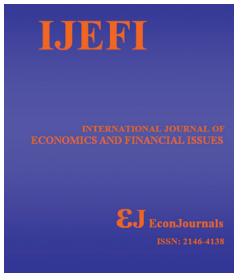


International Journal of Economics and Financial Issues

ISSN: 2146-4138

available at http: www.econjournals.com

International Journal of Economics and Financial Issues, 2026, 16(1), 64-72.

Environmental, Social and Governance Practices and Corporate Financial Performance: Evidence from Johannesburg Stock Exchange Listed Firms

Justin J Bendeman, Sibanisezwe A Khumalo*, Sandile Phakathi

Department of Economics, Rhodes University, Makhanda, Eastern Cape, South Africa. *Email: s.khumalo@ru.ac.za

Received: 05 September 2025 **Accepted:** 02 December 2025 **DOI:** https://doi.org/10.32479/ijefi.22113

ABSTRACT

This study investigates the relationship between environmental, social, and governance (ESG) practices and corporate financial performance (CFP) among firms listed on the Johannesburg Stock Exchange (JSE) from 2007 to 2021. Using difference-in-difference (DiD), fully modified ordinary least squares (FMOLS), and quantile regression approaches, the analysis evaluates both accounting-based and market-based performance indicators, including return on assets, return on equity, Tobin's Q, and share returns. Results reveal a negative association between ESG scores and accounting measures of profitability but a positive link with market valuation and share returns. High-ESG "leader" firms outperform their peers, suggesting that financial benefits accrue primarily to firms that engage deeply in sustainability practices. Sectoral analysis highlights that secondary-sector firms experience stronger ESG-related gains compared to primary-sector firms. The findings contribute to the emerging-market literature by providing robust empirical evidence from South Africa and offer insights for policymakers, investors, and corporate managers seeking to align sustainability with financial performance.

Keywords: Environmental, Social and Governance, Corporate Financial Performance, Johannesburg Stock Exchange, Emerging Markets, Difference-in-Difference, Quantile Regression
JEL Classifications: G30, G32, M14, Q56, O16

1. INTRODUCTION

Corporate financial performance (CFP) summarises the economic outcomes achieved by a firm. Traditional evaluations of CFP rely measures such as return on assets (ROA), return on equity (ROE), stock returns and the ratio of market value to book value (Tobin's Q), either accounting or market-based (Achim et al., 2016; Ferrero-Ferrero et al., 2016; Galant and Cadez, 2017; Kusumawardani et al., 2021). These metrics guide investment decisions, yet in recent years non-financial factors have gained prominence. In particular, environmental, social and governance (ESG) practices have become a key consideration for investors and regulators. As capital allocators increasingly demand transparency and responsibility, debates have intensified over whether ESG considerations enhance or detract from firm performance (Matos, 2020). Two opposing theoretical perspectives frame this debate. Milton Friedman's shareholder theory contends that corporate social initiatives distract managers from the primary duty of maximising shareholder wealth (Friedman, 1970), whereas stakeholder theory holds that firms create long-term value by addressing the needs of a broad set of stakeholders (Freeman, 1984).

ESG has roots in the broader notion of corporate social responsibility (CSR). The concept of CSR dates to the early 1950s (Campbell, 2000; Samkin et al., 2014; Abdillah and Husin, 2016; Cini and Ricci, 2018; Kewlani and Bhatt, 2019; Chu et al., 2022) when Bowen (2013) argued that businesses have responsibilities beyond profit maximisation. Subsequent decades saw widespread adoption of CSR initiatives and debates on the necessity of such initiatives. ESG emerged in the mid-2000s as an attempt to

operationalise CSR through measurable indicators. Ribando and Bonne (2010) describe ESG simply as a score capturing a firm's performance on environmental, social and governance dimensions. Li et al. (2021) emphasise that ESG is a measurement framework, not a synonym for CSR, and Garcia et al. (2017) define ESG performance as a firm's success or failure in producing positive environmental, social and governance outcomes. These scores synthesise tangible data such as carbon emissions and board composition alongside intangible factors like brand reputation and human capital development (Escrig-Olmedo et al., 2019). In this paper, Li et al.'s (2021) definition is adopted and ESG is treated as a quantified measure of sustainability performance. CSR is discussed only in the literature review where relevant studies use CSR and ESG interchangeably.

The literature offers mixed evidence on the ESG–CFP relationship. Studies conducted in developed markets often find that firms with superior ESG performance realise higher profitability when CFP is measured using accounting metrics such as ROA or ROE (Fischer and Sawczyn, 2013; Mahoney and Roberts, 2007; Moneva and Ortas, 2010). Results are more ambiguous when CFP is assessed using market-based measures or a combination of metrics. Emerging-market research likewise reports predominantly positive ESG–CFP relationships when using accounting measures (Kumar and Firoz, 2022; Teng et al., 2022; Zhao et al., 2018) but mixed findings for market-based measures (Chelawat and Trivedi, 2016; Dalal and Thaker, 2019). South African evidence is limited and inconsistent: some studies analyse socially responsible investment (SRI) indices (Chetty et al., 2015; Du Toit and Lekoloane, 2018), others investigate integrated reporting and corporate governance (Mans-Kemp and Van der Lugt, 2020), and a handful consider ESG scores directly (Johnson et al., 2019). These studies typically involve small samples and short periods, leaving important questions unanswered.

Given these gaps, the current study assesses whether ESG practices improve the financial performance of firms listed on the Johannesburg Stock Exchange (JSE). Specifically, the study compares the performance of adopters versus non-adopters of ESG, examines whether "leader" firms with high ESG scores outperform "laggards," and tests whether the effect of ESG varies across industries and quantiles of the performance distribution. By drawing on a long panel of JSE firms from 2007 to 2021 and applying difference-in-difference (DiD), fully modified ordinary least squares (FMOLS) and quantile regression techniques, the study provides robust evidence relevant to investors and corporate decision-makers.

1.1. The South African ESG Context

ESG in South Africa is shaped by a unique legislative and governance framework. Several acts and regulations address environmental protection, social justice and corporate governance for JSE-listed companies. Table 1 summarises selected legislation. South Africa has also been a pioneer of responsible investment in emerging markets (Viviers and Els, 2017). The Code for Responsible Investing in South Africa (CRISA), launched in 2011, encourages investors to integrate ESG considerations into investment processes (Institute of directors of Southern Africa, 2011 and 2016; Foster, 2020:149). The King IV corporate governance code emphasises integrated thinking, stakeholder inclusivity and corporate citizenship, urging boards to consider environmental and social impacts as part of strategy.

Investors in South Africa thus operate under a framework that both mandates and encourages sustainable practices. However, Daugaard and Ding (2022) argue that ESG scores are sensitive to regional context, underscoring the need to examine South African data separately. Moreover, Mans-Kemp and Viviers (2016) highlight that numerous laws create obligations in the environmental, social and governance spheres.

2. LITERATURE REVIEW

2.1. ESG–CFP Evidence from Developed and Emerging Markets

The relationship between ESG practices and financial performance has been widely studied, yet findings remain inconclusive. In developed markets, studies employing accounting-based measures often report a positive relationship; high ESG scores are associated with higher ROA and ROE (Mahoney and Roberts, 2007; Moneva and Ortas, 2010; Fischer and Sawczyn, 2013; Naimy et al., 2021). However, evidence based on market-based measures such as stock returns or Tobin's Q is mixed (Hussain et al., 2018). Some authors report positive market reactions to superior ESG performance (Aybars et al., 2019), while others find neutral or even negative effects (Velte, 2017). Wang and Sarkis (2017) highlight that results vary by industry and ESG dimension.

Emerging-market studies show a similar pattern. Accounting measures tend to be positively related to ESG scores (Zhao et al., 2018; Giese et al., 2019; Kumar and Firoz, 2022; Teng et al., 2022). Market-based measures yield mixed results; for instance, Chelawat and Trivedi (2016) find no significant relationship

Table 1: Selected legislation relevant to ESG in South Africa

Environmental legislation	Social legislation	Governance legislation
Environmental Conservation Act (1989)—establishes principles for biodiversity and resource management	Broad-Based Black Economic Empowerment Act (2003)—promotes transformation and economic inclusion	Pension Funds Act (1956), Regulation 28—requires pension funds to consider sustainability in investment decisions
National Environmental Management Act (1998)—provides a framework for environmental management	Unemployment Insurance Act (2001)—protects employees' welfare	Companies Act (2008)—codifies directors' duties and stakeholder considerations
National Water Act (1998)—regulates water resources	Basic Conditions of Employment Act (1997)	National Credit Act (2005)
The Constitution, Section 24—entitles citizens to an environment that is not harmful to health or well-being	Skills Development Act (1998)—safeguard labour rights and promote skills	Consumer Protection Act (2008)—ensure fair treatment of consumers

Source: Adapted from Mans-Kemp and Viviers (2016)

between ESG and market value for Indian firms, whereas Naimy et al. (2021) report a positive link in the Middle East. The differences may reflect heterogeneity in ESG disclosure standards, investor expectations and institutional contexts.

2.2. Evidence from South Africa

In South Africa the literature is sparse. Studies have primarily focused on constituents of socially responsible investment indices (Chetty et al., 2015; Du Toit and Lekoloane, 2018), integrated reporting (Mans-Kemp and Van der Lugt, 2020) and specific ESG pillars (Mans-Kemp, 2014). Only a few examine ESG scores directly. Johnson et al. (2019) note that ESG impacts vary across industries. Muzanya (2022) documents significant sectoral differences, suggesting that results cannot be generalised across the entire exchange. Common limitations of these studies include short time horizons and small sample sizes.

2.3. Theoretical Perspectives

The equivocal evidence has prompted researchers to invoke competing theories (Ferrell et al., 2016: p. 585). Shareholder theorists (Friedman, 1970) argue that ESG investments divert resources from core profit-generating activities, thereby depressing returns. Empirical studies reporting negative ESG–CFP relationships (e.g., Velte, 2017) align with this view. In contrast, stakeholder theorists (Freeman, 1984) posit that engaging with employees, customers, suppliers and communities enhances competitiveness and mitigates risk (Jones, 1995: p. 430). ESG practices can, for example, reduce regulatory fines, lower energy costs and attract talent, thereby improving capital and cash flows (Cheng et al., 2014; Henisz et al., 2019). Berman et al. (1999) and Marom (2006) describe cash flow and idiosyncratic channels through which ESG adoption may enhance profitability and reduce downside risk. The possibility that ESG has a non-linear effect yielding benefits only once a critical intensity is reached has also been proposed (Barnett and Salomon, 2012). The analysis draws on these theories when interpreting empirical results.

3. DATA AND METHODOLOGY

3.1. Sample and ESG Scoring

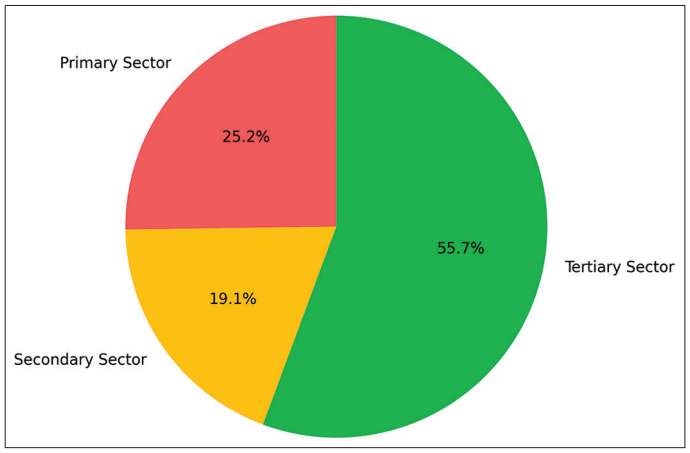
The study uses panel data for 115 JSE-listed companies between 2007 and 2021. Firms are classified into the primary (29 firms), secondary (22 firms) and tertiary (64 firms) sectors based on the firms' economic activities (Miles, 2008). Figure 1 illustrates the sector composition.

ESG scores are obtained from the Thomson Reuters Refinitiv database. Scores range between 0 and 1 and measure both relative performance and transparency of ESG reporting. Following industry practice, firms are classified as laggards, average performers and leaders based on score ranges. Table 2 provides the classification.

3.2. Variables

The dependent variables measure financial performance. Return on assets (ROA) equals net income divided by total assets. Return on equity (ROE) equals net income divided by average shareholders' equity. Annual stock return is the year-on-year percentage change in share price. Tobin's Q equals the total market value of a firm divided by the replacement value of its assets. Control variables include market capitalisation (the natural logarithm of the market value of equity) and financial leverage (total debt divided by total assets). Dummy variables identify whether a firm belongs to the primary or secondary sector; tertiary firms constitute the base category. Table 3 summarises the variables and formulas.

Figure 1: Sector composition of the study sample. Pie chart of sector composition



Source: Author's calculations using data from Thomson Reuters Refinitiv

Table 2: ESG score classification

Score range	Grade description	Category
0-0.08333	D−: Poor ESG performance and insufficient transparency	Laggards
0.08333-0.16667	D	laggards
0.16667-0.25	D+	laggards
0.25-0.33333	C−	
0.33333-0.41667	C: Satisfactory performance and moderate transparency	Average
0.41667-0.5	C+	
0.5-0.58333	B−	
0.58333-0.66667	B	
0.66667-0.75	B+	
0.75-0.83333	A−	Leaders
0.83333-0.91667	A: Excellent performance and high transparency	Leaders
0.91667-1	A+	Leaders

Companies in the top three grades (A−, A, A+) are designated leaders, those in the bottom three grades are laggards, and the rest are average

3.3. Correlation Analysis

Before estimating regression models, correlations among the variables are examined. ROA and ROE are highly correlated ($r \approx 0.76$), as are ROA and Tobin's Q ($r \approx 0.69$). Findings reporting similar results to various studies, (Alareeni and Hamdan, 2020; Al-Lozi and Obeidat, 2016; Ghodrati et al., 2014; Haghiri and Haghiri, 2012). Both accounting measures are positively correlated with share returns, suggesting that past profitability influences current market valuations. Larger firms (higher market capitalisation) tend to exhibit higher financial performance and lower unsystematic risk. ESG scores exhibit weak negative correlations with ROA, ROE, Tobin's Q and share returns, and a positive correlation with market capitalisation. The pattern hints that firms with higher ESG scores may be larger yet not necessarily more profitable, motivating the multivariate analysis.

Firms with larger ROA are more likely to be found in the primary and secondary sectors, whilst firms with larger ROE and Tobin's Q are more likely only to be found in the secondary sector.

Furthermore, firms in the primary sector have a positive correlation to ESG while firms in the secondary and tertiary sectors have a negative correlation with ESG, which is interesting as primary sector firm business operations involve extraction of natural resources. Khan et al. (2016) speaks to materiality of the aspects being reported as one consideration for these findings. The primary sector's environmental materiality has greater impact on ESG scores for the primary sector when compared to the secondary and tertiary sectors. A second consideration relates to the complexities of the Social and Governance issues for the secondary and tertiary sector, bringing in the argument by Berg et al. (2022). That study points to the subjectivity of ratings that creates divergence.

3.4. Econometric Framework

To evaluate the effect of ESG practices on CFP, three complementary models are estimated:

1. Difference-in-difference (DiD) analysis. Firms that adopt ESG (treatment group) are compared with those that do not (control group) before and after adoption. The DiD specification tests whether adoption leads to a change in performance metrics.
2. Fully modified ordinary least squares (FMOLS). FMOLS accounts for possible endogeneity and serial correlation in dynamic panel data by modifying ordinary least squares estimators (Phillips and Hansen, 1990). Separate models are estimated for four dependent variables (ROA, ROE, Tobin's Q and share return) and include indicators for leader and laggard firms; control variables are market capitalisation, financial leverage and sector dummies.
3. Quantile regression. Because the impact of ESG may differ across the distribution of financial performance, quantile regression is applied to estimate effects at different quantiles (e.g., median vs. upper tail). Diagnostics from the FMOLS residuals indicate heteroscedasticity and serial correlation, supporting the use of quantile regression.

All variables were tested for stationarity using augmented Dickey–Fuller and Phillips–Perron tests. ROA, Tobin's Q, ESG, market capitalisation and financial leverage are integrated of order 1, while ROE and share returns are stationary in levels see appendix A.

4. RESULTS AND DISCUSSION

4.1. Difference-in-Difference Results

Table 4 reports the estimated DiD coefficients for each CFP measure. Positive (negative) coefficients indicate improvements (deteriorations) in financial performance following ESG adoption.

The DiD results show that, on average, ESG adoption increases ROA, Tobin's Q and share returns but decreases ROE. The positive ROA coefficient implies that adopters become more efficient—either net income rises or total assets decline. The negative effect on ROE suggests that average equity increases faster than net income, consistent with firms reducing liabilities (i.e., risk) faster than assets. Higher Tobin's Q and share returns indicate that investors reward ESG adoption, consistent with stakeholder theory.

4.2. FMOLS Results

Table 5 summarises the FMOLS estimates. Columns correspond to the four dependent variables. Coefficients on the ESG score capture the marginal effect of an incremental increase in ESG on financial performance, while the "Leader" and "Laggard" dummy variables measure the performance differential between leader or laggard firms and average performers.

Several findings emerge. First, the coefficient on the ESG score is negative for ROA and ROE but positive for Tobin's Q unlike Saygili et al., (2022). These findings indicate that, holding other factors constant, incremental improvements in ESG scores reduce accounting profitability but increase market valuation (Janicka and Sajnóg, 2022; Cheng et al., 2014). Second, leader firms significantly outperform average firms on ROA, ROE and share returns, whereas laggards underperform across all measures. For example, a 1% increase in ESG scores raises ROA by 0.9% points

Table 3: Variable definitions

Variable	Description	Formula/measurement
ESG score	Relative ESG performance and transparency	Ordinal and numerical score from Thomson Reuters
Return on assets (ROA)	Profitability relative to assets	Net income÷total assets
Return on equity (ROE)	Profitability relative to shareholders' equity	Net income÷average equity
Annual stock return	Market-based measure of performance	(Share pricet–share pricet−1) ÷ share pricet−1
Tobin's Q	Market value relative to asset replacement cost	Total market value of firm÷total asset value
Market capitalisation	Firm size	Natural log of market value of outstanding shares
Financial leverage	Firm risk	Total debt÷total assets
Sector dummies	Industry classification	Primary=1 if firm extracts raw materials; secondary=1 if firm processes/manufactures; tertiary omitted

Table 4: Difference-in-difference estimates

Dependent variable (CFP measure)	Coefficient	Standard error	Interpretation
Return on assets (ROA)	0.302***	0.059	Adopting ESG increases ROA by~0.30% points, suggesting higher operating efficiency
Return on equity (ROE)	–3.574***	0.173	Adoption leads to a reduction in ROE, implying that equity grows faster than net income
Tobin's Q	0.0667***	0.004	Adoption raises Tobin's Q, indicating that market value grows relative to asset base
Annual stock return	14.614***	0.377	Adoption improves annual share returns by about 14.6% points

***P< 0.001, **P<0.01, *P<0.05. Standard errors are robust. Source: Author's calculations using Thomson Reuters data

for leader firms but reduces ROA by 0.09% points for laggards. Similarly, leader firms experience a 16.46%-point increase in share returns for a 1% increase in ESG, whereas laggards see a 0.16%-point decline. Third, firm size (market capitalisation) has a positive effect and financial leverage a negative effect on all measures, justifying the inclusion of these variables as controls.

4.3. Quantile Regression Results

To examine whether the ESG–CFP relationship differs across the distribution of financial performance, quantile regressions at the median (50th percentile) were estimated. Table 6 reports selected coefficients for the key variables. The diagnostic test for symmetry, slope equality and model stability supports the use of Quantile regression, See appendices B, C and D.

The quantile results confirm and extend the FMOLS findings. ESG scores negatively affect all performance measures at the median. Leader firms enjoy higher ROA and Tobin's Q, whereas laggards perform worse. Referring to appendices E and F, sectoral differences emerge secondary-sector firms experience positive ESG effects on ROA, ROE and Tobin's Q. ESG generally shows more consistent positive effects across low to mid quantiles for ROA, ROE, and Tobin's Q, with weaker or mixed effects at higher quantiles and for Share Return, while primary-sector coefficients are insignificant. Thus ESG's impact is not homogeneous across industries. ESG effects vary by quantile. Positive impacts appear for undervalued or mid-performing firms, while negative impacts are more common, Saygili et al., (2022) at high-performance quantiles (ROA, ROE, Tobin's Q). Larger firms and those with lower leverage perform better, echoing the FMOLS results.

5. DISCUSSION

The evidence paints a nuanced picture of the ESG–CFP nexus among JSE-listed companies. Overall, incremental improvements in ESG scores are associated with lower accounting profitability but higher market valuations. This finding lends partial support to shareholder theory: Diverting resources toward ESG initiatives may initially reduce profits. At the same time, the superior performance of leader firms and the market premium for higher ESG scores align with stakeholder theory. Firms that invest heavily in ESG appear to reap reputational benefits and risk reductions that translate into higher share returns and market valuations. In contrast, partial or superficial adoption yields negligible benefits and may even harm performance.

The divergent effects across measures illuminate underlying mechanisms. The negative ROE coefficient in the DiD model reflects an increase in equity relative to net income, consistent with a reduction in liabilities (Janicka and Sajnóg, 2022; Cheng et al., 2014). The negative ROE coefficient supports the idiosyncratic channel: ESG adoption decreases downside risk by lowering leverage and financial obligations. Essentially, they become financially more conservative, perhaps spending on ESG projects, or strengthening capital to support long-term sustainability (Xie et al., 2019).

Positive effects on Tobin's Q and share returns indicate that investors reward ESG leaders (Zhou et al., 2022; Xie et al., 2019), possibly because investors anticipate long-term gains greater impact (Giese et al., 2019), or perceive such firms as better managed. The negative relationship between ESG and ROA/ROE for average firms may stem from adjustment costs or the fact that ESG investment pays off only after reaching a critical threshold (Barnett and Salomon, 2012; Nollet et al., 2016). The inverted-U pattern observed in some studies suggests diminishing returns beyond a certain level of ESG implementation (Ferrero-Ferrero et al., (2016).

Sectoral heterogeneity underscores the importance of context. Secondary-sector firms (manufacturing and processing) benefit more from ESG initiatives than primary-sector firms, perhaps because environmental and labour issues are more salient in manufacturing. The observed sectoral differences are consistent with Johnson et al.

Table 5: FMOLS estimates of the ESG–CFP relationship

Variable	ROA	ROE	Tobin's Q	Share return
ESG score	−0.049 (0.041)	−0.310*** (0.041)	0.153*** (0.042)	−0.210*** (0.044)
Leader	0.898*** (0.056)	3.054*** (0.056)	−0.194*** (0.058)	16.460*** (0.060)
Laggard	−0.093* (0.045)	−0.360*** (0.045)	0.012 (0.045)	−0.163*** (0.045)
Market capitalisation (log)	10.85*** (0.053)	25.51*** (0.053)	0.95*** (0.054)	13.04*** (0.055)
Financial leverage	−23.76*** (0.039)	−25.69*** (0.039)	−1.21*** (0.039)	−31.41*** (0.041)

Standard errors in parentheses; ***P< 0.001, **P< 0.01, *P< 0.05. "Leader" and "Laggard" compare firms in the highest and lowest ESG categories to average performers.
Source: *Author's calculations

Table 6: Quantile regression estimates (median)

Variable	ROA	ROE	Tobin's Q	Share return
Constant	−10.71** (4.11)	−50.97*** (7.11)	−1.76*** (0.20)	−66.98*** (14.55)
ESG score	−0.114*** (0.015)	−0.247*** (0.028)	−0.0076*** (0.0009)	−0.265*** (0.050)
Leader	2.912* (1.402)	5.353 (2.767)	0.197* (0.099)	9.961* (4.388)
Laggard	−2.414* (1.125)	−9.391*** (2.010)	−0.149*** (0.038)	0.530 (3.983)
Market capitalisation (log)	2.474*** (0.441)	8.281*** (0.732)	0.291*** (0.022)	8.798*** (1.506)
Financial leverage	−10.38*** (1.425)	−14.28*** (3.970)	−0.616*** (0.081)	−16.20** (5.130)
Primary sector	0.0116 (0.0156)	−0.037 (0.027)	0.0013 (0.0010)	0.0007 (0.0546)
Secondary sector	0.0471** (0.0155)	0.1153** (0.0409)	0.0039* (0.0018)	−0.0069 (0.0490)

Standard errors in parentheses; ***P< 0.001, **P< 0.01, *P< 0.05. Quantile regressions estimated at the 50th percentile. Source: *Author's calculations

(2019) and Muzanya (2022), who argue that ESG disclosure and performance vary across industries, and signal to investors and managers that sector-specific ESG strategies may be necessary.

6. CONCLUSION, IMPLICATIONS AND FUTURE STUDIES

This study re-examined the ESG–CFP relationship for a comprehensive sample of JSE-listed firms over 2007-2021 using difference-in-difference, FMOLS and quantile regression methods. Several conclusions emerge. First, ESG adoption generally increases operating efficiency (ROA), market valuation (Tobin's Q) and share returns, but reduces return on equity because liabilities decline faster than assets. Second, incremental improvements in ESG scores yield mixed effects: negative for accounting measures and positive for market valuation. Third, leader firms—those with the highest ESG scores—consistently outperform average performers and laggards, suggesting that the benefits of ESG accrue only to firms that adopt sustainability practices intensively. Fourth, ESG effects vary by sector and across the distribution of performance.

For managers, the findings imply that merely adopting ESG is insufficient. To realise financial benefits firms should strive to become sector leaders in ESG performance. Investment in sustainability can reduce risk and enhance reputation, leading to higher share returns. Policies such as reducing leverage and improving transparency may complement ESG initiatives. Investors should consider both the intensity of ESG engagement and the firm's industry when evaluating potential investments.

Although comprehensive, the analysis has limitations. The study focuses on JSE-listed firms; results may not generalise to smaller firms or other emerging markets. ESG scores are treated as exogenous, yet the scores may be influenced by unobserved firm characteristics. Future research could employ instrumental-variable approaches or dynamic panel models to address endogeneity. Examining disaggregated ESG components (environmental, social and governance separately) and exploring long-term horizons could also yield additional insights.

REFERENCES

Abdillah, A.A., Husin, N.M. (2016), A longitudinal examination of corporate social responsibility reporting practices among top banks in Malaysia. Procedia Economics and Finance, 35, 10-16.

Achim, M.V., Borlea, S.N., Mare, C. (2016), Corporate governance and business performance: Evidence for the Romanian economy. Journal of Business Economics and Management, 17(3), 458-474.

Alareeni, B.A., Hamdan, A. (2020). ESG impact on performance of US S&P 500-listed firms. Corporate Governance: The International Journal of Business in Society, 20(7), 1409-1428.

Al-Lozi, N.M., Obeidat, G.S. (2016), The relationship between the stock return and financial indicators (profitability, leverage): An empirical study on manufacturing companies listed in Amman Stock Exchange. Journal of Social Sciences (COES&RJ-JSS), 5(3), 408-424.

Aybars, A., Ataünal, L., Gürbüz, A.O. (2019), ESG and financial performance: Impact of environmental, social, and governance issues on corporate performance. In: Handbook of Research on Managerial Thinking in Global Business Economics. United States: IGI Global. p520-536.

Barnett, M.L., Salomon, R.M. (2012), Does it pay to be really good? Addressing the shape of the relationship between social and financial performance. Strategic Management Journal, 33(11), 1304-1320.

Berg, F., Kölbel, J.F., Rigobon, R. (2022), Aggregate confusion: The divergence of ESG ratings. Review of Finance, 26(6), 1315-1344.

Berman, S.L., Wicks, A.C., Kotha, S., Jones, T.M. (1999), Does stakeholder orientation matter? The relationship between stakeholder management models and firm financial performance. Academy of Management Journal, 42(5), 488-506.

Bowen, H.R. (2013), Social Responsibilities of the Businessman. United States: University of Iowa Press.

Campbell, D.J. (2000), Legitimacy theory or managerial reality construction? Corporate social disclosure in Marks and Spencer PLC corporate reports, 1969-1997. Accounting Forum, 24(1), 80-100.

Chelawat, H., Trivedi, I.V. (2016), The business value of ESG performance: The Indian context. Asian Journal of Business Ethics, 5(1-2), 195-210.

Cheng, B., Ioannou, I., Serafeim, G. (2014), Corporate social responsibility and access to finance. Strategic Management Journal, 35(1), 1-23.

Chetty, S., Naidoo, R., Seetharam, Y. (2015), The impact of corporate social responsibility on firms' financial performance in South Africa. Contemporary Economics, 9(2), 193-214.

Chu, M., Muhamad, H.B., Mustapha, M.B., San, O.T., Zan, F., Jia, X. (2022), Research trends in corporate social responsibility and innovation: A bibliometric analysis. Sustainability, 14(21), 14185.

Cini, A.C., Ricci, C. (2018), CSR as a driver where ESG performance will ultimately matter. Symphonya. Emerging Issues in Management, 1, 68-75.

Dalal, K.K., Thaker, N. (2019), ESG and corporate financial performance: A panel study of Indian companies. IUP Journal of Corporate Governance, 18(1), 44-59.

Daugaard, D., Ding, A. (2022), Global drivers for ESG performance: The body of knowledge. Sustainability, 14(4), 2322.

Du Toit, E., Lekoloane, K. (2018), Corporate social responsibility and financial performance: Evidence from the Johannesburg Stock Exchange, South Africa. South African Journal of Economic and Management Sciences, 21(1), 1-11.

Escrig-Olmedo, E., Fernández-Izquierdo, M.Á., Muñoz-Torres, M.J. (2019), Socially responsible investing: A critical analysis of environmental, social and governance scoring systems. Sustainability, 11(4), 915.

Ferrell, A., Liang, H., Renneboog, L. (2016), Socially responsible firms. Journal of Financial Economics, 122(3), 585-606.

Ferrero-Ferrero, I., Fernández-Izquierdo, M.Á., Muñoz-Torres, M.J. (2016), The effect of environmental, social and governance consistency on economic results. Sustainability, 8(10), 1005.

Fischer, T.M., Sawczyn, A.A. (2013), The relationship between corporate social performance and corporate financial performance and the role of innovation: Evidence from German listed firms. Journal of Management Control, 24, 27-52.

Foster, R. (2020), The evolution and alignment of institutional shareholder engagement through the King and CRISA reports. Journal of Global Responsibility, 11(2), 147-153.

Freeman, R.E. (1984), Strategic Management: A Stakeholder Approach. Boston: Pitman.

Friedman, M. (1970), A theoretical framework for monetary analysis. Journal of Political Economy, 78(2), 193-238.

Galant, A., Cadez, S. (2017), Corporate social responsibility and financial performance relationship: A review of measurement approaches. Economic Research-Ekonomska Istraživanja, 30(1), 676-693.

Garcia, A.S., Mendes-Da-Silva, W., Orsato, R.J. (2017), Sensitive

industries produce better ESG performance: Evidence from emerging markets. Journal of Cleaner Production, 150, 135-147.
Ghodrati, H., Jabbari, H., Esfandyari, M. (2014), A study on relationship between assets' objectivity, ROA, ROE and ownership ratio with liquidity cycle. Management Science Letters, 4(6), 1341-1352.
Giese, G., Lee, L.E., Melas, D., Nagy, Z., Nishikawa, L. (2019), Foundations of ESG investing: How ESG affects equity valuation, risk and performance. Journal of Portfolio Management, 45(5), 69-83.
Haghiri, A., Haghiri, S. (2012), The investigation of effective factors on stock return with emphasis on ROA and ROE ratios in Tehran stock exchange (TSE), Journal of Basic and Applied Scientific Research, 2(9), 9097-9103.
Henisz, W., Koller, T., Nuttall, R. (2019), Five ways that ESG creates value. McKinsey Quarterly, 4, 1-12.
Hussain, N., Rigoni, U., Orij, R.P. (2018), Corporate governance and sustainability performance: Analysis of triple bottom line performance. Journal of Business Ethics, 149(2), 411-432.
Institute of Directors Southern Africa (IoDSA). (2011), Code for Responsible Investing in South Africa (CRISA). Available from: https://www.crisa2.co.za/4729-iodsa_crisa_code_2011_cover
Institute of Directors Southern Africa (IoDSA). (2016), King IV Report on Corporate Governance for South Africa. Available from: https://www.iodsa.co.za/page/AboutKingIV
Janicka, M., Sajnóg, A. (2022), The ESG reporting of EU public companies: Does the company's capitalisation matter? Sustainability, 14(7), 4279.
Johnson, R., Erasmus, P.D., Mans-Kemp, N. (2019), Assessing the business case for environmental, social and corporate governance practices in South Africa. South African Journal of Economic and Management Sciences, 22(1), 1-13.
Jones, T.M. (1995), Instrumental stakeholder theory: A synthesis of ethics and economics. Academy of Management Review, 20(2), 404-437.
Kewlani, M.H., Bhatt, K. (2019), A comparative study on corporate social responsibility practices in selected public and private sector banks in India. GAP Interdisciplinarities, 2(1), 89-98.
Khan, M., Serafeim, G., Yoon, A. (2016), Corporate sustainability: First evidence on materiality. The Accounting Review, 91(6), 1697-1724.
Kumar, P., Firoz, M. (2022), Does accounting-based financial performance value environmental, social and governance (ESG) disclosures? A detailed note on a corporate sustainability perspective. Australasian Accounting, Business and Finance Journal, 16(1), 1-33.
Kusumawardani, A., Haat, M.H.C., Saputra, J., Yusliza, M.Y., Muhammad, Z., Bon, A.T. (2021), A Review of Corporate Financial Performance Literature: A Mini-Review Approach. In: Proceedings of the 11th Annual International Conference on Industrial Engineering and Operations Management. p3980-3995.
Li, T.T., Wang, K., Sueyoshi, T., Wang, D.D. (2021), ESG: Research progress and future prospects. Sustainability, 13(21), 11663.
Mahoney, L.S., Roberts, R.W. (2007), Corporate social performance, financial performance and institutional ownership in Canadian firms. Accounting Forum, 31(3), 233-253.
Mans-Kemp, N. (2014), Corporate Governance and the Financial Performance of Selected Johannesburg Stock Exchange Industries [Doctoral Dissertation, Stellenbosch University].
Mans-Kemp, N., Viviers, S. (2016), Responsible investing in South Africa. In: Hebb, T., Hawley, J.P., Hoepner, A.G.F., Neher, A.L., Wood, D., editors. The Routledge Handbook of Responsible Investment. London: Routledge. p99-114.
Mans-Kemp, N., Van Der Lugt, C.T. (2020), Linking integrated reporting quality with sustainability performance and financial performance in South Africa. South African Journal of Economic and Management Sciences, 23(1), 1-11.
Marom, I.Y. (2006), Towards a unified theory of the CSR–financial performance link. Journal of Business Ethics, 67(2), 191-200.
Matos, P. (2020), ESG and Responsible Institutional Investing Around the World: A Critical Review. New York: CFA Institute Research Foundation.
Miles, I. (2008), Patterns of innovation in service industries. IBM Systems Journal, 47(1), 115-128.
Moneva, J.M., Ortas, E. (2010), Corporate environmental and financial performance: A multivariate approach. Industrial Management and Data Systems, 110(2), 193-210.
Muzanya, S. (2022), ESG and Corporate Financial Performance: Evidence from JSE Listed Firms [Master's Thesis, University of Cape Town].
Naimy, V., El Khoury, R., Iskandar, S. (2021), ESG versus corporate financial performance: Evidence from East Asian firms in the industrials sector. Studies of Applied Economics, 39(3), 1-27.
Natesan, P. (2020), The evolution and significance of the "apply and explain" regime in King IV. Journal of Global Responsibility, 11(2), 155-160.
Nollet, J., Filis, G., Mitrokostas, E. (2016), Corporate social responsibility and financial performance: A non-linear and disaggregated approach. Economic Modelling, 52, 400-407.
Phillips, P.C., Hansen, B.E. (1990), Statistical inference in instrumental variables regression with I(1) processes. Review of Economic Studies, 57(1), 99-125.
Ribando, J.M., Bonne, G. (2010), A New Quality Factor: Finding Alpha with ASSET4 ESG Data. Starmine Research Note. Toronto: Thomson Reuters.
Samkin, G., De Villiers, C., Pinto, S. (2014), Corporate social responsibility disclosures during the global financial crisis: New Zealand evidence. New Zealand Journal of Applied Business Research, 12(2), 33-49.
Saygili, E., Arslan, S., Birkan, A.O. (2022), ESG practices and corporate financial performance: Evidence from Borsa Istanbul. Borsa Istanbul Review, 22(3), 525-533.
Teng, X., Ge, Y., Wu, K.S., Chang, B.G., Kuo, L., Zhang, X. (2022), Too little or too much? Exploring the inverted U-shaped nexus between voluntary environmental, social and governance and corporate financial performance. Frontiers in Environmental Science, 10, 969721.
Thomson Reuters Refinitiv Eikon. (2023), Environmental, Social and Governance (ESG) Scores. Available from: https://www.refinitiv.com/content/dam/marketing/en_us/documents/methodolog y/refinitiv-esg-scores-methodology.pdf [Last accessed on 2023 Jul 28].
Velte, P. (2017), Does ESG performance have an impact on financial performance? Evidence from Germany. Journal of Global Responsibility, 8(2), 169-178.
Viviers, S., Els, G. (2017), Responsible investing in South Africa: Past, present and future. African Review of Economics and Finance, 9(1), 122-155.
Wang, L. (2017), Essays of the Pollution Effects on Sustainable Economic Development [Doctoral Dissertation, The University of Texas Rio Grande Valley].
Wang, Z., Sarkis, J. (2017), Corporate social responsibility governance, outcomes, and financial performance. Journal of Cleaner Production, 162, 1607-1616.
Xie, J., Nozawa, W., Yagi, M., Fujii, H., Managi, S. (2019), Do environmental, social, and governance activities improve corporate financial performance? Business Strategy and the Environment, 28(2), 286-300.
Zhao, C., Guo, Y., Yuan, J., Wu, M., Li, D., Zhou, Y., Kang, J. (2018), ESG and corporate financial performance: Empirical evidence from China's listed power generation companies. Sustainability, 10(8), 2607.
Zhou, G., Liu, L., Luo, S. (2022), Sustainable development, ESG performance and company market value: Mediating effect of financial performance. Business Strategy and the Environment, 31(7), 3371-3387.

APPENDIXS

Appendix A: Unit root tests

Variables	Level (Fisher-ADF test)		1st difference		Integrated order
	Intercept	Intercept and trend	Intercept	Intercept and trend	
ROA	362.006***	271.190	640.468***	497.136***	I (1)
ROE	458.142***	364.538***	709.730***	556.495***	I (0)
TobinQ	246.472	239.748	588.485***	489.957***	I (1)
Share (R)	434.265***	371.763***	918.983***	713.202***	I (0)
ESG	308.428***	192.3239	469.901***	387.083***	I (1)
Variables	**Level (IM-Pesaran-Shin test)**		**1st difference**		**Integrated order**
	Intercept	**Intercept and trend**	**Intercept**	**Intercept and trend**	
ROA	4.79594***	0.64594	14.2085***	−9.10738***	I (1)
ROE	−44.5995***	−23.7762***	−32.4916***	−16.2147***	I (0)
TobinQ	−0.60976	0.68130	−12.8245***	−7.68320***	I (1)
Share (R)	−24.9265***	−23.0608***	−37.1759***	−22.9101***	I (0)
ESG	−8.09768***	−2.45420	−12.1924***	−8.55407***	I (1)
Mkt Cap Log	−3.64793***	3.95592	−10.5051***	−7.67700***	I (1)
Fin Lev	−0.54460	1.13434	−10.1884***	−4.45908***	I (1)

Appendix B: Quantile tests for symmetry

Test statistic	CFP measurement			
	Model 1 (ROA)	Model 2 (ROE)	Model 3 (TobinQ)	Model 4 (Share return)
Chi-Sq. Statistic	136.6389***	129.0441***	199.4616***	36.78348

Appendix C: Quantile test for slope equality

Test statistic	CFP measurement			
	Model 1 (ROA)	Model 2 (ROE)	Model 3 (TobinQ)	Model 4 (Share return)
Chi-Sq. Statistic	415.2425***	232.9580***	601.3471***	113.6743***

Appendix D: Ramsey RESET (Stablity)

Test statistic	CFP measurement			
	Model 1 (ROA)	Model 2 (ROE)	Model 3 (TobinQ)	Model 4 (Share return)
QLR L-statistic	0.021466	0.74427	9.508073**	2.152765

Significance level is shown as follows: ***P<0.001, **P<0.01, *P<0.05.
Source: EViews output using Thomson Reuters Refinitiv Eikon (2023)

Appendix E: Quantile primary sector

Primary ESG	Quantile	ROA	ROE	TobinQ	Share Return
	0.1	-0.03736*	-0.15719***	0.003518***	-0.147993
		(0.025756)	(0.04176)	(0.000542)	(0.075811)
	0.2	0.003306**	-0.1342***	0.004761***	-0.112365*
		(0.012496)	(0.023601)	(0.000618)	(0.056415)
	0.3	0.028687	-0.11543***	0.003411***	-0.101483
		(0.011648)	(0.023183)	(0.000953)	(0.049133)
	0.4	0.03692	-0.06801*	0.001417	-0.037764*
		(0.013217)	(0.027691)	(0.00096)	(0.052148)
	0.5	0.011575	-0.03744	0.00134	0.00068
		(0.015583)	(0.027014)	(0.000986)	(0.054508)
	0.6	0.021096	-0.03276	-0.00038	0.036796
		(0.016332)	(0.029362)	(0.00116)	(0.063108)
	0.7	0.006835	-0.09423**	-0.00243	0.111018
		(0.017168)	(0.033325)	(0.001642)	(0.081938)
	0.8	-0.0231***	-0.12885***	-0.00535*	0.490175
		(0.019472)	(0.037126)	(0.001738)	(0.066926)
	0.9	-0.04849***	-0.03304	-0.00903***	-0.024093*
		(0.029252)	(0.05522)	(0.002324)	(0.228805)

Appendix F: Quantile secondary sector

Secondary ESG	Quantile	ROA	ROE	TobinQ	Share Return
	0.1	0.07949***	0.101468*	0.003891***	0.067891*
		(0.016335)	(0.041931)	(0.000652)	(0.114566)
	0.2	0.082943***	0.079644**	0.005302***	0.033447
		(0.010787)	(0.029164)	(0.0007)	(0.054996)
	0.3	0.089342*	0.078453**	0.00328**	-0.010656
		(0.010127)	(0.025875)	(0.001031)	(0.047345)
	0.4	0.07739*	0.089944**	0.002163	-0.006936
		(0.012058)	(0.030226)	(0.001192)	(0.046159)
	0.5	0.047123*	0.115259**	0.0039*	-0.045328
		(0.015475)	(0.040907)	(0.001755)	(0.048951)
	0.6	0.055854	0.174595**	0.005211**	-0.051238
		(0.019831)	(0.063774)	(0.001759)	(0.055983)
	0.7	0.04977	0.205156***	0.003809	-0.045934
		(0.019187)	(0.049219)	(0.002283)	(0.066546)
	0.8	0.005096	0.237106***	0.002639	0.014957
		(0.019932)	(0.048659)	(0.002746)	(0.087362)
	0.9	-0.01021	0.178396**	0.00239	0.032446
		(0.033306)	(0.057893)	(0.003779)	(0.093987)