each dependent variable to determine the alternating effect of the multicollinear variables of: Share Prices and Price-to-Book-Value as control variables and the impact of COVID–19 on firm performance. The quantile regression allows for the possibility that the relationship between the model predictors and the dependent variable could vary at different points in the firm performance distribution, thus an improvement from the limitations of traditional linear models which assume uniformity across all data points (Veeravel, Sadharma and Kamaiah, 2023:745).

CHAPTER FIVE

EMPIRICAL ANALYSES AND RESULTS

5.1. Introduction

The objectives of this study, as outlined in Chapter 1, are as follows: (i) investigate the relationship between ESG and firm performance over time; (ii) analyse which specific ESG indicators have the most significant impact on the performance of JSE listed companies; and (iii) determine if there is a heterogenous effect of ESG on the conditional distribution of financial performance for South African companies. To offer meaningful results, we investigate these objectives by employing two renowned econometric techniques: the random/fixed-effects model and the quantile regression model.

This section presents firstly, the preliminary statistics of our data such as the descriptive statistics and correlation matrix, before presenting the results of the econometric techniques, their diagnostics and finally the interpretation of the results.

5.2. Descriptive Statistics

To explore the empirical distribution of the variables included in this study. We computed the descriptive statistics of all the variables included in the study. The results are shown in Table 8 below.

Table 9: Descriptive Statistics Results

	MEAN	MEDIAN	MAX	MIN	STD. DEV.	SKEWNESS	JARQUE-BERA	PROBABILITY
ESGC	54.78	54.78	89.03	1.36	16.09	-0.23	4.37	0.11
ENV	53.91	54.83	96.41	0.00	26.41	-0.25	17.80	0.00
SOC	61.23	64.36	96.03	1.21	19.72	-0.69	27.28	0.00
GOV	54.26	55.54	93.22	2.69	19.26	-0.09	9.78	0.01
LGTA	9.81	9.63	11.39	8.22	0.72	0.47	16.36	0.00
LGMCAP	9.50	9.48	10.45	7.92	0.46	-0.49	14.87	0.00
PRICE	12.10	7.34	126.65	0.07	18.24	3.81	4456.09	0.00
TQ	0.93	0.61	8.11	0.03	1.14	2.96	2269.30	0.00
PBV	2.92	1.97	15.44	0.21	2.65	1.87	379.30	0.00
EPS	0.92	0.55	19.86	-3.61	1.66	5.59	41992.00	0.00
ROE	0.18	0.16	0.87	-1.81	0.23	-2.39	6379.94	0.00

The descriptive statistics provide valuable insight into the distribution of the variables under study. Offering insight into the data's central tendencies, the mean measures the average value of each variable, while the median represents the midpoint for that variable within the dataset. The maximum and minimum values indicate the range of the dataset, capturing the highest and lowest observations.

Standard deviation highlights the dispersion of the data around the mean, with higher values indicating greater variability. The Jarque-Bera (JB) values indicate normality, with high JB values and $p < 0.05$ suggesting non-normality. Skewness thresholds of ±3 reflect acceptable asymmetry; values beyond this indicate extreme skewness, with >3 showing right-tail dominance and <-3 signalling left-tail dominance. The ESGC score has a mean and median of 54.78, suggesting that JSE-listed firms, on average, meet moderate disclosure standards as per LSEG Refinitiv and JSE guidelines. The range, spanning from a minimum of 1.36 to a maximum of 89.03, reflects considerable variability in disclosure levels, with some firms performing exceptionally well and others lagging. The standard deviation of 16.09 underscores this moderate variability, while a skewness of -0.23 indicates a slight left skew, suggesting most firms cluster around higher scores. The JB test probability of 0.11 suggests that the ESGC scores do not significantly deviate from normality.

The ENV pillar displays a mean of 53.91 suggesting moderate environmental disclosure among firms. The median of 54.83 indicates a central tendency slightly above the mean, hinting at a cluster of firms with moderately higher scores. However, the wide range from 0.00 to 96.41, combined with a std. Dev of 26.41, highlights significant variability. The skewness of -0.25 shows a slight left skew, reflecting that more firms perform moderately well than poorly. The JB test p-value of 0.00 indicates significant non-normality, likely due to firms with minimal or no environmental disclosures. The SOC scores outperform other ESG components, with a mean of 61.23 and a median of 64.36, reflecting relatively stronger performance in social initiatives. However, the wide range from 1.21 to 96.03, along with a standard deviation of 19.72, indicates substantial variability. The skewness of -0.69 signifies a pronounced left skew, suggesting that many firms perform well, but a small sub-set pulls the average down. A JB p-value of 0.00 confirms significant non-normality in social scores. Lastly among the ESG pillars, the GOV scores reveal a mean of 54.26, closely mirroring the ESGC score, and a median of 55.54, indicating balanced disclosure. The range of 2.69 to 93.22 and a standard deviation of 19.26 reflect notable disparities in governance practices. Skewness at -0.09 suggests a nearly symmetrical distribution. However, the JB test p-value of 0.01 highlights significant non-normality.

The descriptive statistics offer insights into the financial characteristics of JSE-listed firms when examining Tobin's Q (TQ), Returns on Equity (ROE) and Market Capitalisation (LGMCAP). TQ, a measure of a firm's market value relative to its asset value, has a mean of 12.10 and a median of 7.34, indicating that most firms have a market valuation exceeding their asset base, though the median is substantially lower than the mean. This discrepancy points to a right-skewed distribution, confirmed by a skewness value of 3.81. This high positive skewness suggests that a few firms have extremely high market values, distorting the average. The range of 0.07 to 126.65, along with a standard deviation of 18.24, reflects significant variability, with certain firms having exceptionally high valuations. The Jarque-Bera (JB) test statistic of 4456.09 and a p-value of 0.00 strongly reject the null hypothesis of normality. Additionally, ROE, a measure of profitability, also shows substantial variability, with a mean of 9.81 and a median of 9.63, suggesting that most firms achieve modest levels of profitability. The range from 8.22 to 11.39 reflects narrower variability compared to other variables, as indicated by a standard deviation of 0.72. The skewness value of 0.47 indicates a slight right skew, with most firms earning typical ROE levels but a few significantly outperforming the majority. The JB test statistic of 16.36, with a p-value of 0.00, confirms significant non-normality, likely influenced by firms with exceptionally high or low profitability. Lastly, Market Capitalisation (LGMCAP), has a mean of 9.50 and a median of 9.48, indicating a balanced distribution around the average. The range from 7.92 to 10.45 suggests modest variability in firm sizes compared to other variables, as supported by a standard deviation of 0.46. The skewness of -0.49 reveals a slight left skew, indicating that a greater proportion of firms are clustered at higher market capitalisation levels. The JB test statistic of 14.87 and a p-value of 0.00 confirm significant deviations from normality, though the distribution appears less extreme compared to TQ.

Overall, the firm performance measures exhibit variability, with Tobin's Q displaying the most significant dispersion and skewness due to outliers in market valuations. While ROE and market capitalisation are less variable, they still show evidence of non-normality, as indicated by significant JB test results.

5.3. Correlation Matrix

Table 9 below presents the results of the pairwise correlation across all the variables used in this study. By analysing these correlations, we can assess the interplay between environmental, social, and governance (ESG) scores and key financial performance metrics, offering an understanding of how ESG practices align with firm valuation and profitability.

Table 10: Correlation Matrix

	ESGC	**ENV**	**SOC**	**GOV**	**LGMCAP**	**LGTA**	**TQ**	**EPS**	**PBV**	**PRICE**	**ROE**
ESGC	1.0000										
ENV	0.7327**										
SOC	0.7815**	0.6928**									
GOV	0.6169*	0.3319	0.2075								
LGMCAP	0.2581**	0.3134*	0.3969**	-0.0861*							
LGTA	0.2275*	0.4033	0.3893	-0.0991*	0.6568***						
TQ	-0.0078*	-0.2144*	-0.0415*	0.0519	0.1298**	-0.5023*					
EPS	0.2823	0.1875*	0.2569	0.0923	0.4157**	0.1178*	0.1899*				
PBV	-0.1386	-0.2448	-0.1894	-0.0950	0.0519	-0.3501*	0.5567	0.1505			
PRICE	0.0880	-0.0009*	0.1043	-0.0490*	0.4581*	0.0589*	0.2662	0.7059*	0.2468		
ROE	0.1948**	0.1131*	0.0794**	0.1386*	0.0381**	-0.1506*	0.2057**	0.1861	0.3980*	0.1796	
COVID	0.1473*	0.0454	0.1369*	0.0248	-0.0113**	0.0446*	-0.0840	0.1904	-0.0907	0.0753	0.0427*

Where ***, **, * represent the 1%, 5% and 10% levels of significance respectively

The results of the correlation matrix reveal important insights into the relationship among ESG scores, financial performance measures and other variables. Among the ESG pillars, the SOC pillar has the strongest positive correlation with the combined ESG score at (0.7815), followed closely by the ENV score at (0.7327). The GOV pillar, while still positively correlated, exhibits a weaker relationship with ESGC at (0.6169). This pattern shows a greater contribution of environmental and social disclosure to a firm's overall ESG performance, whereas governance disclosure, though positively correlated contributes comparatively.

When considering the relationship between ESG and firm performance, Tobin's Q, which measures market valuation relative to asset value, displays weak and negative correlations with ESGC (-0.0078), ENV (-0.2144), and SOC (-0.0415). Tobin's Q shows a weak positive correlation with Governance (0.0519), indicating minimal impact of governance practices on market valuation. These low correlations suggest that higher ESG scores, particularly the ENV and SOC dimensions, do not strongly correlate with higher market valuations. On the other hand, Returns on Equity (ROE) shows a weak but positive correlation with ESGC (0.1948), ENV (0.1131) and SOC (0.0794), implying that firms with better ESG performance may achieve slightly higher ROE although to a small extent. Additionally, LGMCAP is moderately correlated with SOC (0.3969) and ENV (0.3134) showing that larger firms tend to engage more in environmental and social disclosure, however, the negative correlation between LGMACP and GOV (-0.0861) suggests that governance practices are less tied to firm size compared to the other pillars.

An analysis of the other variables shows that Total Assets (TA) has a positive correlation with ENV (0.4033) and SOC (0.3893), indicating that firms with more assets tend to perform in social and environmental aspects. Additionally, the correlation between Earnings per Share (EPS) and ESGC (0.2823), as well as individual pillars further supports the idea that firms with stronger ESG practices tend to display better financial performance. Interestingly, Price (PRICE) and Price-to-Book ratio (PBV) show weak and even negative correlations with the ESG scores, showing that the two variables do not necessarily align with ESG performance. The COVID variable shows weak positive correlations with ESG scores and firm performance, suggesting that the pandemic's impact on ESG practices and financial performance might not be substantial or consistent across firms.

Overall, while there are some positive correlations between ESG performance and firm profitability, the relationships are not strong, indicating that ESG factors may not always align, suggesting that firm valuations may not always align with ESG performance.

To avoid multicollinearity in regression analysis, the variance inflation factor (VIF) tests between variables were conducted. The highest VID obtained from the regression was 7.5 when price and PBV were included in a model. Studies such as (Franzen, 2019:13; Izcan and Bektas, 2022:8; Nekhili, et al., 2019:141) use the maximum value of 5 as a cut-off point for the VIF. Under the same guidance, we reject the null hypothesis, revealing their collinearity and motivating the need to separate the two variables in any estimated model.

5.4. Random and Fixed Effect Diagnostics

The results of our random and fixed effects regression models are summarized in Tables 10 and 11. The analysis of the results begins with an evaluation of the overall performance of the models. The Hausman test results favour the Random-Effects Model (REM), as the non-significant p-values indicate that unobserved heterogeneity across firms is better captured as random rather than fixed. This preference is further substantiated by the REM's consistently higher adjusted-R^2 values, particularly for Tobin's Q (TQ) and LGMCAP, demonstrating its superior goodness-of-fit and explanatory power. In contrast, the fixed effects model (FEM), while effective in accounting for firm-specific, time-invariant characteristics, exhibits lower adjusted-R^2 values and fewer significant relationships, particularly with LGMCAP and ROE, highlighting its limited ability to capture cross-sectional ESG variations within the dataset. Further insights into model performance can be seen from the cross-section and idiosyncratic random variances of the REM.

The results of the overall ESG scores, the cross-section random variance, ranging from 0.066 to 0.702, reflects the extent to which firm-level characteristics, such as organisational structure or industry, contribute to performance variation. For TQ and LGMCAP, the relatively high cross-section variance values emphasise the importance of accounting for firm-level heterogeneity in understanding the impact of ESG practices. Conversely, the idiosyncratic random variance, ranging from 0.137 to 0.613, captures firm-specific deviations due to time-varying factors, such as economic trends or short-term shocks. The higher values for TQ and ROE models suggest that time-specific factors also play a meaningful role in shaping firm performance. Together, these variances confirm the REM's ability to balance firm-specific and time-dependent effects. The inclusion of PBV as a financial performance metric further enhances model fit, as evidenced by its stronger association with performance measures like ROE compared to share prices. PBV's significant positive relationship with models where ROE is the independent variable aligns with the notion that firms with better valuation multiples often reflect superior profitability metrics. Lastly, the inclusion of COVID-19 as a dummy variable captures the pandemic's adverse market-wide impact. Its statistically significant negative association with LGMCAP and ROE validates the broader economic consensus on the detrimental effects of the pandemic (Magubane, 2020; Masongweni, 2024; Mazzioni, 2024), with market-based measures of performance (LGMCAP and TQ) being more sensitive to pandemic conditions than accounting performance metrics like ROE, reinforcing the importance of controlling for external shocks in evaluating ESG-firm performance relationships.

While the REM demonstrates better explanatory power, these results also underscore the methodological limitations of traditional panel regression models when applied to complex relationships such as ESG and firm performance. A significant Jarque-Bera test for normality across all models indicates that the residuals deviate from a normal distribution, violating one of the key assumptions of classical linear regression. This non-normality, coupled with other challenges such as the potential presence of heteroscedasticity (unequal error variances), raises concerns about the robustness of mean regression methods like REM and FEM in this context.

TABLE 11: RANDOM EFFECTS MODEL RESULTS SUMMARY

	RANDOM EFFECTS											
	TQ				**LGMCAP**				**ROE**			
	1	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**
ESG - COMBINED SCORE	-0.009**	-0.011***	-0.001	-0.002	-0.002**	-0.003***	0.000	0.000	0.002**	0.001**	0.003***	0.003***
ADJ - R2	0.246	0.233	0.581	0.582	0.423	0.407	0.614	0.611	0.031	0.031	0.102	0.102
F-STAT	22.838	26.507	93.756	117.442	50.198	58.483	107.446	132.528	3.119	3.640	8.639	10.515
HAUSMAN TEST	1.000	0.005***	1.000	0.005***	0.270	0.190	1.000	0.000***	1.000	0.000***	0.000***	0.000***
CROSS-SECTION RANDOM	0.702	0.702	0.701	0.701	0.239	0.239	0.252	0.252	0.093	0.093	0.066	0.065
IDIOSYNCRATIC RANDOM	0.611	0.613	0.438	0.437	0.176	0.179	0.137	0.138	0.173	0.175	0.172	0.174
JARQUE-BERA	1215.748***	1046.055***	441.555***	438.116***	6.857**	7.286**	30.815***	34.778***	8760.228***	9220.344***	21635.130***	22315.02***
ENVIRONMENTAL PILLAR	-0.014***	-0.015***	-0.011***	-0.011***	-0.001	-0.001*	-0.000	-0.000	0.001**	0.002**	0.002***	0.002***
ADJ - R2	0.286	0.271	0.616	0.617	0.419	0.398	0.614	0.611	0.036	0.034	0.103	0.099
F-STAT	27.898	32.141	108.549	136.077	49.327	56.399	107.544	132.673	3.468	3.922	8.677	10.161
HAUSMAN TEST	1.000	0.002***	1.000	0.000***	1.000	0.395	0.001***	0.000***	1.000	0.000***	0.000*	0.000*

	RANDOM EFFECTS											
	TQ				**LGMCAP**				**ROE**			
	1	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**
CROSS-SECTION RANDOM	0.741	0.740	0.725	0.725	0.245	0.245	0.253	0.253	0.092	0.092	0.068	0.068
IDIOSYNCRATIC RANDOM	0.587	0.592	0.415	0.415	0.177	0.181	0.137	0.138	0.173	0.175	0.172	0.174
JARQUE-BERA	461.102***	380.501***	220.800***	219.6	7.307**	8.563**	29.827***	34.138***	8448.773***	8820.376***	20049.1	20373.9
SOCIAL PILLAR	-0.005	-0.007**	-0.000	-0.000	-0.000	-0.002	0.000	0.000	0.000	0.000	0.001	0.001
ADJ - R2	0.237	0.222	0.579	0.579	0.418	0.400	0.614	0.611	0.021	0.018	0.076	0.074
F-STAT	21.832	24.941	92.960	116.377	49.177	56.605	107.412	132.298	2.413	2.558	6.540	7.655
HAUSMAN TEST	1.000	0.009***	1.000	0.000***	1.000	0.136	0.001***	0.000***	0.000***	0.000***	1.000	0.000***
CROSS-SECTION RANDOM	0.692	0.692	0.680	0.680	0.237	0.237	0.248	0.248	0.093	0.093	0.069	0.068
IDIOSYNCRATIC RANDOM	0.616	0.621	0.439	0.438	0.177	0.181	0.137	0.138	0.172	0.175	0.172	0.174
JARQUE-BERA	1527.923***	1379.8	451.9	449.7	6.508**	6.640***	31.419***	35.847***	7388.642***	7902.7	16961.350***	17666.6
OBSERVATIONS	336	336	336	336	336	336	336	336	336	336	336	336
GOVERNANCE PILLAR	-0.004	-0.004	0.001	0.001	-0.002***	-0.002***	-0.001	-0.001	0.001	0.001	0.001**	0.001**

RANDOM EFFECTS												
	TQ				**LGMCAP**				**ROE**			
	1	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**
ADJ - R2	0.236	0.217	0.582	0.583	0.426	0.406	0.615	0.612	0.024	0.022	0.085	0.080
F-STAT	21.664	24.224	94.386	118.158	50.802	58.202	107.873	133.112	2.646	2.879	7.208	8.321
HAUSMAN TEST	0.219	0.055*	1.000	0.000***	1.000	0.714	1.000	0.000***	0.000***	0.000***	0.000***	0.000***
CROSS-SECTION RANDOM	0.741	0.740	0.725	0.725	0.246	0.246	0.252	0.252	0.090	0.089	0.069	0.068
IDIOSYNCRATIC RANDOM	0.617	0.623	0.439	0.438	0.176	0.180	0.137	0.138	0.173	0.175	0.172	0.174
JARQUE-BERA	1319.717***	1156.784***	463.628***	462.642***	7.616***	8.3	29.561***	33.856***	7692.30***	8054.859***	16996.810***	17403.170***
OBSERVATIONS	336	336	336	336	336	336	336	336	336	336	336	336

Where ***, **, * represent the 1%, 5% and 10% levels of significance respectively

TABLE 12: FIXED EFFECTS MODEL RESULTS SUMMARY

	FIXED EFFECTS											
	TQ				LGMCAP				ROE			
	1	2	3	4	1	2	3	4	1	2	3	4
ESG COMBINED SCORE	-0.012***	-0.014***	-0.002	-0.002	-0.003**	-0.003***	0.000	-0.000	-0.000	0.000	0.000	0.000
ADJ - R2	0.715	0.713	0.848	0.854	0.855	0.851	0.913	0.912	0.436	0.424	0.442	0.427
F-STAT	27.316	27.796	58.453	64.159	62.976	62.518	110.495	112.917	9.082	8.944	9.309	9.067
JARQUE-BERA	1329.421***	1339.949***	727.331***	736.295***	34.690***	22.140***	37.32482***	33.653***	45456.26***	46892.78***	39847.80***	42562.940***
ENVIRONMENTAL PILLAR	-0.018***	-0.019***	-0.013***	-0.012***	0.002*	-0.002**	-0.000	-0.000	0.001	0.001	0.000	0.000
ADJ - R2	0.737	0.733	0.868	0.868	0.855	0.848	0.913	0.912	0.436	0.425	0.428	0.444
F-STAT	30.278	30.603	69.974	69.974	62.518	61.317	110.591	113.037	9.106	8.975	9.089	9.354
JARQUE-BERA	1098.961***	1098.775***	568.221***	568.221***	37.272***	23.104***	37.687***	33.678***	46288.21***	45949.56***	40756.380***	39276.84***
SOCIAL PILLAR	-0.008**	-0.010***	-0.000	-0.001	-0.002	-0.003**	0.000	-0.000	-0.001	-0.000	-0.001	-0.000
ADJ - R2	0.710	0.706	0.853	0.854	0.854	0.848	0.913	0.912	0.439	0.424	0.444	0.426
F-STAT	26.608	26.920	61.826	64.029	62.261	61.468	110.491	112.925	9.184	8.955	9.369	9.031
JARQUE-BERA	1277.342***	1287.911***	731.719***	733.021***	36.525***	22.454***	37.372***	33.789***	41879.110***	43314.36***	36955.610***	39732.330***

	FIXED EFFECTS											
	TQ				**LGMCAP**				**ROE**			
	1	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**
GOVERNANCE PILLAR	-0.005*	-0.005*	0.001	0.001	-0.002**	-0.002***	-0.000	-0.000	-0.000	-0.000	0.000	0.000
ADJ - R2	0.709	0.703	0.853	0.854	0.856	0.850	0.913	0.912	0.436	0.423	0.442	0.426
F-STAT	26.529	26.646	61.823	64.022	63	116.106	110.688	113.143	9.089	126.136	9.303	9.019
JARQUE-BERA	1456.9	1486.813***	724.479***	727.197***	35.903***	23.384***	36.950***	32.948***	45124.88***	45096.380***	39191.76***	40921.250***
OBSERVATIONS	336	336	336	336	336	336	336	336	336	336	336	336

Where ***, **, * represent the 1%, 5% and 10% levels of significance respectively

5.5. Analysis of the Random and Fixed Effects Models

The impact of ESG initiatives on firm performance after controlling for other explanatory variables is shown in Table 10. Based on the results, the overall ESG score demonstrate a mixed relationship with firm performance measures across all models; where significant, coefficients are negative for market-based measures but positive effects for the accounting-based measure of performance. The ESG combined score's significant effect across multiple models suggests that companies actively improving and disclosing their ESG performance experience a reduction in their financial outcomes measured by TQ and LGMCAP but improving firm performance concerning Returns-on-Equity, a trend consistent with findings in emerging markets as reported by (Evans, 2023; Duque-Grisales and Agruilera-Caracuel, 2019; Muzanya, 2022; Nkomani, 2013).

Similarly, the individual ENV and SOC pillars display consistent negative coefficients under the market-based measures of performance. Concerning ROE, the combined ESG score and ENV pillar's effect is mainly positive with varying significance, while the SOC pillar presents no significant effect on ROE. This resembles the findings of Flammer (2015:26) whose study suggested that ENV and SOC initiatives may impose immediate costs for firms, which can reduce their short-term market performance. However, this short-term setback potentially manifests as long-term gains in ROE through improved operational efficiency which then has positive trickle-down effects.

In contrast, the GOV pillar displays no significant effect on TQ, a small but significant negative effect on LGMCAP, and no significant associations with ROE despite its positive coefficients. Models that included PBV showed stronger fits than those modelled with PRICE, with PBV also demonstrating a positive and significant association with firm performance, especially with ROE. These results reflect the mixed association with stakeholder theory by showing that while initiatives taken to enhance ESG practices incur short-term costs (TQ and LGMCAP), these initiatives can enhance long-term performance, evident in the relationship with ROE (Chininga et al., 2020; Khan et al., 2016; Xie et al., 2019). In addition, the expectations of agency theory are also met, with ESG initiatives highlighting the short-term costs incurred when a firm prioritises long-term goals at the expense of short-term market value (Barnea and Rubin, 2010; Duque-Grisales and Caracuel, 2019; Nekhili et al., 2019).

Additionally, the inclusion of COVID as a dummy variable across models captures the adverse market-wide shocks that firms faced, particularly in terms of valuation (LGMCAP) and profitability (ROE). COVID's statistically significant negative association with these measures confirms its adverse effect on firm performance, aligning with broader economic rationale evident in studies that have been conducted with the impact of COVID-19 accounted for (Magubane, 2020; Masongweni, 2024; Mazzioni, 2024). However, this impact varies by model and measure of firm performance, with a stronger effect on market-based metrics, suggesting that firms' market valuations were more sensitive to pandemic-driven uncertainties than operational metrics.

The next part of this chapter will focus on the analysis of the results of the quantile regression technique and the robustness of the models in making inferences.

5.6. Quantile Regression Slope Equality Test

As shown in Table 13, the inter-quantile slope equality tests confirm no significant differences in the impact of the combined ESG score and GOV pillar across the distribution and any measure of performance suggesting that these factors exert a uniform impact that is valued consistently by the market, irrespective of a firm's position in the distribution. The SOC pillar on the other hand, exhibits a significant negative difference in the low-to-mid quartiles (0.25 and 0.50) when TQ is the measure of performance, and this effect diminishes and becomes insignificant in the upper quartiles (0.50 and 0.75) for all measures of performance. This implies that higher SOC pillar scores may be perceived as costly or risky by investors, potentially due to short-term profit concerns, while the effects of such initiatives may not hinder valuation to the same extent for higher-valued firms. Lastly, the ENV pillar displays a significant negative effect on LGMCAP and ROE in the upper end of the distribution but no significant effect elsewhere. This suggests that companies positioned in the mid-to-high quartile of the market or profitability distribution experience a significantly different impact from environmental projects compared to firms situated in the lower half of the distribution.

The relevance of PBV is highlighted again, with a significant negative effect on TQ in the mid-to-upper quantiles, implying that the effects of higher PBV are statistically different between firms in the (0.25) quartile to those in the mid-quartile (0.50). PRICE on the other hand, PRICE has no significant coefficient across all models and measures of firm performance, indicating that PRICE – firm performance relationship is stable across the distribution and does not display significant quartile-specific differences in its effect on firm value, market size or profitability. The effects of COVID-19 are found to be positive and significant only in the (0.5 – 0.75) quartiles for ROE. In framing, this refers to the possibility that firms within this part of the distribution had greater resources or operational flexibility to adapt to pandemic-related concerns, and this impact varied between the (0.50) quartile to the (0.75) quartile.

TABLE 13: SUMMARY OF THE SLOPE EQUALITY TESTS

		SLOPE EQUALITY TESTS											
		TQ				**LGMCAP**				**ROE**			
QUANTILE	VARIABLE	1	2	3	4	1	2	3	4	1	2	3	4
	ESGC	-0.003	0.000	-0.003	-0.003	0.002	0.002	0.002	-0.001	0.000	0.000	-0.001	0.000
	ENV	0.001	0.001	-0.001	-0.001	0.004***	0.004***	0.002	0.001	0.000	0.000	-0.001*	0.000
0.25,0.50	SOC	-0.004**	-0.004**	-0.003**	-0.004**	0.002	0.001	0.001	0.000	0.000	0.000	0.000	0.000
	GOV	0.000	-0.001	-0.001	-0.001	0.000	-0.001	-0.001	-0.002	0.000	0.000	0.000	0.000
	ESGC	0.001	-0.001	-0.002	-0.001	0.002	0.002	-0.002	0.000	0.000	0.000	0.000	0.000
	ENV	-0.001	-0.001	-0.001	-0.001	0.000	0.001	-0.002**	-0.002**	-0.001***	-0.001***	-0.001	0.000
0.5,0.75	SOC	-0.004	-0.004	0.000	0.001	0.001	0.000	0.001	0.002	0.000	0.000	0.000	0.000
	GOV	0.002	0.003	-0.002	-0.002	0.002	0.002	0.000	-0.001	0.000	0.000	0.000	0.000

Where ***, **, * represent the 1%, 5% and 10% levels of significance respectively

5.7. Quantile Regression Slope Asymmetry Test

The slope asymmetry test is used to examine whether the effects of explanatory variables asymmetrically differ across quantiles, that is, whether the slopes of specific variables differ between two non-symmetric quantiles. The results of the slope asymmetry test are presented in Table 13, a compilation of the potential asymmetric effects on the combined ESG model, and a summary of results from the ESG pillar scores. The lack of significant coefficients for the overall ESG score across all measures of firm performance (FP) in the slope asymmetry test suggests that ESG factors do not have a statistically meaningful asymmetric effect on firm performance at different levels. In other words, when comparing low to high quartiles (0.25 to 0.75), the overall ESG score appears to have a consistent, non-negative impact for all measures of FP. Similarly, the GOV pillar displays a uniform, insignificant impact across firms within this range of distribution.

The ENV pillar shows a significant positive coefficient for LGMCAP in this 0.25–0.75 range. This suggests that environmental initiatives tend to increase firm market capitalisation, but this effect is more prominent for firms positioned in the middle of the performance spectrum (between -.25 and 0.75). On the other hand, the SOC pillar displayed a significant negative effect for LGMCAP in the 0.25 to 0.75 quartiles, which frames social initiatives as additional costs that dampen market value for firms falling in this range.

In addition, PRICE demonstrates no significant effects, implying its limited relevance for mid-performing firms while PBV shows a consistent, negative effect on all measures of FP. Furthermore, PBV displays a consistently significant negative effect on TQ, reinforcing the idea that higher book values are not negatively reflected in market valuations for firms in the mid-range of the distribution. The overall impact of COVID-19, however, was found to be positive on ROE, implying that firms in the mid-range of the distribution of ROE performance accrued positive impacts from the pandemic period.

In summary, the slope asymmetry test has allowed us to uncover and analyse any asymmetric effects across non-symmetric quantiles, providing a deeper understanding. These results highlight that ESG impacts are not uniform across all firm types or performance levels, and firms may need to tailor their ESG strategies based on their position within the market or distribution to best direct their ESG commitments.

TABLE 14: SUMMARY OF SYMMETRIC QUANTILES TEST

		SYMMETRIC QUANTILES TEST											
		TQ				**LGMCAP**				**ROE**			
QUANTILE	VARIABLE	1	2	3	4	1	2	3	4	1	2	3	4
	CONSTANT	1.063	0.734	-0.998	-0.872	-1.118**	-0.210	-0.329	-0.102	-0.098	0.061	0.089	0.090
	ESGC	-0.005	0.000	-0.001	-0.002	0.000	0.000	0.003	-0.001	0.000	0.000	0.000	0.090
	LGTA	-0.080	-0.069	0.090	0.080	0.112**	0.022	0.010	0.019	0.007	-0.008	-0.010	0.000
0.25,0.75	PRICE	0.006	0.008	-	-	0.001	-0.003	-	-	0.000	0.000	-	-
	PBV	-	-	0.155***	0.146***	-		0.013	-0.010	-	-	0.008	0.008
	EPS	0.019	0.033	-0.011	0.000	0.010	0.061	-0.012	-0.006	-0.019	-0.010	0.013	0.010
	COVID	0.193*	-	-0.100	-	-0.013	-	0.035	-	0.057**	-	0.002	-
	WALD	**0.000**	**0.000**	**0.000**	**0.007**	**0.170**	**0.597**	**0.774**	**0.954**	**0.405**	**0.933**	**0.377**	**0.395**
	ENV	0.002	0.002	0.000	0.000	0.004**	0.004**	0.004	0.003	0.001	0.001	0.000	0.000
0.25,0.75	SOC	-0.001	0.000	-0.004	-0.005**	0.001	0.001	-0.001	-0.002	0.001	0.000	0.001	0.000
	GOV	-0.002	-0.003	0.001	0.001	-0.001	-0.003	0.000	-0.001	0.000	0.000	0.000	0.000
	WALD				**0.000**	**0.038**	**0.081**						

Where ***, **, * represent the 1%, 5% and 10% levels of significance respectively

5.8. Quantile Regression Results

The quantile regression analysis highlights the heterogeneous effects of ESG and its components on different aspects of firm performance (TQ, LGMCAP, ROE). As the linear regression models address the influence of the ESG and performance metrics on the mean of the response variable, we expect the impacts of ESG at different locations of the conditional distribution of firm performance to be different. ESG factors, particularly social and environmental aspects, positively influence higher-valued firms. The ESG combined score (ESGC) shows significance at various quantiles for Tobin's Q, notably at the median (0.5) and the upper quantile (0.75). At the 0.5 quantile, the positive and statistically significant coefficient (0.005) indicates that ESGC is associated with a moderate positive effect on TQ for median-performing firms, an effect that is also prevalent at the highest quartile. This indicates that focused ESG efforts are associated with a moderate positive effect on TQ for median-performing firms and high-performing firms. The ENV – and SOC – pillars are significantly positive for TQ at the 0.5 and 0.75 quantiles, suggesting that investors may reward firms that perform in these disclosures due to enhanced reputational benefits that drive investor confidence. Conversely, the GOV pillar score shows little impact across most quantiles for TQ except at the 0.75 quartile, where it is significant and positive ($p = 0.003$). This implies that governance may play a lesser role in market valuation relative to environmental and social factors.

In terms of LGMCAP as a measure of firm performance, the combined ESG score displayed a significant positive effect in the low-to-mid quartiles (0.25 – 0.50), implying that ESG efforts might be more beneficial in enhancing market capitalisation for smaller firms or those with lower market valuations, possibly as a means of signalling responsible business practices. In terms of the individual pillars, the ENV score is seen to show positive significance in the lowest quartile of the distribution, while the GOV score displays no significant pillar at any point when LGMCAP is the measure of performance. On the other hand, the SOC pillar consistently presents significant positive effects on firm performance for firms within the mid-to-higher end of the distribution.

When measuring financial performance with ROE, the combined effect of ESG shows a strong and consistent positive significance across all quantiles of ROE, showing that regardless of firm size or value, committed efforts to enhance ESG disclosure tend to be rewarding in the form of returns on equity. The ENV pillar score also demonstrates positive significance across all quantiles for ROE when controlling for price-to-book value and/or COVID-19, highlighting how environmental initiatives taken to improve operational efficiency and manage risk and externalities can materialise into higher levels of profit for firms. Similarly, the SOC pillar presents significant positive effects across the mid-to-high quartiles for ROE, once again demonstrating the relevance of good social practices in enhancing firm performance. Lastly, the GOV pillar is also found to demonstrate a significant positive effect on ROE when controlling for PBV, emphasizing the role of sound governance in communicating stability, risk management and internal controls that raise investor confidence and enhance a firm's profitability.

Looking at the control variables, PBV demonstrates a strong and positive association with all measures of firm performance, across nearly the entire distribution, with the strongest effects realized when estimating FP with ROE. This enhances the assertion that PBV is strongly associated with achieving better market valuations, investor confidence, and profitability, especially for firms situated in the mid-to-higher end of the performance distribution. The effects of PRICE, on the other hand, display strong significant effects when estimating FP with LGMCAP across all levels of the distribution, but not a single significant effect when ROE is the dependent variable of interest, suggesting that the price variable does not have a notable impact on the profitability of firms. The effects of PRICE on TQ are found to be statistically positive only in the lowest quartiles (0.25) regardless of the aspect of ESG estimated.

Furthermore, an analysis of the COVID dummy reveals no significant effects when FP is measured by TQ across any aspect of ESG. However, it did negatively affect market capitalisation, while simultaneously demonstrating positive effects on ROE of firms in the upper end of the distribution. These results suggest that COVID had an adverse effect on larger firms likely due to greater operational challenges during the pandemic which necessitated costs reduction and efficiency improvements.

The empirical findings highlight the heterogeneous effects of ESG factors on firm valuation (FV), specifically across Tobin's Q distributions. To examine these differences, we applied an inter-quantile regression approach, testing for the equality of slopes across quantiles using Koenker and Bassett's (1978) methodology. This test provides insights into the statistical significance of coefficient differences between the upper quantiles (90th and 75th) and the lower quantiles (10th and 25th) of each measure of firm performance.

TABLE 15: QUANTILE REGRESSION: COEFFICIENT RESULTS

QUANTILE REGRESSION MODEL : ESG COMPONENTS													
		TQ				LGMCAP				ROE			
VARIABLES	QUANTILE	1	2	3	4	1	2	3	4	1	2	3	4
	0.25	0.001	0.001	0.000	0.000	0.005***	0.004*	0.001	0.000	0.002***	0.002***	0.001***	0.002***
ESGC	0.5	0.005*	0.002	0.003	0.003	0.003*	0.002	0.000	0.001	0.002***	0.002**	0.002***	0.002***
	0.75	0.003	0.003	0.004**	0.004**	0.001	0.000	0.002	0.001	0.002***	0.002***	0.002***	0.002***
	0.25	0.002	0.002	0.001	0.001	0.004***	0.004***	0.001	0.000	0.000	0.001	0.00*	0.001
ENV	0.5	0.001	0.001	0.002**	0.002*	0.000	0.000	-0.001	-0.001	0.000	0.000	0.001***	0.001***
	0.75	0.001	0.001	0.003***	0.003***	-0.001	-0.001	0.001	0.001	0.001***	0.002***	0.002***	0.001***
	0.25	0.000	0.000	0.000	0.000	0.005***	0.004**	0.004**	0.003	0.001***	0.002***	0.001***	0.001***
SOC	0.5	0.005**	0.004**	0.004**	0.004**	0.003**	0.003*	0.003**	0.003**	0.001**	0.001**	0.001**	0.001***
	0.75	0.008***	0.008***	0.004**	0.002*	0.002*	0.003**	0.002**	0.002*	0.001**	0.001**	0.001***	0.001***
	0.25	0.000	0.000	0.000	0.000	0.000	-0.001	-0.001	-0.001	0.000	0.000	0.000	0.001*
GOV	0.5	0.000	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.001**	0.001**
	0.75	-0.002	-0.002	0.003*	0.003*	-0.002	-0.002	0.000	0.001	0.001	0.001	0.001**	0.001**

where ***, **, * represent the 1%, 5% and 10% levels of significance respectively

CHAPTER SIX

DISCUSSION AND CONCLUSION

6.1. Introduction

This chapter concludes the study by summarising the key findings, reflecting on their implications, and offering relevant policy recommendations. The study set out to investigate the relationship between ESG disclosure and firm financial performance among companies listed on the Johannesburg Stock Exchange (JSE) from 2012 to 2023. Specifically, the study aimed to: (i) examine the overall relationship between ESG disclosure and firm financial performance; (ii) analyse the differential effects of the individual ESG pillars (Environmental, Social, and Governance) on both accounting- and market-based measures of performance; and (iii) determine whether the effect of ESG varies across the conditional distribution of firm performance.

To address these objectives, the study employed a combination of Fixed Effects, Random Effects, and Panel Quantile Regression models, enabling both average and distribution-sensitive insights into the ESG–performance relationship. The findings offer a nuanced view of how ESG practices influence firm performance in the South African context and provide empirical evidence that speaks to both stakeholder and agency theory perspectives. This chapter begins by summarising the main results in relation to the research objectives, followed by a discussion of the study's contributions, practical implications, and limitations. The chapter concludes with recommendations for policy and future research.

6.2. Summary of Major Findings

The first objective was to investigate the relationship between ESG disclosure and firm financial performance among JSE-listed companies from 2012 to 2023. To address this, the study applied both Fixed Effects and Random Effects panel models. The Hausman test favoured the Random Effects model, as it more effectively captured unobserved firm-level characteristics and time-related factors, as laid out in the chapter 4. The results revealed that ESG scores have mixed effects on firm performance: market-based measures (TQ and LGMCAP) showed negative impacts, indicating possible short-term costs; accounting-based performance (ROE) exhibited positive effects, suggesting long-term operational gains. These findings validate Hypothesis 1, which proposed that there is a relationship between ESG practices and firm financial performance. The evidence supports the view that ESG integration may incur short-term costs while improving internal efficiencies over time.

The second objective was to analyse the differential effects of the individual ESG pillars, Environmental, Social, and Governance, on firm performance using both accounting- and market-based metrics. In line with this, the results indicated that the ENV and SOC pillars generally had a negative short-term effect on market-based performance measures, with limited impact on ROE. The GOV pillar showed little impact on market value but demonstrated a positive effect on ROE, suggesting its role in improving internal controls and profitability. Thus, Hypothesis 2, which posited that individual ESG pillars would have differential effects on performance, is supported. The results confirm that each ESG dimension contributes uniquely to financial outcomes, with environmental and governance components offering more strategic value over time.

The third objective was to determine whether the effect of ESG varies across the conditional distribution of firm performance. This was achieved using Panel Quantile Regression (PQR). The results showed that the combined ESG score (ESGC) has differential effects depending on a firm's performance level. For TQ, ESGC had a positive and significant effect at the median and upper quantiles, implying that median- and high-performing firms benefit more from ESG integration. In contrast, at lower quantiles, the impact was insignificant. For LGMCAP, positive effects were found at the low-to-mid quantiles, suggesting that smaller firms gain more from ESG by signalling responsible practices. ROE exhibited positive effects across all quantiles, reinforcing ESG's operational and profitability benefits irrespective of performance rank. These results validate Hypothesis 3, which suggested that ESG effects vary across the conditional performance distribution. The quantile regression findings demonstrate the importance of firm-specific positioning in determining how ESG is rewarded or penalised.

In terms of the individual pillars, the ENV pillar showed consistent negative effects on TQ and LGMCAP, highlighting the short-term costs associated with environmental initiatives. However, its positive and significant impact on ROE demonstrates that environmental investments may enhance efficiency and resilience, especially in a resource-constrained environment like South Africa. The SOC pillar displayed insignificant effects on ROE and LGMCAP, and a negative relationship with TQ, indicating that social initiatives may not yield immediate financial benefits. Governance practices produced mixed results, with negative effects on LGMCAP but positive effects on ROE, suggesting that governance reforms strengthen internal performance even if markets fail to immediately price them in.

Collectively, these results reflect a complex alignment with both stakeholder theory and agency theory. ESG activities appear to impose short-term costs that negatively affect market valuation, consistent with agency theory. However, the long-term improvements in ROE align with stakeholder theory, which emphasises trust-building, operational efficiency, and sustainable performance.

6.3. Implications for Financial Performance

ESG integration involves trade-offs between short-term costs and long-term benefits. Market-based metrics, which reflect investor perceptions, often prioritise immediate financial outcomes and may undervalue the strategic advantages of ESG practices. In contrast, accounting-based measures like

Return on Equity (ROE) capture the operational efficiencies and risk mitigation benefits that ESG initiatives tend to deliver over time.

Historically, environmental initiatives have been under-prioritised compared to governance and social concerns, particularly in emerging markets. However, the growing emphasis on stakeholder engagement and inclusivity in corporate strategy signals a potential shift. As global ESG standards and investor expectations evolve, firms that effectively embed environmental priorities into their long-term value-creation models may gain stronger market recognition and develop sustained competitive advantages.

Bridging the gap between market and accounting performance will require firms to improve ESG communication and transparency, ensuring stakeholders understand the long-term value embedded in these practices. Policymakers should consider introducing stronger incentives to encourage ESG adoption, given its contribution to financial resilience and long-term growth. Practitioners, including corporate decision-makers, are advised to prioritise ESG dimensions that offer more immediate financial returns, while progressively building capabilities in areas such as social impact.

For investors, the findings reinforce the value of incorporating ESG metrics into portfolio construction and screening strategies, especially when identifying firms that minimise risk and deliver stable, long-term returns. These results underscore the importance of firms adopting a long-term perspective in their ESG strategies, carefully balancing short-term performance pressures with sustainable growth objectives.

6.4. Limitations and Areas of Future Research

While this thesis offers valuable insights into the relationship between ESG activities and firm performance, several limitations must be acknowledged. First, although the study spans a relatively long period from 2012 to 2023, the sample was limited to only 28 firms that reported consistent ESG data throughout the period. This restricted dataset reduces the generalisability of the findings, as the results are based on a small subset of the broader population of firms listed on the Johannesburg Stock Exchange (JSE).

Second, despite employing quantile regression to uncover heterogeneous relationships within the data, the study was constrained by the limited number of firms across different sectors and industries. This prevented a deeper exploration of how ESG activities may influence firm performance across industries, an area that could have yielded richer, more tailored insights. For instance, companies in resource-intensive sectors may prioritise environmental sustainability due to regulatory obligations, whereas firms in financial or service-oriented sectors may emphasise social and governance aspects. Exploring such differences could allow for more sector-specific ESG strategies and policy recommendations.

Lastly, the study encountered limitations related to data availability for certain financial performance metrics, such as Return on Assets (ROA), dividend yields, and leverage. While these variables are frequently used in the empirical literature to control for financial health and capital structure, they were inconsistently reported among the selected firms and were therefore omitted from the final analysis. Their absence may have limited the analytical depth and scope of the study, as they could have offered additional dimensions to the ESG–performance relationship.

Future research could address these limitations by expanding the dataset to include a larger number of firms, incorporating additional financial performance indicators, and investigating sector-specific dynamics. Such efforts would contribute to a more comprehensive understanding of how ESG activities influence financial outcomes in the South African context.

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