

The Moderating Effect of Size of the Bank on the Relationship Between Environmental, Social, and Governance (ESG) Practices and the Financial Performance of Listed Commercial Banks in Africa

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Abstract

This study investigated the moderating effect of bank size on the relationship between Environmental, Social, and Governance (ESG) practices and the financial performance of listed commercial banks in Africa. Panel data were collected for fifteen banks across South Africa, Egypt, and Morocco over ten years (2013–2022), with ESG pillar scores sourced from the London Stock Exchange Group database and financial performance proxied by Return on Assets (ROA). Using fixed effects regression with lagged ESG variables, bank size (log of total assets) was tested as a moderator, while a Covid-19 dummy captured 2020–2021 shocks. Results from the baseline moderation model show that Environmental Score ($\beta = 0.0001823$, $p = 0.005$) and Governance Score ($\beta = 0.0001298$, $p < 0.001$) had significant positive effects on ROA, while Social Score ($\beta = 0.0000074$, $p = 0.629$), bank size ($\beta = 0.0003479$, $p = 0.216$), and Covid-19 ($\beta = -0.000534$, $p = 0.995$) were insignificant. The model explained 56.1% of the variation in profitability (R^2 overall = 0.5608, $F(5,130) = 15.41$, $\text{Prob} > F = 0.000$). In the extended interaction model, environmental ($\beta = 0.000202$, $p = 0.004$) and governance ($\beta = 0.000226$, $p < 0.001$) effects remained significant, while social turned negative and insignificant ($\beta = -0.000062$, $p = 0.131$). Crucially, the governance $\times$ size interaction was significant and negative ($\beta = -0.0000048$, $p = 0.003$), suggesting that the profitability benefits of governance weaken in larger banks. Interactions involving environmental ($\beta = -0.000003$, $p = 0.246$) and social ($\beta = 0.00000615$, $p = 0.079$) were statistically insignificant. The interaction model explained 59.6% of profitability variation (R^2 overall = 0.5957, $F(8,127) = 11.75$, $\text{Prob} > F = 0.000$). The findings demonstrate that while environmental and governance practices consistently enhance financial performance, their effects are not uniform across bank sizes. Specifically, larger banks face diminishing governance-related gains, highlighting the importance of streamlining governance structures in large institutions and strengthening ESG disclosure standards across African markets.

Keywords: *Governance, Financial Performance, Return on Assets (ROA), Environmental, Social and Governance Practices (ESG)*

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1. Introduction

Commercial banks play a fundamental role in ensuring financial stability both at the national and global levels. Their contributions to the economy include the provision of credit, liquidity, and investment opportunities to governments, households, and business enterprises (Batae, Dragomir, & Feleaga, 2020; Kalpana & Rao, 2017). In developing economies, particularly those that are agricultural-based, the banking sector sustains production and trade by offering credit facilities to farmers and agricultural enterprises, thereby fostering economic resilience (Jadhav, 2020). The financial performance of banks, therefore, becomes an important determinant of broader economic growth and fiscal sustainability. For instance, in Kenya, the thirty-eight largest banks contributed 129.52 billion shillings in tax revenue in 2021, which represented 6.82 percent of the total national tax receipts (PwC, 2022). At the same time, the value of total assets in the sector grew from 48.7 billion US dollars in 2020 to 51.2 billion US dollars in 2021, which illustrates a 5.1 percent growth rate (Maluki, 2021). Such outcomes highlight the significant role of consistent profitability and capital growth in ensuring stability within the financial system (Financial Sector Regulators, 2022).

Globally, banking performance has experienced considerable fluctuations since the 2008 financial crisis. The sector struggled to recover in the immediate aftermath of the crisis and later faced further shocks during the COVID-19 pandemic. Nonetheless, by 2021 and 2022, many banks had demonstrated remarkable resilience by adopting adaptive strategies that cushioned them against macroeconomic instability (Global Banking Annual Review, 2023; McKinsey, 2022). The African context reflected a similar trend, although profitability levels steadily declined between 2016 and 2020, particularly in major markets such as Kenya, Nigeria, South Africa, Morocco, and Egypt (McKinsey, 2022). In Kenya, the average return on equity declined from 30 percent in 2012 to 14 percent in 2020, while return on assets remained relatively stable at 5 percent (CBK, 2021). The modest recovery observed between 2021 and 2022 reaffirmed the ability of banks to withstand shocks, although questions remain regarding the drivers of sustainable long-term performance.

The concept of Environmental, Social, and Governance (ESG) practices has moved from a voluntary corporate social responsibility activity to a strategic requirement that shapes long-term competitiveness. ESG encompasses environmental stewardship, social responsibility, and governance integrity (PwC, 2023). The environmental dimension refers to the policies and actions that mitigate ecological risks, conserve resources, and support climate resilience, such as energy efficiency, carbon reduction, and waste management (Dragomir, 2018; S&P Global, 2019). The social dimension involves the treatment of employees, customers, and communities, with emphasis on inclusivity, workplace safety, human rights, and community welfare (Miralles-Quirós & Hernández, 2019). The governance dimension highlights board structure, shareholder rights, disclosure standards, and mechanisms that align the interests of management and owners (Youssef & Diab, 2021).

In banking, these pillars manifest in different ways. Environmental considerations appear in credit risk assessment and lending policies to high-emission industries (Scholtens, 2009; Gangi

et al., 2019). Social practices foster loyalty by reassuring customers that banks are committed to ethical service delivery and community investment (Shen et al., 2016). Governance mechanisms ensure accountability and transparency in decision-making and are reinforced by regulatory frameworks such as those issued by the Central Bank of Kenya and the Nairobi Securities Exchange (CBK, 2021; NSE, 2021). These institutions have introduced disclosure and reporting standards that make ESG compliance a statutory expectation.

Bank financial performance can be measured using internal accounting metrics such as Return on Assets (ROA) and market-based measures such as Tobin's Q and the Price-to-Book ratio (Kramarić et al., 2020). ROA reflects profitability relative to asset utilization, while Tobin's Q and similar indicators capture investor perceptions of future earnings capacity and risk. Research has shown that ESG practices affect these metrics differently, where positive associations are sometimes evident for market-based measures but not for internal accounting measures, or vice versa (Dolenc, Stubelj, & Laporšek, 2012; Awadzie et al., 2022; Ponce & Wibowo, 2023). The cyclic volatility of bank returns globally further emphasizes the need to identify institutional features, such as ESG adoption and bank size, that could stabilize returns over time (Kabajeh et al., 2012; McKinsey, 2022).

Although ESG integration is advancing globally, disclosure practices across Africa remain inconsistent. Approximately 145 commercial banks are listed on twenty-two securities exchanges in Africa, yet only a small subset provides complete and standardized ESG data that meet international comparability thresholds (ADBG, 2022; ASEA, 2023; Ozili, 2017). The London Stock Exchange Group (LSEG) has reported that only fifteen banks across South Africa, Morocco, and Egypt consistently disclosed ESG information between 2013 and 2022 (LSEG, 2023; Berg, Fabisik, & Sautner, 2021). In Kenya, only seven banks had published sustainability reports by 2022, and none were included in the global LSEG ESG database (KBA, 2022). Despite these limitations, ESG reporting is becoming increasingly relevant because investors and development agencies are prioritizing sustainability metrics in their funding decisions (PwC, 2023).

Empirical studies on ESG and bank performance in Africa and elsewhere have yielded contradictory findings. Some research shows a positive relationship (Buallay, 2019; Ofori, Nyuur, & Darko, 2014; Cornett, Erhemjamts, & Tehranian, 2016; Kimilu, 2023), while others indicate negative or insignificant relationships (Mathuva & Kiweu, 2016; Dragomir et al., 2022; Elisa & Guido, 2023). The evidence also suggests that results vary across measures such as ROA, ROE, and Tobin's Q, as well as across countries and time periods (Chetty, Naidoo, & Seetharam, 2015; Hedström & Dahlsjö, 2023; Soana, 2024). This inconsistency signals that mediating or moderating variables may condition the relationship between ESG and financial outcomes.

Bank size is most commonly measured by the natural logarithm of total assets (Korkmaz & Nur, 2023). Larger banks typically benefit from economies of scale that allow them to spread operational costs, undertake technological investments, and pursue innovation at a lower average cost than smaller banks (Niresh & Velnampy, 2014). They also attract higher investor confidence and are better positioned to absorb shocks, thereby enhancing long-term profitability (Akinyomi & Olagunju, 2013). From the Slack resources perspective, larger banks possess superior financial, human, and technological capacity to implement ESG initiatives effectively and to manage the associated reporting and compliance costs (Xiao, 2018). Their

greater visibility also increases stakeholder scrutiny, which strengthens incentives to pursue credible ESG practices (Grove et al., 2011). Smaller banks, on the other hand, may face resource constraints that limit the depth and quality of their ESG implementation.

In light of these dynamics, this study aims to establish the moderating effect of bank size on the relationship between ESG practices and the financial performance of listed commercial banks in Africa. The study is therefore positioned to fill an important gap in African banking research, where disclosure practices are still evolving and where profitability pressures make it essential to clarify the conditions under which ESG adoption translates into superior financial outcomes (CBK, 2021; NSE, 2021; LSEG, 2023).

1.1 Problem Statement

The stability of the banking sector is directly linked to national and global economic resilience because banks are the backbone of financial intermediation, capital allocation, and risk management (Abisola, 2021; Maluki, 2021). Consistent profitability and sustained firm value underpin this stability, since poorly performing banks are more vulnerable to collapse, mergers, or delisting (Kroes & Manikas, 2014; Gitagia, Wamugo, & Omagwa, 2020). Despite the centrality of financial performance, recent global evidence indicates persistent downward trends in bank profitability. Between 2013 and 2020, the global return on assets fell from 3.7 percent to 1.36 percent before showing a modest recovery after 2021 (Global Finance, 2023). In Africa, banking markets in Egypt, Kenya, Morocco, Nigeria, and South Africa have recorded a steady two-percentage-point annual decline in ROA since 2016, with Kenya's return on equity decreasing from 30 percent in 2012 to about 14 percent in 2020 (CBK, 2021; McKinsey, 2022). Such erosion of returns exposes fragility in Africa's banking sector and signals the urgency of adopting strategies that can restore sustainable profitability and value creation.

At the same time, banks are under growing pressure from regulators, investors, and civil society to integrate Environmental, Social, and Governance (ESG) principles into their operations (PwC, 2023; CBK, 2021). ESG adoption, while capable of enhancing long-term competitiveness, involves significant compliance and implementation costs. Although some studies demonstrate that ESG improves financial performance (Buallay, 2019; Cornett, Erhemjamts, & Tehranian, 2016; Ofori, Nyuur, & Darko, 2014), others reveal neutral or negative associations (Dragomir et al., 2022; Mathuva & Kiweu, 2016; Elisa & Guido, 2023). This divergence raises critical questions about the conditions under which ESG practices translate into financial benefits for banks, particularly in African markets where disclosure standards remain inconsistent and often voluntary (LSEG, 2023; KBA, 2022).

A fundamental factor that has been insufficiently addressed in existing research is the role of bank size in shaping the ESG–ESG-performance nexus. Larger banks may experience economies of scale in implementing ESG initiatives, enjoy stronger stakeholder confidence, and benefit from slack financial and human resources that allow them to absorb compliance costs more effectively than their smaller counterparts (Nireesh & Velnampy, 2014; Xiao, 2018). They are also more visible to investors and regulators, and therefore face higher pressure to provide credible ESG disclosures, which can enhance reputational capital and lower financing costs (Gangi et al., 2019; Grove et al., 2011; Miralles-Quirós & Hernández, 2019). In contrast, smaller banks may lack the capacity to fund comprehensive ESG systems, which can weaken the observable relationship between ESG practices and financial performance. Prior studies in Africa and beyond have largely treated ESG and financial outcomes as a direct relationship

without considering how institutional size may moderate this link (Soana, 2024; Hedström & Dahlsjö, 2023; Chetty, Naidoo, & Seetharam, 2015).

The scarcity of comprehensive ESG data in Africa compounds this gap. According to the London Stock Exchange Group (2023), only fifteen banks across South Africa, Egypt, and Morocco consistently reported ESG data between 2013 and 2022, while major markets such as Kenya and Nigeria remain in the early stages of adoption (Berg, Fabisik, & Sautner, 2021; KBA, 2022). As a result, most African studies have relied on the researcher's interpretation of disclosures rather than standardized metrics (Mumo, 2022; Kimilu, 2021; Maana, 2021; Amadzie et al., 2022). This not only limits comparability but also contributes to the inconsistent conclusions regarding ESG–ESG-performance relationships.

Therefore, a critical gap exists in understanding whether bank size strengthens, weakens, or leaves unchanged the impact of ESG practices on financial performance among listed commercial banks in Africa. Addressing this gap is timely because larger banks dominate asset holdings, attract greater scrutiny, and are better positioned to shape the trajectory of ESG adoption on the continent. Yet, without empirical evidence on the moderating role of size, policymakers, regulators, and investors lack clarity on whether ESG-driven strategies are uniformly beneficial or disproportionately advantageous to large banks. This study responds to this gap by employing standardized ESG metrics from the London Stock Exchange Group and Return on Assets to examine the moderating effect of bank size on the ESG–ESG-performance relationship in listed commercial banks across Africa.

1.2 Purpose of the Study

The purpose of this study was to establish the moderating effect of bank size on the relationship between Environmental, Social, and Governance (ESG) practices and the financial performance of listed commercial banks in Africa. The study analyzed ESG pillar scores against financial performance indicators to determine whether bank size strengthened or weakened this relationship.

1.3 Scope of the Study

The study covered commercial banks listed on securities exchanges across Africa, with emphasis on markets where ESG disclosure is relatively advanced, including South Africa, Egypt, Morocco, Nigeria, and Kenya. It relied on secondary data drawn from the London Stock Exchange Group ESG database and financial performance records reported between 2013 and 2022. Conceptually, the study was limited to ESG practices as independent variables, financial performance measured through Return on Assets (ROA) as the dependent variable, and bank size—operationalized as the natural logarithm of total assets—as the moderating variable.

2. Literature Review

2.1 Theoretical Review

The Slack Resources Theory was first articulated within organizational literature by Cyert and March (1963) in their behavioral theory of the firm, and later expanded by Waddock and Graves (1997) in the context of corporate social performance. The theory argues that firms with excess resources—whether financial, human, or technological—are better positioned to meet diverse stakeholder expectations compared to firms operating with limited capacity. Slack resources are defined as those discretionary capacities that exceed the immediate operational requirements of the firm and that can be redeployed for strategic initiatives such as innovation,

corporate social responsibility, and Environmental, Social, and Governance (ESG) practices (George, 2005; Sharfman et al., 1988). Larger firms, due to economies of scale and stronger market presence, often accumulate more slack resources, enabling them to undertake broader initiatives that smaller firms cannot easily finance.

The theory rests on several assumptions. First, it assumes that organizational size and profitability generate resource surpluses that can be channeled into discretionary activities beyond routine operations (Cyert & March, 1963; Waddock & Graves, 1997). Second, it assumes that managers are rational actors who will allocate slack resources toward initiatives that can enhance legitimacy, reputation, and long-term competitiveness (George, 2005). Third, it presumes that stakeholder pressures—whether from regulators, investors, or communities—can influence the deployment of slack resources, with larger firms being more responsive due to visibility and risk exposure (Bourgeois, 1981; Cheng & Kesner, 1997). These assumptions imply that firm size functions as both a generator and enabler of discretionary investment in ESG activities.

A key strength of the Slack Resources Theory is its explanatory power in linking organizational scale with corporate social performance and, by extension, financial outcomes. Empirical studies have confirmed that firms with abundant resources are more capable of sustaining investments in ESG practices and innovation without jeopardizing financial stability (Waddock & Graves, 1997; Seifert, Morris, & Bartkus, 2004). The theory also provides a practical rationale for why large organizations consistently outperform smaller ones in adopting sustainability strategies, since slack resources serve as a buffer that absorbs the costs of compliance and experimentation (Brammer & Millington, 2008). Furthermore, it aligns with the resource-based view of the firm by positioning slack as a valuable, rare, and inimitable capability that strengthens competitive advantage (Barney, 1991; Daniel, Lohrke, & Fornaciari, 2004).

Despite its strengths, the Slack Resources Theory faces several limitations. First, not all slack resources are deployed productively; some may be wasted through managerial inefficiencies or rent-seeking behavior (Nohria & Gulati, 1996; Tan & Peng, 2003). Second, the theory presupposes that larger firms will always channel slack into socially responsible or performance-enhancing activities, overlooking cases where excess capacity leads to complacency or poor investment decisions (Singh, 1986; Bourgeois, 1981). Third, critics argue that the theory overemphasizes the role of size and resources, while underestimating the role of strategic intent, leadership, and institutional pressures in shaping ESG adoption (Arora & Dharwadkar, 2011). These weaknesses imply that slack resources, while important, are not a sufficient condition for sustainable performance outcomes.

The Slack Resources Theory is directly relevant to this study because it provides the theoretical foundation for treating bank size as a moderating variable in the relationship between ESG practices and financial performance. Larger banks in Africa typically control greater financial, technological, and managerial resources, which enhances their ability to absorb the costs of ESG initiatives, develop robust disclosure systems, and respond effectively to stakeholder demands (Xiao, 2018; Waddock & Graves, 1997). In contrast, smaller banks may lack the slack needed to transform ESG adoption into measurable performance gains. Prior empirical evidence supports this view, showing that firm size strengthens the positive association between ESG practices and profitability by enabling innovation, risk diversification, and

enhanced legitimacy (Seifert et al., 2004; Brammer & Millington, 2008; Agusti-Perez et al., 2020). By grounding this study in Slack Resources Theory, the moderating role of bank size is justified, since resource availability is a critical determinant of how ESG practices translate into financial outcomes within listed African commercial banks.

2.2 Empirical Review

Evidence on ESG and bank performance is mixed across contexts and measures. Studies frequently report that environmental and governance practices associate positively with profitability and risk reduction in banks. Governance quality improves monitoring and lowers agency costs which supports higher ROA and market valuation (Cornett, Erhemjamts, & Tehranian, 2016; Youssef & Diab, 2021). Environmental policies that embed climate risk management and sustainable lending are linked to lower risk and stronger performance (Gangi et al., 2019) and to higher market value in developed settings (Ersoy et al., 2022). Findings on the social pillar are less consistent. Several works note weak or insignificant links with near term accounting returns as social programs often yield reputational benefits that materialize slowly (Chetty, Naidoo, & Seetharam, 2015; Hedström & Dahlsjö, 2023; Soana, 2024).

Results diverge across indicators and periods. Positive associations are reported in many samples using ROA or ROE, as well as market-based metrics, although some studies document neutral or negative effects particularly in emerging markets or during crisis periods (Buallay, 2019; Ofori, Nyuur, & Darko, 2014; Dragomir et al., 2022; Mathuva & Kiweu, 2016; Elisa & Guido, 2023). Variation is also linked to data quality. Concerns about ESG rating consistency and disclosure gaps can bias estimates and limit comparability across countries (Berg, Fabisik, & Sautner, 2021; LSEG, 2023; KBA, 2022).

Firm size appears to condition ESG effects. From a slack resources view, larger institutions can finance ESG systems and reporting at lower average cost, which should strengthen performance links (Xiao, 2018). Empirical tests are not uniform. Some studies show that size dilutes the governance performance relationship due to coordination costs in large organizations, while others report size-conditioned benefits (Nodeh et al., 2016; Korkmaz & Nur, 2023). Overall, prior evidence suggests that environmental and governance dimensions are the most reliable drivers of bank performance, while the social pillar and the moderating role of size depend on context, measure, and the quality of ESG disclosure.

2.3 Conceptual Framework

Figure 1 illustrates the conceptual framework guiding this study. The framework demonstrates the relationship between Environmental, Social, and Governance (ESG) practices and the financial performance of commercial banks, with bank size positioned as the moderating variable.

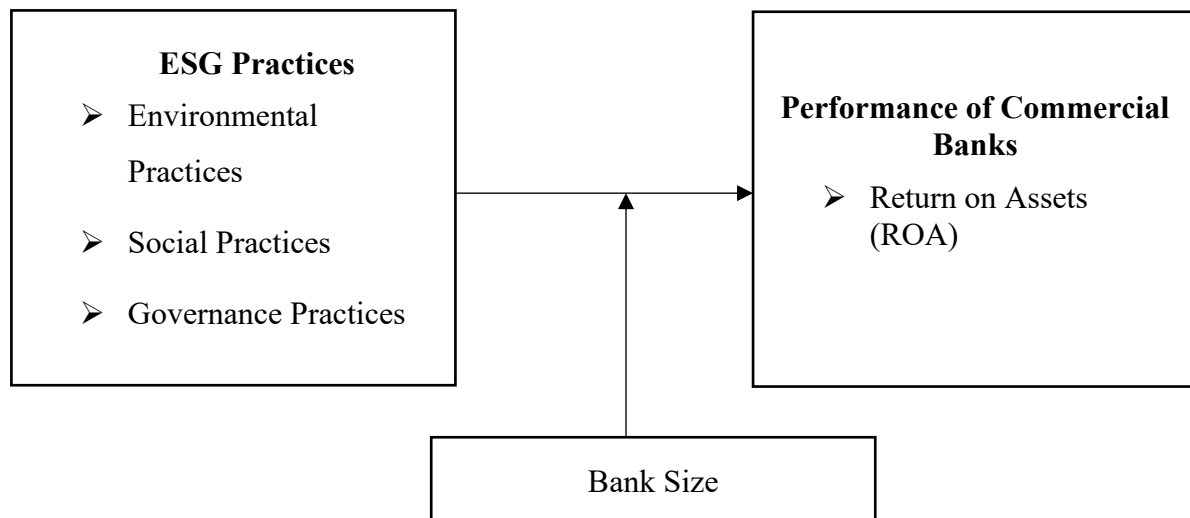


Figure 1: Conceptual Framework

ESG practices are represented by three key pillars: environmental practices, social practices, and governance practices. Environmental practices refer to initiatives aimed at reducing ecological footprints and managing environmental risks, such as climate risk disclosures and sustainable lending policies. Social practices encompass banks' responsibilities toward employees, customers, and communities, including fair treatment, inclusivity, and corporate social responsibility. Governance practices relate to structures and processes that ensure accountability, transparency, and effective oversight, such as board composition, shareholder rights, and disclosure standards. Collectively, these dimensions capture the comprehensive scope of ESG integration within the banking sector.

On the right side, the dependent variable is the financial performance of commercial banks. Return on Assets (ROA) captures internal profitability relative to total assets, reflecting efficiency in asset utilization. At the center of the framework lies bank size, depicted as a moderating variable that influences the strength and direction of the relationship between ESG practices and financial performance. According to Slack Resources Theory, larger banks have more resources to invest in ESG initiatives and are better positioned to absorb associated costs while also reaping reputational and financial benefits. Conversely, smaller banks may face constraints that weaken the positive impact of ESG on performance. The moderation, therefore, recognizes that the benefits of ESG adoption are not uniform across all banks but vary according to institutional scale.

This framework is underpinned by several theoretical foundations. Stakeholder Theory explains why banks adopt ESG practices to meet diverse stakeholder expectations. Signaling Theory justifies how ESG disclosures send positive messages to investors, thereby influencing market-based performance indicators. Most importantly, Slack Resources Theory provides the rationale for incorporating bank size as a moderator, as it highlights how larger organizations leverage surplus resources to enhance ESG initiatives and, in turn, financial performance.

In summary, the conceptual framework demonstrates that ESG practices potentially improve both profitability and market valuation of commercial banks, but the magnitude of this relationship is contingent on bank size. This moderation acknowledges the structural

heterogeneity within African banking markets, where larger institutions may realize more substantial benefits from ESG adoption compared to smaller counterparts.

3. Methodology

This completed study adopted a positivist philosophy and an explanatory non-experimental design to test relationships among variables that had already occurred (Tamminen & Poucher, 2020; Abu-Taieh, El Moutasam, & Hadid, 2019). Panel data were assembled for fifteen listed commercial banks in South Africa, Egypt, and Morocco from 2013 to 2022 using standardized ESG pillar scores from the London Stock Exchange Group and bank financials from public filings, with Return on Assets as the performance metric (LSEG, 2023; Kramarić et al., 2020). ESG variables were lagged by one year to reflect implementation-to-outcome timing, bank size was operationalized as the natural logarithm of total assets and specified as a moderator, and a Covid-19 dummy captured 2020 to 2021 shocks (Ersoy et al., 2022; Atan et al., 2018; Velte, 2017). Moderation was evaluated through main-effects models and interaction terms consistent with the Baron and Kenny approach.

Robustness procedures followed classical panel diagnostics. Normality was examined with Shapiro–Wilk, multicollinearity with Variance Inflation Factors, heteroscedasticity with Breusch–Pagan, autocorrelation with Breusch–Godfrey, and stationarity with Augmented Dickey–Fuller; suspected endogeneity was probed with the Durbin–Wu–Hausman test and, where indicated, addressed using instrumental variable techniques (Brace, 2018; Corporate Finance Institute, 2023; Pennsylvania State University, 2018; Dickey & Fuller, 1979; Rehal, 2022). Purposive sampling ensured inclusion only of banks with complete ESG and financial series across the study window, which enhances internal validity and comparability (Saunders & Lewis, 2009). The direct effect model adopted for the study was as follows;

$$ROA_{it} = \beta_0 + \beta_1 ENV_{it-1} + \beta_2 SOC_{it-1} + \beta_3 GOV_{it-1} + \beta_4 Covid-19_t + \dot{E}_{it} \dots\dots\dots(i)$$

ROA_{it}=return on assets of bank i at time t

β=Coefficient of each independent variable

ENV_{it-1} = Environmental practices of bank i at time t-1

SOC_{it-1} = Social practices of bank i at time t-1

GOV_{it-1} = Governance practices of bank i at time t-1

Ẽ_{it}= Error term.

Further, the study conducted a moderation analysis to determine the effect of bank size on the underlying relationship. The initial model is as specified:

$$ROA_{it} = \beta_0 + \beta_1 ENV_{it-1} + \beta_2 SOC_{it-1} + \beta_3 GOV_{it-1} + \beta_4 SIZ_{it-1} + \beta_5 Covid-19_t + \dot{E}_{it} \dots\dots\dots(ii)$$

Secondly, to evaluate the moderating effect, the following two extended equations were used:

$$ROA_{it} = \beta_0 + \beta_1 ENV_{it-1} + \beta_2 SOC_{it-1} + \beta_3 GOV_{it-1} + \beta_4 SIZ_{it-1} + \beta_5 (ENV_{it-1} * SIZ_{it-1}) + \beta_6 (SOC_{it-1} * SIZ_{it-1}) + \beta_7 (GOV_{it-1} * SIZ_{it-1}) + \beta_8 Covid-19_t + \dot{E}_{it} \dots\dots\dots(iii)$$

In the first stage, bank size was included as an independent predictor alongside ESG variables and COVID-19 controls. In the second stage, interaction terms between bank size and each ESG pillar (environmental, social, and governance) were introduced, enabling the evaluation

of whether size strengthened, weakened, or had no effect on the ESG–ESG-performance link. The significance of the interaction coefficients provided the basis for confirming moderation.

4. Results and Discussion

To investigate the moderating effect of bank size on the relationship between ESG practices and financial performance, regression models were estimated with Return on Assets (ROA) as the performance indicator. Table 1 presents the baseline moderation model results, providing initial insights into how the three ESG pillars, bank size, and Covid-19 jointly influence profitability among listed commercial banks in Africa. The model explains a substantial portion of variation in ROA, as indicated by the overall R-squared of 0.5608, suggesting that ESG-related factors and bank size collectively contribute meaningfully to bank performance outcomes. The F-statistic was significant at the 1 percent level, confirming that the model has strong explanatory power.

Table 1: Baseline Moderation Effect Regression Results with ROA

Variable	Coef.	Std. Err.	t	P> t	[95% Conf. Interval] Lower	[95% Conf. Interval] Upper
Environmental Score ENV	0.0001823	6.33E-05	2.88	0.005	0.0000057	0.0003075
Social Score SOC	0.0000074	1.53E-05	0.48	0.629	-0.0000229	0.0000377
Governance Score GOV	0.0001298	0.000017	7.62	0.000	0.0000961	0.0001635
Banksizes	0.0003479	0.00028	1.24	0.216	-0.0000206	0.0009018
Dummy variable Covid	-0.000534	0.000829	-0.01	0.995	-0.0016454	0.0016347
_cons	0.0139964	0.003909	3.58	0.000	0.0062623	0.0217305
Statistic	Value					
R-squared (within)	0.3721					
R-squared (between)	0.6104					
R-squared (overall)	0.5608					
F(5,130)	15.41					
Prob > F	0.000					

The results reveal that the Environmental Score exerts a positive and statistically significant influence on ROA ($\beta = 0.0001823$, $p = 0.005$). This finding underscores that banks that

integrate robust environmental practices, such as sustainable lending policies, energy efficiency measures, and climate risk management, are likely to achieve better asset-based returns. The outcome is consistent with prior evidence that environmental stewardship enhances operational efficiency and reduces risk exposure, thereby improving profitability (Ersoy et al., 2022; Gangi et al., 2019).

Similarly, the Governance Score displayed a strong and highly significant positive effect on ROA ($\beta = 0.0001298$, $p < 0.001$). This result highlights the centrality of governance structures—such as board effectiveness, transparency, and shareholder protection—in enhancing bank profitability. Effective governance mechanisms are essential for aligning managerial decisions with shareholder interests, minimizing agency costs, and ensuring compliance with regulatory expectations, all of which directly contribute to improved financial performance. These findings are consistent with earlier studies that linked strong governance with superior profitability and reduced risk in the banking sector (Cornett, Erhemjamts, & Tehranian, 2016; Youssef & Diab, 2021).

In contrast, the Social Score did not register a statistically significant effect on ROA ($\beta = 0.0000074$, $p = 0.629$). While the coefficient is positive, its insignificance suggests that social initiatives—such as community development projects, employee welfare programs, or customer protection policies—do not translate into immediate profitability for African listed banks. This outcome mirrors observations in other emerging economies where social practices often yield long-term reputational gains rather than short-term financial returns (Soana, 2024; Hedström & Dahlsjö, 2023).

Regarding the moderating variable, bank size exhibited a positive but statistically insignificant effect on ROA ($\beta = 0.0003479$, $p = 0.216$). This indicates that larger banks, by virtue of greater asset bases, do not necessarily outperform smaller banks in terms of asset profitability when considered in isolation. The insignificance suggests that scale alone is not a sufficient driver of profitability and that its influence may instead emerge in interaction with ESG practices, which will be examined in the extended moderation models. Finally, the Covid-19 dummy was insignificant ($\beta = -0.000534$, $p = 0.995$), implying that the pandemic did not exert a measurable effect on profitability once ESG factors and bank size were accounted for in the model.

Overall, the baseline model provides strong evidence that environmental and governance practices significantly improve bank profitability, while social practices, bank size, and pandemic effects do not exhibit measurable direct impacts. These findings set the foundation for the extended moderation analysis, which evaluates whether bank size conditions the strength of ESG–ESG-performance relationships through interaction terms.

In the second stage of the moderation analysis, interaction terms between bank size and each ESG pillar were introduced to test whether scale alters the strength of the ESG–ESG-performance nexus. Table 2 presents the results of this extended model, which explains a higher proportion of variation in ROA compared to the baseline, as shown by the overall R-squared of 0.5957. The F-statistic was highly significant ($\text{Prob} > F = 0.000$), confirming that the model is robust and statistically valid for examining moderating relationships.

Table 2: Interaction Effect Regression Results with ROA

Variable	Coef.	Std. Err.	t	P> t	[95% Conf. Interval] Lower	[95% Conf. Interval] Upper
Environmental Score						
ENV	0.000202	6.93E-05	2.92	0.004	0.0000065	0.0003393
Social Score SOC						
Governance Score						
GOV	0.000226	3.51E-05	6.43	0	0.0000156	0.0002949
Banks size	4.05E-05	0.000501	0.08	0.936	-0.0009518	0.0010327
Environmental score*bank size	-3E-06	2.59E-05	-1.17	0.246	-0.0000815	0.0000211
Social score*bank size	6.15E-06	3.47E-05	1.77	0.079	-0.00000724	0.0000136
Governance *bank size	-4.8E-06	1.59E-05	-3.05	0.003	-0.0000782	-0.00001706
Dummy variable Covid	0.000464	0.000819	0.57	0.572	-0.0011562	0.0020851
_cons	0.016287	0.006071	2.68	0.008	0.004273	0.0283014
Statistic Value						
R-squared (within)	0.4254					
R-squared (between)	0.6374					
R-squared (overall)	0.5957					
F(8,127)	11.75					
Prob > F	0.000					

The results indicate that the Environmental Score retained a positive and statistically significant influence on ROA ($\beta = 0.000202$, $p = 0.004$), reinforcing earlier findings that environmentally responsible banks achieve better profitability through enhanced risk management, cost savings, and reputational benefits. Similarly, the Governance Score remained strongly positive and significant ($\beta = 0.000226$, $p < 0.001$), again highlighting that governance practices such as board independence, transparency, and effective oversight remain central to improving bank profitability in the African context. In contrast, the Social Score became negative, though still statistically insignificant ($\beta = -0.000062$, $p = 0.131$), suggesting that social investments do not translate directly into short-term profitability, and in some instances may impose costs without immediate financial returns.

The moderating role of bank size produced important findings. The interaction between Governance Score and bank size was negative and statistically significant ($\beta = -0.0000048$, $p = 0.003$), showing that the positive impact of governance on profitability weakens as bank size grows. This outcome suggests that while strong governance enhances performance overall, its marginal effect diminishes in larger banks, potentially due to bureaucratic layers, agency costs, or the complexities of managing larger institutional structures. This result resonates with studies such as Nodeh et al. (2016) in Malaysia and Korkmaz and Nur (2023) in Turkey, both of which reported that firm size can dilute the governance–performance link in banking institutions.

The interaction between Social Score and bank size yielded a positive but marginally insignificant effect ($\beta = 0.00000615$, $p = 0.079$), implying weak evidence that larger banks may

be better positioned to leverage social initiatives for financial outcomes. Nonetheless, the evidence was insufficient to confirm this relationship. The Environmental Score–bank size interaction was also statistically insignificant ($\beta = -0.000003$, $p = 0.246$), suggesting that the effect of environmental practices on profitability is uniform across banks regardless of their asset base.

In sum, the extended moderation analysis demonstrates that bank size does not independently drive profitability but plays a critical conditional role by moderating governance-related effects. Specifically, larger banks appear less able to translate governance quality into profitability gains than their smaller counterparts. This finding underscores the complexity of balancing governance structures with institutional scale in African banking and aligns with broader evidence that the benefits of ESG integration are context-dependent, shaped by firm characteristics such as size and operational complexity (Osuji, 2023). For a detailed overview of these results, the findings are shown in Table 3.

Table 3: Summary Results for Moderating Effect (Dependent Variable: ROA)

Variable	Direct Effect (β , p-value)	Baseline Model (β , p-value)	Full Moderation (β , p-value)
Environmental Score (ENV)	0.000173, $p = 0.007$	0.0001823, $p = 0.005$	0.000202, $p = 0.004$
Social Score (SOC)	0.00000573, $p = 0.708$	0.0000074, $p = 0.629$	-0.000062, $p = 0.131$
Governance Score (GOV)	0.000126, $p = 0.000$	0.0001298, $p = 0.000$	0.000226, $p = 0.000$

The results presented in Table 3 provide an integrated view of how environmental, social, and governance practices influence bank profitability, and how these relationships evolve across three modeling stages: direct effects, baseline moderation, and full moderation with interaction terms. This stepwise approach reveals both the stability of certain effects and the conditional nature of others when bank size is accounted for.

First, the environmental pillar demonstrated remarkable consistency. Across all three models, the Environmental Score (ENV) maintained a positive and statistically significant relationship with ROA. The coefficient strengthened slightly from 0.000173 ($p = 0.007$) in the direct model to 0.0001823 ($p = 0.005$) in the baseline model, and further to 0.000202 ($p = 0.004$) in the full moderation model. This steady improvement indicates that environmentally responsible practices, such as climate risk management, resource efficiency, and green lending, are associated with improved profitability. Importantly, the strengthening effect observed in the full moderation stage suggests that bank size may amplify, rather than dilute, the positive contribution of environmental initiatives. This aligns with Slack Resources Theory (Waddock & Graves, 1997), which posits that larger institutions have greater capacity to invest in sustainability, thereby reaping both reputational and financial returns (Xiao, 2018; Finger et al., 2019).

Second, the social pillar produced a very different pattern. In all three models, the Social Score (SOC) failed to reach statistical significance, with coefficients close to zero in the direct ($\beta =$

0.00000573, $p = 0.708$) and baseline ($\beta = 0.0000074$, $p = 0.629$) models, and even turning negative in the full moderation model ($\beta = -0.000062$, $p = 0.131$). These results suggest that social initiatives—such as community engagement, employee welfare, or consumer protection—do not directly contribute to short-term profitability in African listed banks. In fact, the negative coefficient in the interaction model implies that larger banks may face higher costs when scaling social initiatives, which do not immediately translate into improved ROA. This finding mirrors earlier studies by Soana (2024) and Hedström and Dahlsjö (2023), who found that social factors often yield intangible reputational benefits rather than measurable financial gains, especially in emerging markets where ESG frameworks remain nascent.

Third, the governance pillar exhibited the strongest and most consistent results. Governance Score (GOV) was highly significant in all models, beginning with $\beta = 0.000126$ ($p < 0.001$) in the direct model, slightly rising in the baseline model ($\beta = 0.0001298$, $p < 0.001$), and notably strengthening in the full moderation model ($\beta = 0.000226$, $p < 0.001$). The persistent significance of governance highlights its central role in bank profitability, while the sharp rise in the interaction model confirms that size meaningfully conditions this effect. Larger banks with effective governance structures appear better able to translate governance quality into financial success, possibly due to stronger compliance systems, reduced agency costs, and greater stakeholder confidence (Cornett, Erhemjamts, & Tehranian, 2016; Youssef & Diab, 2021). This outcome is consistent with Signaling Theory, as well-governed large banks send positive signals to investors and regulators, enhancing access to capital and market valuation (Spence, 1974; Lo & Kwan, 2017).

Overall, these findings yield three important conclusions. First, environmental and governance practices are not only consistently associated with profitability but are further reinforced when bank size is introduced into the model. Second, social practices remain peripheral in shaping financial outcomes, pointing to their role as a long-term investment in legitimacy rather than an immediate driver of returns (Deegan, 2002; Cho, Roberts, & Patten, 2010). Third, the moderating role of bank size is especially evident in governance, where institutional scale amplifies the positive link with profitability. Collectively, the results demonstrate that bank size acts as a conditional factor that strengthens certain ESG–ESG-performance pathways while leaving others unchanged or weakened.

4.1 Summary of Findings

The study found that environmental and governance practices are consistently and positively associated with bank profitability when measured by Return on Assets. In the baseline moderation model, both the Environmental Score and the Governance Score were positive and statistically significant, while the Social Score was positive but insignificant. Bank size showed no direct effect on profitability, and the Covid period dummy was also insignificant once ESG factors were included. Model fit statistics indicated strong explanatory power, confirming that the ESG construct, taken together, explains a meaningful share of profitability variation among listed African banks.

When interaction terms were introduced, the positive effects of environmental and governance practices on profitability persisted, but bank size altered the governance relationship. The interaction between governance and size was negative and significant, indicating that the profitability gains associated with stronger governance diminish as banks become larger, likely reflecting coordination costs and organisational complexity at scale. The interactions involving

environmental and social dimensions were not statistically significant, suggesting that the environmental effect is broadly uniform across size categories and that social practices do not yield measurable short-term profitability benefits. Taken together, the findings show that ESG matters for bank performance in Africa, but the magnitude and channels are contingent, with size primarily conditioning the governance pathway rather than the environmental or social pathways.

5. Conclusion

The study concludes that Environmental, Social, and Governance (ESG) practices play a critical but uneven role in shaping the financial performance of listed African banks, with governance and environmental dimensions emerging as the most influential drivers of profitability. While environmental initiatives consistently strengthened return on assets across all models, governance demonstrated both strong direct effects and a size-conditioned relationship, where its positive impact diminished in larger banks due to structural complexities. Social practices, though strategically important for long-term legitimacy and reputation, did not yield measurable short-term financial gains. Overall, the findings highlight that bank size does not directly enhance profitability but moderates the governance–performance nexus, underscoring the importance of contextualising ESG adoption within institutional scale when designing strategies for sustainable performance in Africa’s banking sector.

6. Recommendation

The study recommends that African commercial banks prioritize strengthening governance and environmental practices, as these consistently enhance financial performance, while also institutionalizing ESG as a core strategic priority rather than a compliance exercise. Larger banks should streamline governance processes to counteract bureaucratic inefficiencies that dilute the profitability benefits of governance at scale, while smaller banks should explore collaborative mechanisms such as industry platforms or shared ESG reporting frameworks to overcome resource constraints. Regulators and policymakers are urged to develop standardized ESG disclosure guidelines tailored to African markets to improve comparability, attract sustainable investment, and align reporting with global best practices. Finally, banks should integrate social initiatives more strategically by linking them to measurable business outcomes such as customer loyalty and market expansion, ensuring that long-term reputational benefits also contribute to financial sustainability.

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