

EMPIRICAL ARTICLE

Corporate Social Responsibility (CSR) and Corporate Profitability in Africa: Non-Linearities, Synergies and Complementarities

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Abstract

Purpose. This study investigates the non-linear, synergistic, complementary, and long-term effects of corporate social responsibility (CSR) on corporate profitability, with a focus on stakeholder responsibility and profitability in Africa.

Design/methodology/approach. The study employs a dynamic Generalised Method of Moments (GMM) panel-data approach, analysing data from 369 listed firms in Africa from 2006 to 2020. It demonstrates the synergistic and complementary effects of social and governance factors on shareholder profitability, as well as the impacts of social and environmental factors on stakeholder profitability. The study emphasises the long-term inverted U-shaped effect of social and governance-oriented (CSR) on shareholder profitability and the persistent long-term synergistic relationship between social and governance CSR and environmental and social CSR on both shareholder and stakeholder profitability.

Findings. The main findings show an inverted non-linear threshold effect of social and governance CSR on shareholder profitability, but not on stakeholder profitability, implying that social and governance CSR might harm corporate shareholders beyond a certain level.

Practical implications. Managers should exercise caution when selecting, combining, and coordinating CSR activities, as undertaking multiple initiatives simultaneously can create synergies that improve both stakeholder and shareholder profitability. Lastly, the evidence on the long-term effects of CSR further encourages managers to invest in and participate in CSR initiatives, particularly when these efforts produce positive, enduring synergistic benefits for shareholder and stakeholder profitability.

Originality/value. Previous researchers have examined various factors influencing CSR and corporate profitability in Africa, but this study specifically concentrates on the synergistic advantage for shareholder and stakeholder profitability.

KEYWORDS

Stakeholder; Shareholder; Profitability; Corporate; Social Responsibility.

1 | INTRODUCTION

Corporate profitability remains a fundamental pillar of firm sustainability, underpinning the "going concern" assumption that firms will

continue to operate in the foreseeable future (Desai et al. 2020, Rodríguez et al. 2024, Ramezani et al. 2002). Profitable firms are more likely to attract external capital, reinvest earnings internally, and instill confidence in both current and prospective investors (Baker and Martin 2011, Strebulaev 2007). Given this critical role, corporate profitability has long attracted scholarly attention in accounting and finance literature. In parallel, corporate social responsibility (CSR) has gained traction as a strategic tool for enhancing stakeholder trust and reputational capital. CSR initiatives, spanning environmental, social, and governance (ESG) dimensions, enable firms to address societal expectations while building

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legitimacy with stakeholders such as communities, customers, regulators, and employees (Freeman and Velamuri 2006, Trapp 2014, Steurer 2010). Prior research suggests that CSR may improve firm image and reduce regulatory pressure (Haji et al. 2022), while enhancing financial performance through increased consumer loyalty and investor appeal (Du et al. 2010).

Yet, despite the widely documented potential of CSR, its relationship with profitability remains empirically contested and theoretically fragmented, particularly in emerging and African markets. Existing studies report mixed results—positive, negative, or null effects—depending on the context, the CSR dimension examined, and the financial metric used (Zheng et al. 2022, Nollet et al. 2016). For example, recent empirical work on Indian firms found that composite ESG scores had no significant impact on profitability, whereas social initiatives positively correlated with return on assets (ROA), whereas governance initiatives negatively affected ROA. Similarly, Chinese studies demonstrated that environmental performance significantly improved profitability through innovation and market acceptance, but governance strategies showed diminishing returns. This variation highlights a critical research gap: CSR is often treated as a homogeneous construct, even though firms frequently implement multiple, overlapping CSR initiatives, each with potentially nonlinear and interactive effects. Moreover, the empirical literature has largely focused on linear relationships between CSR and profitability, overlooking the possibility of threshold effects—where CSR benefits may taper off or even reverse beyond certain levels (Fombrun 2005). This omission is particularly problematic in Africa, where CSR practices are often shaped by heterogeneous institutional, cultural, and sectoral dynamics. The non-linearity hypothesis—that CSR may have diminished or even negative returns at higher levels remains underexplored in African corporate research and lacks robust empirical validation in this context. Compounding this gap is the scarcity of studies exploring synergies and complementarities across CSR domains. In practice, firms do not engage in CSR activities in isolation; they bundle environmental, social, and governance initiatives to pursue strategic and reputational objectives. However, whether such combinations yield complementary or synergistic effects on firm performance remains an open question (Gregory et al. 2014). For instance, Chinese environmental performance studies identified synergies between governance methods and market-driven environmental effectiveness, while Swedish research found that sustainability performance was positively correlated with financial outcomes, particularly among firms with educationally diverse boards. This oversight restricts our understanding of how CSR integration across domains can amplify or erode profitability, particularly when measured from both stakeholder and shareholder perspectives. A further limitation in existing research is the temporal scope. While many studies examine short-run effects, few investigate whether CSR benefits persist in the long run, especially in environments characterised by regulatory volatility and limited investor protections, such as in many African economies (Steurer 2010). Longitudinal evidence

on whether CSR creates enduring financial value, either through compounding stakeholder trust or sustainable operational efficiencies, is still lacking.

In response, this study addresses four interrelated and underexplored questions: whether CSR has non-linear effects on corporate profitability; whether synergistic or complementary interactions among CSR dimensions exist and how they affect financial outcomes; whether these effects differ for shareholder versus stakeholder profitability; and whether these patterns persist in both the short run and the long run.

To investigate these questions, we employ a dynamic panel GMM approach on a longitudinal dataset of 369 listed African firms from 2006 to 2020. Our findings reveal that the relationship between CSR and profitability is complex and non-linear. Specifically, we identify inverted U-shaped effects of social and governance CSR on shareholder profitability, as well as positive synergies between social and governance CSR (for shareholder profitability) and between social and environmental CSR (for stakeholder profitability). These effects persist in the long run, suggesting durable financial benefits from strategically coordinated CSR investments.

This study contributes to theory by demonstrating that CSR's profitability effects are contingent on both threshold levels and inter-CSR complementarities, advancing current understanding beyond linear or isolated CSR impacts. Practically, it offers guidance to managers on the importance of aligning and calibrating CSR efforts to optimise financial returns for both shareholders and stakeholders, particularly in emerging markets.

2 | LITERATURE REVIEW

2.1 | Corporate Social Responsibility

Corporate social responsibility is a concept rooted in business, political, sociological, and ethical perspectives (Crane et al. 2008, Garriga and Melé 2004, Klonoski 1991). Given the different perspectives on corporate social responsibility, theories such as economic responsibility theory, shareholder value theory, and stakeholder value theory explain CSR from a business perspective, while ethical responsibility theory, corporate citizenship theory, and corporate social performance theory explain CSR from ethical, political, and sociological perspectives, respectively. In this study, however, the economic responsibility theory, which encompasses shareholder and stakeholder value theories, is used to support the nexus between CSR and corporate performance.

According to the economic responsibility theory, the primary obligation of corporate entities is to create wealth or value (Crane et al. 2008, Garriga and Melé 2004, Klonoski 1991). Based on the idea that corporations are established to maximise wealth through viable economic ventures that generate economic value, this theory emphasises wealth maximisation. It indicates and implies that all corporate activities and strategies, including corporate social responsibility, should be aimed at increasing wealth.

Following the profit, value maximisation, and distribution frameworks (see Kochan and Rubinstein 2000), the shareholder and stakeholder value theories emphasise how profits and value are pursued and allocated. The shareholder value theory argues that the pursuit of profit maximisation must be carefully designed and directed towards the interests of shareholders, meaning that all corporate activities and strategies, including corporate social responsibility, must aim to protect and enhance shareholder interests. Conversely, stakeholder value theory suggests that, in the pursuit of profit maximisation, the interests of parties other than shareholders must also be considered and integrated into all corporate activities and strategies (Aguilera and Cuervo-Cazurra 2009). It asserts that pursuing stakeholder value offers some long-term benefits for firms and extends beyond merely maximising shareholder interests to include creditors, society, customers, suppliers, and debtors, whereas the shareholder value theory concentrates solely on safeguarding and maximising shareholder interests. Based on these theories, return on equity and return on assets are used as metrics for shareholder and stakeholder value, respectively (Kochan and Rubinstein 2000). In light of the reviewed theories, there are arguments to suggest that CSR can impact corporate performance.

Based on empirical studies, several investigations have examined the non-linear effect of corporate social responsibility on firms' performance. The literature generally indicates that if the costs of CSR surpass the benefits, it may decrease firm performance. This suggests that CSR can have both positive and negative effects on corporate performance, pointing to a potential non-linear relationship between CSR and firm performance. For example, in the United States, Rouine et al. (2022) investigated how corporate social responsibility influences firms' total risk among S&P 500 listed companies between 2002 and 2017.

2.2 | Environment, Social and Governance (ESG)

The study employs panel smooth transition regression and shows that the relationship between corporate social responsibility performance is non-linear, implying that corporate social responsibility reduces firm risk beyond a certain threshold. Similarly, Alfalih (2023) examined both the linear and non-linear impacts of corporate social dimensions, such as environmental, social, and governance (ESG), and how their interactions influence economic growth in the short- and long-term, using S&P 500 non-financial companies and other manufacturing and service firms based in the USA. The study employed a dynamic panel model using the System Generalised Method of Moments (SYS-GMM) technique. A total of 2,829 observations were made across 281 companies between 2010 and 2019. The results reveal that firms' financial performance was largely influenced by the social and governance dimensions of ESG. The findings suggest that both directly and indirectly, ESG disclosure practices significantly impact firms' financial performance.

Also, Chen et al. (2018) investigated the difference between corporate social responsibility and corporate performance. The study used

1461 non-financial service companies publicly traded in the US, observing 6715 firms annually. The study posits that the relationships between corporate social responsibility and corporate financial performance, as well as between corporate social irresponsibility and economic performance, are U-shaped. Moreover, Blasi et al. (2018) investigated the effect on corporate social responsibility activities and economic performance, considering seven macro-categories of corporate social responsibility and six market-based and accounting-based performance indicators, by disaggregating firms by sector of activity.

Furthermore, Nguyen and Nguyen (2015) examined the impact of corporate social responsibility on the risk of US-based firms as measured by KLD. Using the panel analysis technique to highlight the corporate social responsibility dimensions that contribute most to a firm's credit risk and to reveal potential non-linear relationships between corporate social responsibility and firm risk. The results show an increased risk for shareholders in the areas of diversity, employee relations, and corporate governance. Additionally, the findings portray that corporate social responsibility, as it relates to diversity and employee relations, is associated with increased risk. This implies that aggregate social responsibility indicators positively influence firm risk and ought to be strengthened to minimise it.

In the context of Europe, Lahouel et al. (2022) studied the non-linear effect of environmental corporate social responsibility on firm financial performance to enhance our understanding of when it becomes beneficial to go green using panel smooth transition regression. The data covers the period between 2005 and 2017 and includes economies such as Italy, Germany, France, and Spain.

The results illustrate that various nexus patterns, ranging from non-linear negative to non-linear positive to inverted U-shaped, exist between environmental corporate social responsibility and firm performance. Similarly, Lajnef and Ellouz (2022) examined the link between corporate social responsibility and company performance among French non-financial firms between 2004 and 2020. Employing a non-linear auto-regressive NARX model, the results suggest that (i) a bi-directional nexus exists between corporate social responsibility and company performance, and (ii) French firms rely heavily on social and environmental corporate social responsibility to improve their performance.

Moreover, Lahouel et al. (2020) sought to answer the long-standing question of when it pays for firms to go green by employing a panel smooth transition regression model to examine the relationship between environmental and financial performance. The study employed data from 61 French companies from 2005 to 2017. The findings showed inverted-U and inverted-V relationships when using Tobin's Q and return on assets, respectively. This implies that beyond a certain level of environmentally related corporate social responsibility, it may impede firm financial performance. Nirino et al. (2020) explored the impact of corporate social responsibility on the financial performance of firms in the food and beverage sector. The study used ordinary least squares regression on data from 190 food and beverage companies and found that governance and social outcomes are positively influenced by corporate social responsibility governance. This shows that

stakeholders in the food and beverage industry genuinely care about environmental and societal results, which in turn creates economic value by improving financial performance.

Again, Gangi et al. (2018) examined whether and how knowledge of corporate social responsibility influences financial performance in the European banking sector. The study used fixed-effects regression analysis along with the two-stage Heckman model (Heckman 1976) to address potential endogeneity bias, analysing data from 72 banks across European countries from 2009 to 2015.

Findings from the study indicate that awareness of corporate social responsibility influences citizens' behaviour, which in turn affects the financial performance of European banks. Furthermore, in terms of the reputational effects of corporate social responsibility, citizens' performance serves as a positive indicator of a bank's financial success. The study's findings suggest that knowledge of corporate social responsibility is crucial for the effective implementation of CSR programmes for external stakeholders and enhances a bank's competitive edge.

Furthermore, Nollet et al. (2016) investigated the link between corporate social performance and financial performance, employing both accounting and market-based financial indicators. Using fixed-effects panel models of S&P 500 firms between 2007 and 2011, the results demonstrate that corporate social performance has a non-linear inverted U-shape effect on return on capital, suggesting that it positively influences financial performance in the long term. Their findings further reveal that the inverted U-shaped effect of corporate social performance on financial performance is significant only for governance-related corporate social performance.

Cavaco and Crifo (2014) explored the relationship between various dimensions of corporate social responsibility and financial performance. Using a final unbalanced panel sample of 300 firms with 1094 annual observations from 15 countries over the period 2002-2007, the results show that acting responsibly towards companies' stakeholders, such as employees, customers, and suppliers, is a complementary factor for financial performance. This indicates that conflicts are diminished while mutual benefits among stakeholders are significantly enhanced, leading to improved financial performance and providing the firm with a competitive advantage.

In the context of Asia, Zheng, Deng, Song, Ye, and Luo (2022) evaluated the non-linear relationships among corporate social responsibility, innovation, and construction firm performance, with the construction firm's competitive position as a moderating role. Using multiple regression analysis on 75 construction firms in China, with annual observations totalling 292, the study found that corporate social responsibility and innovation have a U-shaped impact on construction firms, using the price-to-book ratio as a measure of corporate financial performance.

This indicates that corporate social responsibility and innovation can only influence the financial performance of construction firms after reaching a certain threshold. Furthermore, Lee and Yang (2021) examined the impact of corporate social responsibility expenditure on firms' profitability in Taiwan. The study uses a panel smooth transition model

covering data from 2013 to 2017 and reports that corporate social responsibility expenditure has a non-linear effect on profitability. Similarly, Liu et al. (2021) explored the effects of corporate social responsibility and financial technology on bank performance using data from Chinese banks between 2009 and 2018.

Regression analyses reveal that, although corporate social performance indicators (governance, social, and environmental) do not significantly affect return on assets, return on equity, or nominal interest profit margin, there is evidence that governance and environmental aspects of corporate social responsibility produce complementary and synergistic effects on bank performance. This suggests that governance and environmental CSR are well-coordinated and organised to enhance bank performance. Additionally, corporate social responsibility exhibits an inverted-U-shaped effect on banks' return on assets, while financial technology has a positive and significant impact on return on equity and the nominal interest profit margin.

Also, Shabbir et al. (2020) evaluated the effect of corporate social responsibility on corporate performance of financial and non-financial firms in Pakistan. The study employs linear panel models for 350 firms over the period 2011-2017. The results indicate that, while corporate social responsibility has a linear negative effect on return on capital, a non-linear U-shaped nexus is observed from corporate social responsibility to accounting-based performance, implying that corporate social responsibility promotes firm performance in the long run. Specifically, environmental and governance-related corporate social responsibility strongly exhibits this non-linear relationship on firm performance.

Again, Tunio et al. (2021) examined how corporate social responsibility disclosures influence bank financial performance while investigating the mediating role of employee productivity. Using a panel data framework covering 30 Chinese commercial banks from 2008 to 2019, the results suggest that while governance CSR significantly impacts banking performance, employee productivity also enhances it, and there is a non-linear relationship between the combined ESG score and employee productivity, as well as between these factors and banks' financial performance.

Furthermore, Fabozzi et al. (2022) investigated how corporate sustainability, in the form of corporate social responsibility, affects corporate financial performance and credit ratings in Japan. Using panel regression analysis, the results show that corporate social responsibility has negative effects on accounting-based performance indicators but positive effects on stock market-based indicators. However, the quantile regression models exhibit non-linear patterns in CSR's relationship with performance and credit ratings.

In the context of cross-country studies, Farah et al. (2021) evaluate the nonlinear effect of corporate social responsibility on firm systematic risk, using operating leverage as a mediating/moderating variable through which corporate social responsibility affects firm risk. Employing a 2-stage least square panel model with firms from 43 countries between 2005 and 2017, their results suggest that an inverted U-shape nexus exists between corporate social responsibility and systematic risk of firms. This implies that, initially, risk increases with corporate

social responsibility and then declines after a certain threshold. Similarly, Lin, Law and Azman-Saini (2019) used an innovative threshold estimation technique to evaluate the impact of corporate social responsibility on corporate financial performance and to examine how that impact varies with market differentiation. The study employed a worldwide, automated dataset comprising 133 countries across 10 regions for the period 2011-2017. The findings show an inverted V-shaped relationship between corporate social responsibility and corporate financial performance. This indicates that beyond a certain threshold, increasing corporate social responsibility has a diminishing effect on corporate financial performance.

2.3 | Hypotheses Development

From the theoretical and empirical review, there is substantial evidence of a non-linear relationship between corporate social responsibility and corporate performance. Interestingly, however, empirical evidence demonstrating a non-linear relationship between these two variables is limited, if not entirely absent. Moreover, existing studies do not utilise all three indicators of corporate social responsibility, environmental, social, and governance (ESG), to examine which of them has a non-linear effect on corporate performance, particularly in the context of Africa.

Given the scarcity of empirical evidence on the non-linear effects of CSR on corporate performance despite numerous studies in other regions, there is an urgent need to collect such evidence within the African context. This would improve our understanding and guide corporate policy regarding the optimal levels or thresholds of CSR that significantly impact corporate performance. In light of this, this study hypothesises that:

H1: There is no non-linear relationship between corporate social responsibility indicators (ESG) and corporate performance in Africa.

Similarly, based on empirical studies of corporate social responsibility and corporate performance, there is no evidence of synergistic effects of CSR indicators on corporate performance, particularly in the African context. In other words, the empirical literature does not clarify whether implementing two CSR activities simultaneously produces positive effects on corporate performance. The lack of such evidence hinders our understanding of policies on how undertaking two CSR activities simultaneously influences corporate performance. Therefore, there is a pressing need for empirical data on how engaging in two CSR activities affects corporate performance to support this policy approach. Consequently, the study hypothesises that:

H2: There is no synergetic/complementary effect between CSR activities on corporate performance in Africa.

One key novelty of these two hypotheses lies in their ability to explore the non-linear and synergistic or complementary effects of CSR

on corporate performance by distinguishing corporate performance into shareholder and stakeholder profits, following previous studies (DesJardine et al. 2023, Glamboosky et al. 2023, Richards 2023). Therefore, previous research, drawing on shareholder and stakeholder theories, distinguishes between shareholder and stakeholder profits. This evidence is designed to support the justification for CSR spending, and therefore, this study hypothesises that:

H3: There is no long-run effect of CSR on shareholder and stakeholder profits.

3 | METHODOLOGY

The study uses secondary data from the Machame Ratios database, which covers 369 publicly listed firms across various sectors in Africa. The Machame Ratios is a digital library network providing over 15 years of daily and yearly research data on African securities exchanges, including stocks, bonds, ETFs, commodities, forex, and cryptocurrencies. The dataset spans from 2006 to 2020 and includes key firm performance and corporate social responsibility (CSR) variables relevant to the analysis. Before conducting regression analysis, the data underwent thorough cleaning to ensure accuracy and consistency. Missing values were imputed using appropriate methods, and duplicate observations and outliers were identified and either corrected or Winsorised as needed. The panel structure was checked to ensure proper alignment of firm-year observations, and necessary transformations, such as logarithmic conversions for skewed variables, were applied.

These pre-processing steps enhance the reliability of the empirical analysis and reduce potential estimation biases. According to Baltagi (2015), panel data is considered superior to traditional time-series and cross-sectional data because it increases the reliability and robustness of empirical results. Panel data allows control of omitted variable bias and facilitates the analysis of both long-term (temporal) and short-term (entity-specific) effects, thereby overcoming limitations associated with other data structures (Imbens and Wooldridge 2009). This methodological approach improves the validity of the study's findings by providing a more comprehensive view of governance-performance relationships across different sectors.

3.1 | Estimation Technique

In this study, the dynamic GMM panel data strategy ($Y_{it} = \alpha Y_{it-1} + \gamma_t + \beta X_{it} + \epsilon_{it}$, Eq. 1) is employed to explore the link between CSR and corporate performance. While the econometric literature projects that the panel strategy provides more convincing and reliable results compared to the traditional time series and cross-sectional strategies (Baltagi 2015) and has the ability to deal with omitted variable biases (Imbens and Wooldridge 2009), the dynamic GMM is employed for several reasons. First for the purpose of achieving the objective on estimating long-run effects of CSR on corporate performance, the dynamic GMM

offers that ability (Qudrat-Ullah and Nevo 2021) and expresses it as (Eq. 2). That is, the long-run estimation is obtained by dividing the significant coefficient of CSR () by one minus significant coefficient of the lag of the dependent variable $(1 - \phi)$. Similarly, following the econometric literature on dynamic GMM models, GMM is used to control for cross-sectional dependence and high persistence in the dependent variable, which are present in the dataset (Tchamyou et al. 2019). Also, for data structures in which the number of entities (firms) is greater than the number of time series (years), the GMM provides more convincing, robust and reliable results (Tchamyou 2020).

Again, to address potential endogeneity arising from reverse causality between CSR and corporate performance, the GMM offers an easier alternative to the instrumental variable model (Roodman 2009). To obtain the non-linear threshold point of CSR on corporate performance, the approach of partial derivatives is taken with respect to CSR and equated to zero and solved to obtain $-\beta_i / 2 * \beta_j$ (Eq 3) (Lind and Mehlum 2010). It is imperative to note that one key limitation of the GMM approach is that it can generate a large number of instruments, particularly in system GMM, which may overfit the model and weaken the validity of the moment conditions. In an effort to cure this limitation, an instrument reduction technique by way of collapsing instruments (Roodman 2009) and selecting a subset of instruments to maintain an optimal instrument count was employed.

In response to increasing academic and managerial interest in how various aspects of Corporate Social Responsibility (CSR) interact to influence firm profitability, this study adopts a structured approach to examine synergetic and complementary effects among Environmental (E), Social (S), and Governance (G) CSR indicators. The goal is to ascertain whether combinations of these CSR dimensions generate joint effects on profitability that are greater (synergies) or differ in direction (complementarities) from their individual effects.

The concept of synergy in CSR literature refers to a situation in which the combined deployment of two CSR initiatives produces an effect on firm performance that exceeds the sum of their individual effects (Saivinod and Sivakumar 2025). Conversely, complementarity suggests that the impact of one CSR dimension depends on the presence of another, with both dimensions working together to influence each other's effects (García-Piqueres and García-Ramos 2022).

To empirically examine these effects, this study employs an interaction term framework within a model formed by multiplying the standardised values of relevant CSR components (e.g., Social $\times$ Governance, Social $\times$ Environmental). These interaction terms are then added to the profitability regression models alongside their corresponding main effects. In this context, a significantly positive coefficient on the interaction term indicates a synergetic effect, meaning the combined implementation of both CSR activities boosts profitability more than their individual contributions. Conversely, a significantly negative coefficient may suggest that combined CSR efforts are counter-productive or yield diminishing returns. This method follows established practices in

strategic management and CSR research and aligns with recent methodological advancements in examining joint strategic effects (Canh et al. 2019).

To account for sector-specific effects, interaction terms were estimated separately for each sector, ensuring that the analysis reflects the contextual differences in CSR impact as emphasised by the contextual theory of difference (Stephens et al. 2019). Finally, robustness checks, including model re-estimation without interaction terms and the inclusion of time and sector dummies, were conducted to validate the consistency of the synergy and complementarity results.

Following prior studies (Alarussi and Gao 2021), the dynamic GMM model is expressed as:

Non-linear Effect of CSR on Stakeholder and shareholder profitability [Models 1–2]

$$ROA_{i,t} = \beta_1 ROA_{i,t-1} + \beta_2 CSR_{i,t} + \beta_3 [CSR_{i,t} * CSR_{i,t}] + \beta_4 CEODUA_i + \beta_5 BZISE_{i,t} + \beta_6 BGEN_{i,t} + \beta_7 BIND_{i,t} + \beta_8 AUDITIND_{i,t} + \beta_9 LIQ_{i,t} + \beta_{10} TANG_{i,t} + \beta_{11} LEV_{i,t} + \beta_{12} FSIZE_{i,t} + \beta_{13} EFFI_{i,t} + \pi_t + \alpha_j + \varepsilon_{i,t}$$

FIGURE 1 Model 1.

$$ROE_{i,t} = \beta_1 ROE_{i,t-1} + \beta_2 CSR_{i,t} + \beta_3 [CSR_{i,t} * CSR_{i,t}] + \beta_4 CEODUA_i + \beta_5 BZISE_{i,t} + \beta_6 BGEN_{i,t} + \beta_7 BIND_{i,t} + \beta_8 AUDITIND_{i,t} + \beta_9 LIQ_{i,t} + \beta_{10} TANG_{i,t} + \beta_{11} LEV_{i,t} + \beta_{12} FSIZE_{i,t} + \beta_{13} EFFI_{i,t} + \pi_t + \alpha_j + \varepsilon_{i,t}$$

FIGURE 2 Model 2.

Synergetic and Complementarity Effects of CSR indicators on Stakeholder profitability [Models 3–5]

$$ROA_{i,t} = \beta_1 ROA_{i,t-1} + \beta_2 CSRSOC * CSRENV_{i,t} + \beta_3 CEODUA_i + \beta_4 BZISE_{i,t} + \beta_5 BGEN_{i,t} + \beta_6 BIND_{i,t} + \beta_7 AUDITIND_{i,t} + \beta_8 LIQ_{i,t} + \beta_9 TANG_{i,t} + \beta_{10} LEV_{i,t} + \beta_{11} FSIZE_{i,t} + \beta_{12} EFFI_{i,t} + \pi_t + \alpha_j + \varepsilon_{i,t}$$

FIGURE 3 Model 3.

$$ROA_{i,t} = \beta_1 ROA_{i,t-1} + \beta_2 CSRSOC * CSRGOV_{i,t} + \beta_3 CEODUA_i + \beta_4 BZISE_{i,t} + \beta_5 BGEN_{i,t} + \beta_6 BIND_{i,t} + \beta_7 AUDITIND_{i,t} + \beta_8 LIQ_{i,t} + \beta_9 TANG_{i,t} + \beta_{10} LEV_{i,t} + \beta_{11} FSIZE_{i,t} + \beta_{12} EFFI_{i,t} + \pi_t + \alpha_j + \varepsilon_{i,t}$$

FIGURE 4 Model 4.

$$ROA_{i,t} = \beta_1 ROA_{i,t-1} + \beta_2 CSRGOV * CSRENV_{i,t} + \beta_3 CEODUA_i + \beta_4 BZISE_{i,t} + \beta_5 BGEN_{i,t} + \beta_6 BIND_{i,t} + \beta_7 AUDITIND_{i,t} + \beta_8 LIQ_{i,t} + \beta_9 TANG_{i,t} + \beta_{10} LEV_{i,t} + \beta_{11} FSIZE_{i,t} + \beta_{12} EFFI_{i,t} + \pi_t + \alpha_j + \varepsilon_{i,t}$$

FIGURE 5 Model 5.

Synergetic and Complementarity Effects of CSR indicators on shareholder profitability [Models 6–8]

$$ROE_{i,t} = \beta_1 ROE_{i,t-1} + \beta_2 CSRSOC * CSRENV_{i,t} + \beta_3 CEODUA_i + \beta_4 BZISE_{i,t} + \beta_5 BGEN_{i,t} + \beta_6 BIND_{i,t} + \beta_7 AUDITIND_{i,t} + \beta_8 LIQ_{i,t} + \beta_9 TANG_{i,t} + \beta_{10} LEV_{i,t} + \beta_{11} FSIZE_{i,t} + \beta_{12} EFFI_{i,t} + \pi_t + \alpha_j + \varepsilon_{i,t}$$

FIGURE 6 Model 6.

$$ROE_{i,t} = \beta_1 ROE_{i,t-1} + \beta_2 CSRSOC * CSRGOV_{i,t} + \beta_3 CEODUA_i + \beta_4 BZISE_{i,t} + \beta_5 BGEN_{i,t} + \beta_6 BIND_{i,t} + \beta_7 AUDITIND_{i,t} + \beta_8 LIQ_{i,t} + \beta_9 TANG_{i,t} + \beta_{10} LEV_{i,t} + \beta_{11} FSIZE_{i,t} + \beta_{12} EFFI_{i,t} + \pi_t + \alpha_j + \varepsilon_{i,t}$$

FIGURE 7 Model 7.

$$ROE_{it} = \beta_1 ROE_{it-1} + \beta_2 CSRGOV * CSRENV_{it} + \beta_3 CEODUA_i + \beta_4 BZISE_{it} + \beta_5 BGEN_{it} + \beta_6 BIND_{it} + \beta_7 AUDITIND_{it} + \beta_8 LIQ_{it} + \beta_9 TANG_{it} + \beta_{10} LEV_{it} + \beta_{11} FSIZE_{it} + \beta_{12} EFFI_{it} + \pi_t + \alpha_j + \varepsilon_{it}$$

FIGURE 8 Model 8.

Models 1 and 2 address the nonlinear effects of CSR on stakeholders and shareholders, respectively. Similarly, Models 3–5 and 6–8 present results on the synergetic and complementarity effects on stakeholder and shareholder profitability, respectively.

3.2 | Variable definition and measurement

In the models, stakeholder and shareholder profitability are dependent variables, represented by return on assets and return on equity, respectively. Following prior studies (Inkpen and Sundaram 2022), return on assets reflects stakeholder profitability, while return on equity reflects shareholder profitability; hence, this study measures stakeholder and shareholder profitability accordingly. In terms of corporate social responsibility, three (3) indicators, including social (CSRSOC), environmental (CSRENV) and governance (CSRGOV) responsibilities, are employed. It is anticipated that CSR indicators will have a non-linear inverted U-shape effect on both stakeholder and shareholder profitability following prior studies (Alfalih 2023, Lahouel et al. 2022). It is argued that CSR promotes profitability depending on the costs and benefits associated with CSR activities. When CSR costs exceed its benefits, a negative nexus is expected between CSR and profitability; conversely, when CSR costs fall below its benefits, a positive nexus is expected.

In light of this, the present study argues that CSR may initially boost profitability by reducing costs, but excessive levels of CSR could decrease profitability because its costs outweigh its benefits (Zheng et al. 2022, Lahouel et al. 2022). Similarly, a positive synergistic effect between CSR activities and profitability is expected when CSR initiatives are properly aligned, managed, coordinated, and implemented. Conversely, a negative synergistic effect is anticipated when CSR activities have substitutive effects. Therefore, CSR is likely to have nonlinear, synergistic, and complementary impacts on both stakeholder and shareholder profits.

The situation where the CEO doubles as the board chairperson (CEO-DUA) is regarded as a weak governance structure because it reflects concentration of corporate power and is captured as a dummy which assumes the value 1 when the CEO is the same as the board chairperson and otherwise 0 (Bansal et al. 2023, Gonçalves et al. 2022, Jebran et al. 2023). Thus, a negative effect is expected between CEO duality and profitability. Board size (BSIZE) is measured as the number of board members and is expected to promote profitability because board members employ the skills, competencies, and capabilities to advance corporate goals (Cheng 2008). Board gender (BGEN) is captured as the number of female board members divided by the total number of board members. Female board members are expected to promote profitability because females present unique and diverse skills and competencies that complement those of male board members (Arayssi et al. 2019).

However, the critical mass theory advances that the effect of female board members can be positive or negative depending on their number on the board. Board independence (BIND) measures the board's independence from internal/executive board members and is assessed by the number of non-executive members. The literature posits that non-executive members introduce new ideas and scrutinise the performance of executive board members, thereby promoting profitability. However, when scrutiny becomes antagonistic, then non-executive members may impede profitability (Dahya and McConnell 2005). Audit independence (AUDITIND) captures the extent to which the board audit committee is autonomous in scrutinising firms' financial statements to prevent the misappropriation of funds. It is expected to promote corporate performance. In terms of liquidity (LIQ), measured as cash-to-total current assets, a negative nexus is expected between liquidity and profitability. This is supported by the trade-off concept between liquidity and profitability (Bibi and Amjad 2017, Rodríguez et al. 2024). Under the going concern concept in accounting, tangibility (TANG), which represents fixed assets, is considered an economic resource of a firm and is expected to assist its operations in creating value. Hence, a positive relationship may exist between tangibility and profitability. However, a negative nexus may exist between tangibility and profitability when fixed assets are obsolete and require more repairs and maintenance. Financial leverage (LEV) refers to firms' use of debt financing to supplement equity capital. Leverage may have a positive effect on profit because it complements equity capital in financing the firm, whereas a negative effect may arise when the interest charged on debt is high (Dalci 2018, Yoon and Jang 2005, Baker 1973). Firm size (FSIZE) is measured with the natural log of total assets, and it is argued to either have positive or negative effects on profitability following the economies of scale and diseconomies of scale concepts, respectively (Alarussi and Gao 2021, Hall and Weiss 1967). Following the profit determination process using the income statement method, operating cost (EFFI) is deducted from revenue to arrive at profit. Hence, a negative relationship is expected between cost and profit. The period selected for the study, and the number of firms in the sample, were based on data availability. Table 1.1 below provides the variable description and measurement.

4 | EMPIRICAL RESULTS

In this section, the main results and their auxiliary analysis and tests are reported and discussed.

4.1 | Descriptive statistics

First, the auxiliary analysis and tests are briefly presented and discussed. In Table 1.2, outliers that could potentially compromise the quality of the results are identified using the mean, minimum, maximum, and standard deviation. From the table, there is no evidence of outliers. Additionally, natural logs and ratio analysis are performed to ensure data normality and to minimise outlier effects.

TABLE 1 Variable description and measurement

Variable	Measurement
Response variable-Profitability	
Return on equity (ROE)	Net Profit divided by total shareholders' equity
Return on asset (ROA)	Profit before interest and tax divided by total assets
Explanatory variables-CSR	
Environmental CSR index (ENV)	Environmental CSR index takes account of issues of the environment as captured in the annual reports of the firms. It represents accountability on issues of the environment as addressed by the firm. Examples of areas of interest as per GRI considered for developing the environmental CSR index include energy disclosure, biodiversity disclosure, water related disclosures, emission related disclosures, environmental reporting disclosures, and waste management disclosures.
Social CSR Index (SOC)	The social CSR index is developed by taking into account issues on the society as captured in the annual report of the firms. The index considers the various issues relating to the society as a whole as addressed and contained in the annual reports. To develop the index, the social issues considered include health and safety disclosures, customer and complaints disclosures, donations to external communities, human rights disclosures, product quality and safety disclosures, community development disclosures, and other philanthropic disclosures.
Governance CSR index (GOV)	This is an index formed through the consideration of issues relating to the internal governance and internal stakeholders of the firm as disclosed in the annual report of the firms. In developing the index, the areas considered include board remuneration disclosure, risk disclosures, disclosure of CEO role, disclosure on leadership ethics, disclosure on board composition, disclosure on executive composition, disclosure on transparency and reporting, and disclosures relating to stakeholder management and treatment.
Control variables	
Liquidity (LIQ)	Current assets divided by current liabilities
Tangibility (TANG)	Property plant and equipment divided by total assets
Leverage (LEV)	Total liabilities/total assets
Firm size (FSIZE)	Natural log of total assets
Management efficiency (cost-to-income ratio) (ME)	Total operating cost divided by total revenue
CEO duality (CEO DUAL)	Binary variable which takes the value 1 if the same person occupies the position of CEO and board chairperson, otherwise 0.
Board size (BDSIZE)	Total number of directors on a board for a year
Board gender diversity (PFMOB)	Total number of females on board divided by the total number of directors on the board multiplied by 100
Board independence (BDIND)	Number of non-executive directors on board divided by the total number of directors on the board multiplied by 100
Audit committee independence (AUCIND)	Number of non-executive directors on the audit committee annually

Source: Author's own construct

TABLE 2 Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
ROA	6645	.108	.207	-.961	.994
ROE	6645	.148	.304	-.968	.997
CSRSOC	5888	.365	.219	0	1
CSRENV	5961	.149	.21	0	1
CSRGOV	5972	.469	.194	0	1
LIQ	6186	1.221	15.663	-.66	1147.23
TANG	6486	45.107	31.865	-3.95	100
LEV	6486	67.662	704.654	-5.24	55738.629
FSIZE	5910	5.356	.932	2.72	8.28
COST	6463	25.041	.009	25.041	25.737
CEODUAL	4598	.336	.472	0	1
BSZIE	6292	9.781	3.012	3	27
BGEN	6292	14.066	12.09	0	66.67
BIND	6250	72.11	13.158	25	100
AUDITIND	6232	79.845	25.585	0	120

4.2 | Correlation result

4.3 | Regression results and discussion

The main results are reported in Tables 1.5 and 1.6 and show the connection between CSR and stakeholder and shareholder profitability. While Table 1.5 controls for both technological and industry effects, Table 1.6 only presents results on the relationship between CSR and shareholder profitability. Each Table displays 12 models: the first six examine the relationship between CSR and stakeholders, while the last six focus on CSR and shareholder profitability. The results are presented and discussed based on the study's hypotheses.

4.3.1 | Existence of Non-linear Threshold Effect of CSR on Profitability

Examining the effect of CSR on corporate stakeholder and shareholder profitability, it is observed that a significant non-linear nexus exists for social (CSRSOC) (Model 7) and governance (CSRGOV) (Model 9)

corporate social responsibilities on only corporate shareholder profitability. The non-linear effects of both social and governance corporate social responsibilities exhibit inverted U-shape effects, indicating that initial levels of both social and governance corporate social responsibilities promote corporate shareholder profitability, but reduce corporate shareholder profitability at extreme levels of social and governance corporate social responsibilities.

Using the threshold computation by Lind and Mehlum (2010) as indicated in equation 3, it is observed that the threshold points beyond which social and governance corporate social responsibility may be harmful to corporate shareholder profitability are 65.41% and 56.37%, respectively. Evidently, corporate shareholder profitability is optimised at 65.41%, and social and governance responsibilities are optimised at 56.37%, respectively. Similarly, Chowdhury et al. (2024), using data from 26 Indian and 30 Bangladeshi banks covering the period 2015 to 2021, employed the panel VAR and non-linear dynamic GMM models and revealed a U-shaped association. The threshold regression demonstrates a tipping point for return on equity, Tobin's-Q, and earnings to assets for banks in Bangladesh and India. Furthermore, this study demonstrates a negative (positive) correlation between bank performance before (after) the tipping point and CSR expenditure. They further show that optimal CSR improves the bank's profitability, while lower CSR has no marginal benefit and instead raises costs. Therefore, in order to reap the benefits of corporate social responsibility, bank management and policymakers should invest with the threshold level in mind.

4.3.2 | Existence of Synergetic-Complementarity Effects of CSR on Corporate Profitability

Examining the synergetic and complementary effects of corporate social responsibilities on corporate stakeholder and shareholder profitability, the study follows prior studies that use the sign in front of the interactive term to determine synergies and complementarities (Cuervo-Cazurra et al. 2023, Bamiatzi et al. 2024, Cavaco and Crifo 2014). The results show that synergistic and complementary effects exist between social and governance corporate social responsibility and corporate shareholder profitability (Model 12), and between social and environmental corporate social responsibility and corporate stakeholder profitability (Model 16). These show that undertaking social and governance corporate social responsibilities together and social and environmental corporate social responsibilities together produce synergetic-complementary effects that enhance the profitability of shareholders and stakeholders, respectively.

4.3.3 | Existence of Long-run non-linear and synergetic Effects on Corporate Profitability

In examining the long-run synergistic and threshold effects of CSR on the profitability of stakeholders and shareholders, the study employs the approach used in prior studies, as indicated in equation 2 (Quadrat-Ullah and Nevo 2021). In terms of testing for the long-run threshold point effects (see Table 1.4) of CSR on corporate profitability, it is observed that a long-run inverted U-shape effect exists just like in the short-run, implying that beyond a certain threshold/level of governance and social CSR activities, it may dampen shareholder profitability. Interestingly, the long-run threshold points are similar to the short-run threshold points and apply only to corporate shareholder profitability. These indicate that both stakeholders and shareholders seem to benefit in the short and long run from the synergistic effects of social and governance CSR activities, whereas non-linear social and governance CSR activities serve only shareholder profitability.

TABLE 3 Pairwise correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1) ROA	1.000														
(2) ROE	0.683*	1.000													
(3) CSRSOC	0.056*	0.033*	1.000												
(4) CSRENV	0.054*	0.018	0.515*	1.000											
(5) CSRGOV	-0.023*	-0.005	0.494*	0.460*	1.000										
(6) LIQ	0.038*	0.020	-0.024*	-0.030*	0.009	1.000									
(7) TANG	0.015	-0.139*	0.070*	0.070*	0.039*	-0.039*	1.000								
(8) LEV	-0.104*	-0.044*	-0.018	0.006	0.003	-0.003	-0.022*	1.000							
(9) FSIZE	-0.011	0.087*	0.399*	0.477*	0.460*	-0.030*	-0.172*	-0.018	1.000						
(10) COST	-0.004	-0.004	0.024*	0.022*	0.027*	0.000	0.018	0.000	0.008	1.000					
(11) CEODUAL	-0.101*	-0.073*	-0.115*	-0.350*	-0.359*	-0.005	-0.138*	-0.006	-0.278*	-0.011	1.000				
(12) BSIZE	-0.002	0.039*	0.324*	0.373*	0.298*	-0.014	-0.095*	-0.013	0.604*	-0.008	-0.078*	1.000			
(13) BGEN	0.016	0.006	0.204*	0.260*	0.283*	-0.003	-0.039*	0.056*	0.238*	0.001	-0.180*	0.144*	1.000		
(14) BIND	-0.028*	-0.002	-0.014	0.078*	0.057*	0.017	0.066*	0.012	0.062*	0.003	-0.262*	0.108*	0.077*	1.000	
(15) AUDITIND	0.085*	0.070*	0.084*	0.255*	0.232*	0.012	0.085*	0.009	0.237*	0.011	-0.779*	0.091*	0.129*	0.259*	1.000

Notes: *** p<0.01, ** p<0.05, * p<0.1.

TABLE 4 Long-run synergistic and threshold effects of CSR activities on corporate profitability

Effect Type	CSR Components	Profitability Measure	Formula	Coefficient	Std. Error	z	P>z	95% Conf. Interval
Synergetic Effects	Social × Governance	Shareholder (ROE)	$(b_{\text{gov}} \times \text{soc}) / (1 - b_{\text{[l.roe]}})$	0.11	0.055	1.98	0.048*	0.001–0.218
Synergetic Effects	Environmental × Social	Stakeholder (ROA)	$(b_{\text{env}} \times \text{soc}) / (1 - b_{\text{[l.roanew]}})$	0.093	0.041	2.26	0.024*	0.013–0.174
Synergetic Effects	Social × Governance	Shareholder (ROE-alt)	$(b_{\text{gov}} \times \text{soc}) / (1 - b_{\text{[l.roenew]}})$	0.119	0.055	2.14	0.032*	0.010–0.227
Threshold Effects (Governance)	Governance (Linear)	Shareholder (ROE)	$(b_{\text{gov}}) / (1 - b_{\text{[l.roenew]}})$	0.369	0.189	1.95	0.051	-0.742
	Governance (Squared)	Shareholder (ROE)	$(b_{\text{gov}} \times \text{gov}) / (1 - b_{\text{[l.roenew]}})$	-0.348	0.183	-1.90	0.057	-0.718
	Governance (Linear, Alt)	Shareholder (ROE)	$(b_{\text{gov}}) / (1 - b_{\text{[l.roenew]}})$	0.378	0.186	2.03	0.042*	0.014–0.742
	Governance (Squared, Alt)	Shareholder (ROE)	$(b_{\text{gov}} \times \text{gov}) / (1 - b_{\text{[l.roenew]}})$	-0.335	0.178	-1.88	0.060	-0.698
Threshold Effects (Social)	Social (Linear)	Shareholder (ROE)	$(b_{\text{soc}}) / (1 - b_{\text{[l.roenew]}})$	0.262	0.100	2.63	0.009**	0.067–0.458
	Social (Squared)	Shareholder (ROE)	$(b_{\text{soc}} \times \text{soc}) / (1 - b_{\text{[l.roenew]}})$	-0.200	0.108	-1.86	0.064	-0.423

Notes: *** p<0.01, ** p<0.05, * p<0.1.

TABLE 5 Effect of CSR on corporate stakeholder and shareholder profitability[illegible]

TABLE 6 Effect of CSR on corporate stakeholder and shareholder profitability: additional estimations

VARIABLES	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
	Corporate Stakeholder Profitability	Corporate Stakeholder Profitability	Corporate Stakeholder Profitability	Corporate Stakeholder Profitability	Corporate Stakeholder Profitability	Corporate Stakeholder Profitability	Corporate Stakeholder Profitability	Corporate Stakeholder Profitability	Corporate Stakeholder Profitability	Corporate Stakeholder Profitability	Corporate Stakeholder Profitability	Corporate Stakeholder Profitability
LRDA	0.4704** (0.1952)	0.4696** (0.1929)	0.4610** (0.1920)	0.4786** (0.1927)	0.4716** (0.1906)	0.4774** (0.1922)	0.2589** (0.0414)	0.2597** (0.0419)	0.2583** (0.0420)	0.2627** (0.0432)	0.2593** (0.0419)	0.2628** (0.0419)
LRDE	0.0631 (0.0371)	0.0636 (0.0357)					0.1567** (0.0456)					
CSROCK							-0.1029 (0.0807)					
CSREN		0.0164 (0.0356)						0.0488 (0.0709)				
CSREN		0.0187 (0.0509)						-0.0184 (0.1127)				
CSROGV			0.0889 (0.0656)						0.2760* (0.1405)			
CSROGV			-0.0917 (0.0618)						-0.2282* (0.1366)			
CSROCK*CSROGV				0.0486* (0.0289)						0.0223 (0.0410)		
CSROCK*CSREN					0.0377 (0.0228)						0.0503 (0.0417)	
CSROCK*CSROGV						0.0296 (0.0256)						0.0809** (0.0405)
CSROCK*CSROCK							0.0026** (0.0012)					0.0034*** (0.0012)
LEV	-0.0002** (0.0000)	-0.0002** (0.0000)	-0.0002** (0.0000)	-0.0002** (0.0000)	-0.0002** (0.0000)	-0.0002** (0.0000)	-0.0008** (0.0002)	-0.0008** (0.0002)	-0.0007** (0.0002)	-0.0007** (0.0002)	-0.0007** (0.0002)	-0.0007** (0.0002)
SIZE	-0.0000 (0.0000)	-0.0000 (0.0000)	-0.0000 (0.0000)	-0.0000 (0.0000)	-0.0000 (0.0000)	-0.0000 (0.0000)	-0.0000 (0.0000)	-0.0000 (0.0000)	-0.0000 (0.0000)	-0.0000 (0.0000)	-0.0000 (0.0000)	-0.0000 (0.0000)
COF	-0.0097** (0.0044)	-0.0096** (0.0045)	-0.0096** (0.0045)	-0.0095** (0.0045)	-0.0095** (0.0045)	-0.0097** (0.0045)	-0.0150** (0.0083)	-0.0149** (0.0088)	-0.0154** (0.0088)	-0.0156** (0.0088)	-0.0150** (0.0088)	-0.0143** (0.0088)
CECDDA	-0.0038 (0.0038)	-0.0038 (0.0038)	-0.0038 (0.0038)	-0.0038 (0.0038)	-0.0038 (0.0038)	-0.0038 (0.0038)	-0.0038 (0.0038)	-0.0038 (0.0038)	-0.0038 (0.0038)	-0.0038 (0.0038)	-0.0038 (0.0038)	-0.0038 (0.0038)
BSIZE	-0.0003 (0.0003)	-0.0003 (0.0003)	-0.0003 (0.0003)	-0.0003 (0.0003)	-0.0003 (0.0003)	-0.0003 (0.0003)	-0.0003 (0.0003)	-0.0003 (0.0003)	-0.0003 (0.0003)	-0.0003 (0.0003)	-0.0003 (0.0003)	-0.0003 (0.0003)
BGEN	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)
BINDE	0.0002 (0.0002)	0.0002 (0.0002)	0.0002 (0.0002)	0.0002 (0.0002)	0.0002 (0.0002)	0.0002 (0.0002)	0.0002 (0.0002)	0.0002 (0.0002)	0.0002 (0.0002)	0.0002 (0.0002)	0.0002 (0.0002)	0.0002 (0.0002)
AUDITCOMIND	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)
Constant	0.0000 (0.0331)	0.0000 (0.0342)	0.0000 (0.0327)	0.0000 (0.0346)	0.0000 (0.0353)	0.0000 (0.0347)	0.0000 (0.0553)	0.0000 (0.0550)	0.0000 (0.0568)	0.0000 (0.0570)	0.0000 (0.0558)	0.0000 (0.0555)
Year Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	42	42	42	42	42	42	42	42	42	42	42	42
Turning Point	2.2	2.2	2.2	2.7	2.7	2.7	2.9	2.9	2.9	2.9	2.9	2.9
ARI1	-4.1700	-4.1900	-4.1900	-4.2400	-4.2500	-4.2600	-7.3800	-7.4000	-7.4000	-7.3500	-7.4100	-7.4200
ARI2	1.40162	1.410158	1.398163	1.430152	1.420156	1.420155	-0.060953	-0.060954	-0.060954	-0.060954	-0.060954	-0.060954
Sargan	0.1116	0.1116	0.1116	0.110241	0.110242	0.110243	0.092009	0.092009	0.092009	0.092009	0.092009	0.092009
Number of codes	369	369	369	369	369	369	369	369	369	369	369	369

Notes: Standard errors are reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

5 | DISCUSSION

This finding is consistent with evidence from prior studies (Alfalih 2023, Lahouel et al. 2022) showing that corporate social responsibility enhances profitability below certain thresholds. The finding shows that beyond a certain threshold of CSR, it may be injurious to corporate shareholder profitability. These suggest that social and environmental CSR, and governance CSR, are well aligned, coordinated, and managed to yield the desirable synergistic-complementary effects on stakeholder and shareholder profitability, respectively. Again, the results show that the synergistic and complementary effects between social and governance CSR on shareholder profits, and between social and environmental CSR on stakeholder profits, that exist in the short run also persist in the long run. This finding is consistent with practice-oriented perspectives on sustainability, which emphasise that sustainability outcomes depend less on the mere adoption of formal commitments than on how practices are combined, coordinated, and embedded in organisational routines (Lissillour and Silva 2024).

Similar findings were reported by Oh et al. (2018), who investigated whether different governance frameworks support CSR in complementary or alternative ways. Using a panel sample of American companies from 2004 to 2010, we found that various governance mechanisms primarily serve as stand-ins for CSR. Our results imply that various combinations of governance structures can yield comparable levels of CSR. Our research advances the theoretical and practical domains of corporate governance and corporate social responsibility. This result provides novel insights into the CSR-corporate performance nexus by indicating which CSR activities are well-aligned and coordinated to enhance corporate performance.

This shows that the synergistic and complementary effects of CSR activities affect the profits of stakeholders and shareholders in both the short and long run. Thus, while corporate entities can benefit from well-aligned and coordinated CSR activities, the effects are greater in the long run than in the short run.

6 | CONCLUSION

This study investigates the non-linear effects, synergies, complementarities, and long-term impacts of corporate social responsibility (CSR) on corporate profitability, categorised into stakeholder profitability and shareholder profitability. Motivated by the scarcity of empirical evidence on the short-term and long-term non-linear and synergistic effects of CSR activities on stakeholder and shareholder profitability, this research provides such evidence to enhance understanding of the CSR-corporate performance relationship, particularly within the African context. Specifically, this study aims to (i) identify the existence of non-linear threshold effects of CSR activities on stakeholder and shareholder profitability, (ii) establish the presence of synergistic and complementary effects of CSR activities on these profits, and (iii) estimate and examine the long-term synergistic and non-linear threshold effects of

CSR activities on stakeholder and shareholder profitability. The research employs a dynamic GMM panel data approach, analysing data from 369 listed firms in Africa between 2006 and 2020.

The main results show that an inverted non-linear threshold effect of social and governance CSR on shareholder profitability exists, but not on stakeholder profitability, indicating that social and governance CSR may be injurious to corporate shareholder profitability beyond a certain threshold. Similarly, the study documents synergistic and complementary effects between social and governance CSR on shareholder profitability, and between social and environmental CSR on stakeholder profitability. These show that CSR in governance and CSR in environmental and social areas complement each other to enhance shareholder and stakeholder profitability, respectively. Furthermore, the study documents a long-run inverted U-shaped effect of social- and governance-oriented CSR on shareholder profitability and a long-run synergistic nexus between social- and governance-oriented CSR and environmental and social CSR on shareholder and stakeholder profitability, respectively. These imply that the synergetic and non-linear effects of CSR activities exist beyond the short run.

The findings of this study offer valuable insights and actionable recommendations for managers, shareholders, and stakeholders of listed firms in Africa. Given the complex relationship between corporate social responsibility (CSR) and corporate profitability, decision-makers must carefully design their CSR strategies to maximise benefits while minimising risks. Given the study's findings, the following recommendations are made:

First, it is advisable for firms to perform regular evaluations of the financial effects of their CSR initiatives, using metrics such as Return on CSR Investment (ROCI), to ensure that CSR activities yield positive net benefits. This will help ensure firms pursue initiatives with the potential for long-term gains. Furthermore, it is recommended that firms create sector-specific CSR budgeting models that allocate resources efficiently, ensuring CSR spending remains within profit-maximising limits, and conduct annual CSR impact assessments to assess whether CSR initiatives contribute to corporate profitability or impose financial burdens.

6.1 | Theoretical Contributions

Edjoukou et al. (2022) found that, with the exception of ROE, CSRD has a long-term positive correlation with every profitability measure. Therefore, the results demonstrate that CSR initiatives do not yield results immediately. CSR initiatives have a favourable impact on a company's financial success in the years that follow their implementation. Therefore, to generate significant profit, managers should be mindful that social practices are integral to the overall corporate strategy.

Secondly, the paper emphasises the need for differentiated CSR policy frameworks across sectors. The empirical results show that the efficacy of CSR initiatives is contingent on both their type and sector application, echoing the conclusions of García-Sánchez and García-Meca (2017), who find that CSR impacts vary significantly by sectoral and regional factors. Therefore, regulators, firm managers, and boards should

design CSR strategies that are not only consistent with stakeholder expectations but also strategically aligned with sector-specific priorities. The documented short- and long-run positive effects of CSR on firm performance, particularly when initiatives are well-targeted, are consistent with Malik (2015), who highlights that CSR can be a long-term investment in reputational capital. Importantly, the findings encourage firms to explore the threshold effects and synergies of CSR initiatives to ensure their sustainability and profitability, in line with the non-linear CSR-performance relationship found by Nollet et al. (2016), and Lahouel and Taleb (2025).

6.2 | Policy Implications

Rather than implementing CSR initiatives separately, companies should develop integrated CSR frameworks that encompass social, environmental, and governance (ESG) activities to enhance their effectiveness. Considering the long-term benefits, it is also advisable for firms and management to engage key stakeholders such as customers, employees, investors, and local communities in CSR decision-making to align efforts with stakeholder expectations and support ongoing profitability. The managerial implications also suggest that CSR should be treated as a learning process through which firms develop routines, capabilities, and evaluative mechanisms for implementing sustainability practices effectively (Lissillour 2025).

Additionally, managers and shareholders are cautioned about the dark side of CSR activities and must be mindful to remain within optimal CSR margins to promote corporate profitability. Thus, undertaking excessive CSR activities can undermine shareholder profitability; hence, managers and shareholders must be mindful of the threshold points that erode corporate profitability. Also, managers must be cautious in selecting and combining CSR activities, as those undertaken together can produce synergies and complementarities that boost both stakeholder and shareholder profitability when properly aligned and coordinated. Lastly, the results on the long-run effect of CSR provide additional justification for managers to invest in and engage in CSR activities, especially when CSR has positive, long-lasting synergistic effects on shareholder and stakeholder profitability.

6.3 | Limitations and Future Research

Despite the enormous and invaluable contributions this paper makes to the body of knowledge and practice in corporate governance, CSR and corporate profitability, a few limitations can be identified in the research. Firstly, the research focused only on listed firms in Africa, without examining the dynamics of non-listed firms and firms outside Africa; thus, the findings might not accurately reflect the wide-ranging effects of different industries and regions outside Africa. Secondly, the analysis of the relationships among the key variables did not include a comparative study of firms across different regions of Africa, such as North Africa versus South Africa or West Africa versus East Africa, which could

have enriched the results and analysis. Thirdly, apart from the dynamic Generalised Method of Moments (GMM) regression model used in this research, other models could have been applied; for example, a purely non-linear model. That notwithstanding, there is a strong justification for using the model across all relevant areas of the study.

Future research could interrogate the relationships between corporate governance and corporate profitability of both listed and non-listed firms in Africa, or include listed firms outside Africa. Secondly, comparative research on the nexus between corporate governance and corporate profitability among listed firms located in different sub-regions of Africa, such as North Africa versus South Africa, or West Africa versus East Africa and in developed and developing countries, would surely offer useful contributions to the literature. Thirdly, applying machine learning and decision tree models to examine the nexus between corporate governance and corporate profitability could offer current and exciting perspectives to the discourse. Lastly, research examining the gender perspectives on the relationships between corporate governance and corporate profitability could provide a valuable new dimension to the existing literature. Future research could further examine how CSR thresholds and complementarities are shaped by power asymmetries, institutional inequalities, and uneven stakeholder capacities in African markets (Lissillour 2024).

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FINANCIAL DISCLOSURE

None reported.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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