
Board Capital, CEO Green Efficacy and Adoption of Green Finance Among Firms in the Financial Services Sector in Kenya

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Abstract:

Purpose: This study examined the effect of board human capital on the adoption of green finance among firms in Kenya's financial services sector, with chief executive officer green efficacy as a moderator.

Material/methods: The study was guided by agency theory, the natural resource-based view, social capital theory and upper echelons theory, and adopted a positivist philosophy and an explanatory survey design. The sampling frame comprised 90 institutions, including 43 commercial banks, nine microfinance institutions and 38 deposit-taking savings and credit cooperative organizations (SACCOs). A census of the institutions was combined with purposive selection of the board chairperson, CEO and company secretary, targeting 270 respondents. Of the 211 questionnaires returned, 164 were usable, representing 60.74% of the questionnaires distributed. Data analysis involved descriptive statistics, Pearson correlation, multiple regression and hierarchical regression.

Findings: Board education, experience and functional diversity were positively associated with green finance adoption. In addition, board interlocks and prestige also had positive associations, while directors' relationships with the CEO had a negative association. CEO green efficacy strengthened the education–adoption relationship and the interlocks–adoption relationship. Its interactions with board experience and functional diversity were not statistically significant.

Conclusion: The study concludes that board capabilities and external connections are relevant to green finance adoption, although their associations differ across dimensions. The findings establish survey associations and do not demonstrate causation.

Value: It recommends strengthening board competencies, selecting directors with useful professional networks, preserving independent oversight and developing CEOs' confidence in implementing environmental initiatives.

Keywords: Board human capital, Board social capital, CEO green efficacy, green finance adoption, corporate governance, financial services, Kenya.

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1. Introduction

Green finance concerns the allocation of financial resources to activities that support environmental protection and sustainable economic development. Wang and Zhi (2016) explain its contribution through market mechanisms and public policy, showing that financial decisions can influence the movement of resources towards environmentally beneficial activities. For financial institutions, the concept extends to decisions about financing clients and projects whose activities have environmental consequences. A lender's environmental contribution therefore depends on the activities it supports, as well as its own internal practices. Adoption requires institutions to incorporate environmental considerations into the way they evaluate opportunities, allocate funds and manage risk. This makes green finance relevant to economic resilience because investment choices can influence how businesses respond to changing environmental conditions and develop sustainable sources of growth.

In Kenya, the governance of climate-related financial risks has become a clear concern for the banking sector. The Central Bank of Kenya (CBK, 2021) issued guidance requiring institutions to integrate climate-related risks into their governance and risk management arrangements. In April 2025, CBK released the Kenya Green Finance Taxonomy and the Climate Risk Disclosure Framework for the banking sector. The taxonomy provides a basis for assessing whether economic activities support climate mitigation and adaptation, while the disclosure framework seeks to improve the usefulness and comparability of climate-related information (CBK, 2025). These developments give institutions a stronger basis for identifying environmental priorities. Their implementation also raises a practical governance question: whether boards and senior executives possess the capabilities needed to translate environmental expectations into financing decisions. Although the CBK measures concern banking institutions, the broader question of board capability is also relevant to microfinance institutions and deposit-taking savings and credit cooperative organisations (SACCOs) that make lending and investment decisions.

Board capital provides one way of examining this governance question. Hillman and Dalziel (2003) distinguish the resources directors bring to a board from the incentives that influence how they use those resources. Human capital concerns directors' knowledge, skills and experience, while social capital concerns the value available through their relationships and external connections. In the present study, board human capital comprised education, experience and functional diversity. Board social capital comprised interlocks, prestige and directors' relationships with the chief executive officer (CEO). These dimensions represent different potential contributions to green finance. Education may help directors understand complex environmental and financial information, while experience may improve judgement. Functional diversity may broaden the perspectives available during decision making. Interlocks may provide access to ideas from other institutions, and prestige may strengthen confidence in the institution's decisions. Relationships with the CEO can support communication, but their implications for independent oversight require separate examination.

Recent studies link board attributes with environmental reporting and sustainability outcomes. Nathalia and Setiawan (2022) found positive relationships between board capital and climate change disclosure among Indonesian banks. Lu et al. (2024) showed that sustainability experience acquired through board interlocks was associated with more transparent sustainability disclosure in United States firms. In European banking, Remo-Diez et al. (2025) examined combinations of board capital and CEO power associated with environmental, social and governance (ESG) performance. These

studies indicate that the contribution of a board depends on both its resources and its interaction with executive leadership. However, disclosure, ESG performance and the adoption of green finance represent different outcomes. The reviewed studies do not directly establish how the six board-capital dimensions examined here relate to green finance adoption across Kenyan banks, microfinance institutions and qualifying SACCOs. This study addressed that contextual and measurement gap by examining the dimensions separately and assessing whether CEO green efficacy changed selected relationships.

2. Theoretical Review

Agency theory explains governance in terms of the relationships between those who delegate authority and those who exercise it. Jensen and Meckling (1976) show that differences in interests and access to information can create agency costs. Boards can address these concerns by monitoring managerial decisions and seeking information that allows them to evaluate organisational choices. Applied to green finance, this perspective directs attention to whether directors can question proposed financing decisions and assess their environmental implications. Education and professional experience may strengthen this capacity. The theory also provides a basis for examining directors' relationships with the CEO because close relationships could affect the willingness to challenge executive decisions. In this study, agency theory informed the examination of board capabilities and the distinction between constructive board–CEO communication and relationships that may weaken independent judgement.

The natural resource-based view connects organisational resources and capabilities with the natural environment. Hart (1995) argues that environmental considerations can shape the capabilities through which firms develop competitive advantage. The relevance to financial institutions lies in the knowledge and organisational practices needed to identify environmentally beneficial financing opportunities and respond to environmental risks. In this study, board education, experience and functional diversity were treated as governance resources that could support those capabilities. Their proposed contribution was to improve the evaluation of environmental information and the consideration of green finance within strategic decisions. This application does not assume that having qualified directors automatically produces environmental gains. It proposes that board capabilities can create conditions that support adoption when institutions also have suitable implementation arrangements.

Social capital theory explains how relationships can support access to knowledge and other resources. Nahapiet and Ghoshal (1998) connect social capital with the creation and exchange of intellectual capital, emphasising the organisational value of social connections. This perspective informed the inclusion of board interlocks and prestige. Directors who serve on other boards may encounter relevant practices and professional contacts that can be useful to the focal institution. Prestige may reflect recognition that supports trust in the board's judgement. The study also considered directors' relationships with the CEO as an internal relational dimension. Its contribution may depend on how those relationships affect the exchange of information and the exercise of oversight. Social capital theory therefore supports examination of the different relational dimensions instead of treating all board relationships as having the same implication for green finance adoption.

Upper echelons theory proposes that organisational decisions partly reflect the background characteristics and interpretations of senior decision makers. Hambrick and Mason (1984) identify managerial characteristics as relevant to strategic choices and

organisational outcomes. In the present study, this perspective informed the expectation that board education, experience and functional backgrounds could shape how environmental financing opportunities are understood. It also provided a basis for examining the CEO's role in putting board decisions into practice. A board may identify suitable opportunities, while executive leadership determines whether the institution has the confidence and operational direction needed to pursue them. CEO green efficacy was consequently examined as a condition that could alter the relationship between board resources and adoption, rather than as a substitute for those resources.

The concept of CEO green efficacy also draws on the broader self-efficacy literature. Bandura (1977) explains self-efficacy as beliefs about one's capacity to carry out the actions needed for a task. Chen et al. (2015) applied green self-efficacy to environmental work and found that it contributed to the relationship between green shared vision and green creativity. For this study, CEO green efficacy referred to the CEO's perceived capability to guide the implementation of environmental initiatives. Its proposed moderating role was that a confident CEO could help translate board knowledge and external connections into action. This conceptual link supports testing interactions, while recognising that general evidence about green self-efficacy does not itself demonstrate CEO-level moderation of green finance adoption.

3. Empirical Review and Hypothesis Development

3.1 Board Education and Green Finance Adoption

Nathalia and Setiawan (2022) examined 191 bank-year observations from banks listed on the Indonesia Stock Exchange between 2016 and 2020. Their regression results showed that board education, experience and networking were positively associated with climate change disclosure. The education finding is relevant because directors must understand environmental information before they can assess its implications for institutional decisions. Raimo et al. (2025), using a sample of 107 publicly listed European banks, also found that board expertise was positively related to climate change disclosure. These studies concern reporting, but they support examination of the knowledge directors bring to environmental governance. For Kenyan financial institutions, the proposed connection is that education can support the evaluation of environmental financing proposals and the interpretation of information used in approving them. Formal qualifications alone may not capture competence in climate finance, so the hypothesis concerns the measured education dimension rather than a particular degree requirement. The study proposed that:

H1a: Board education is positively associated with the adoption of green finance among firms in Kenya's financial services sector.

3.2 Board Experience and Green Finance Adoption

The experience finding reported by Nathalia and Setiawan (2022) suggests that directors' backgrounds can be relevant to environmental governance. Lu et al. (2024) provide more specific evidence that sustainability experience obtained through service on other boards was associated with transparent sustainability disclosure. Their study examined United States S&P 1500 firms from 2009 to 2018. These findings point to a distinction between accumulated years of service and experience that is directly relevant to environmental decisions. An experienced board may be better placed to consider the practical requirements of new financial products, assess risks and draw lessons from earlier initiatives. However, experience with established financial practices may provide limited guidance where environmental financing presents unfamiliar questions. The present study tested whether the measured experience

dimension was associated with adoption without assuming that all professional experience had equal environmental relevance. Accordingly:

H1b: Board experience is positively associated with the adoption of green finance among firms in Kenya's financial services sector.

3.3 Board Functional Diversity and Green Finance Adoption

Wang (2022) investigated board human capital diversity and corporate innovation using data on S&P 1500 firms from 2000 to 2015. The study found a curvilinear relationship between board industry diversity and innovation, and showed that shared board tenure could help boards realise the benefits of diverse industry backgrounds. This evidence suggests that diversity creates opportunities for broader decision making, although its benefits depend on how directors work together. Raimo et al. (2025) also found a positive association between gender diversity and climate change disclosure in European banks. Gender and functional diversity are different constructs, so that result supports the broader relevance of board composition rather than directly validating the functional diversity measure used here. In financial institutions, differences in professional backgrounds may enable directors to examine environmental proposals from financial, legal, risk and operational perspectives. The study therefore expected functional diversity to be relevant to green finance adoption and proposed that:

H1c: Board functional diversity is positively associated with the adoption of green finance among firms in Kenya's financial services sector.

3.4 Board Interlocks and Green Finance Adoption

Lu et al. (2024) found that the sustainability experience of interlocked directors was associated with greater transparency in sustainability disclosure. The finding indicates that the environmental relevance of an external connection matters, as well as the existence of that connection. Nathalia and Setiawan (2022) similarly reported a positive association between board networking and climate change disclosure. For the present study, interlocks were considered a potential route through which directors could encounter green finance practices and gain access to useful professional knowledge. Directors serving on other boards may bring information about how environmental initiatives are assessed or organised elsewhere. The proposed benefit depends on directors applying that knowledge within the focal institution. Multiple appointments may also place demands on their time, so interlocks should not be interpreted as an unlimited governance advantage. The study assessed their relationship with adoption and hypothesised that:

H2a: Board interlocks are positively associated with the adoption of green finance among firms in Kenya's financial services sector.

3.5 Board Prestige and Green Finance Adoption

Muttakin et al. (2018) examined the relationship between directors' human and social capital and corporate social responsibility (CSR) disclosure among firms listed on the Dhaka Stock Exchange in Bangladesh. Their results indicated that board capital was positively associated with CSR disclosure. The study supports the broader relevance of directors' resources and external standing, but it does not isolate the prestige dimension used in this study. Prestige was therefore examined as a distinct potential contribution to green finance adoption. A board containing recognised directors may be better positioned to establish professional credibility for new initiatives and engage relevant stakeholders. Its value should depend on the substance of directors' contributions,

including whether they understand the environmental decisions under consideration. Since recognition and interlocks are related but different attributes, the study tested prestige independently instead of assuming that it duplicated the effects of external board appointments. The following hypothesis was developed:

H2b: Board prestige is positively associated with the adoption of green finance among firms in Kenya's financial services sector.

3.6 Directors' Relationships with the CEO and Green Finance Adoption

The contribution of internal board relationships is less straightforward than the contribution expected from education or access to external knowledge. Wang (2022) showed that shared experience among directors could improve the way diverse board resources were used, suggesting that internal working relationships can support collaboration. However, that finding concerns relationships among directors and does not establish the effect of directors' ties to the CEO. Muttakin et al. (2018) found that CEO power was negatively associated with CSR disclosure and weakened the relationship between board capital and disclosure. The implication for this study is that executive influence may change how board resources are exercised. Relationships with the CEO could facilitate communication, while excessive closeness could limit independent scrutiny. Because the two mechanisms could operate in different directions, the hypothesis was formulated without imposing a positive sign:

H2c: Directors' relationships with the CEO are significantly associated with the adoption of green finance among firms in Kenya's financial services sector.

3.7 CEO Green Efficacy and the Board Human Capital Relationships

Chen et al. (2015) found that green self-efficacy partly mediated the relationship between green shared vision and green creativity. More recently, Faris et al. (2025) studied 80 hospitality employees in Indonesia's Toba Caldera Geopark and found that green self-efficacy mediated relationships involving green knowledge, servant leadership and green innovation. These studies provide evidence that confidence in environmental tasks can be relevant to environmentally oriented action. They examine mediation in different organisational settings, so they do not demonstrate the moderating relationship investigated here. The present study proposed that a CEO's confidence in leading green initiatives could help put board knowledge into practice. Education, experience and functional diversity might consequently have stronger associations with adoption where CEO green efficacy was higher. Each interaction was considered separately because the board dimensions represent different resources. The following hypotheses were proposed:

H3a: CEO green efficacy positively moderates the relationship between board education and green finance adoption.

H3b: CEO green efficacy positively moderates the relationship between board experience and green finance adoption.

H3c: CEO green efficacy positively moderates the relationship between board functional diversity and green finance adoption.

3.8 CEO Green Efficacy and the Board Interlocks Relationship

Remo-Diez et al. (2025) examined board capital and CEO power configurations in European banks using data from 2018 to 2020 and fuzzy-set qualitative comparative analysis. They found that combinations of board resources and executive influence were relevant to ESG performance, with different configurations supporting different

outcomes. CEO power and CEO green efficacy are distinct constructs, but the study supports examining leadership conditions alongside board resources. In the present study, the proposed interlock mechanism was that external connections supply knowledge and opportunities, while the CEO's environmental confidence may help the institution act on them. A confident CEO may be more willing to coordinate the practical work needed to assess a green financing opportunity identified through the board's network. This is a proposed interpretation of moderation, not evidence that information transfer or implementation behaviour was directly measured. The study hypothesised that:

H4: CEO green efficacy positively moderates the relationship between board interlocks and green finance adoption.

The conceptual framework links the two forms of board capital with green finance adoption and places CEO green efficacy as a moderator of the specified relationships. Human capital is represented by board education, experience and functional diversity, while social capital is represented by interlocks, prestige and directors' relationships with the CEO. The framework distinguishes board resources from the leadership condition under which selected resources may be translated into adoption.

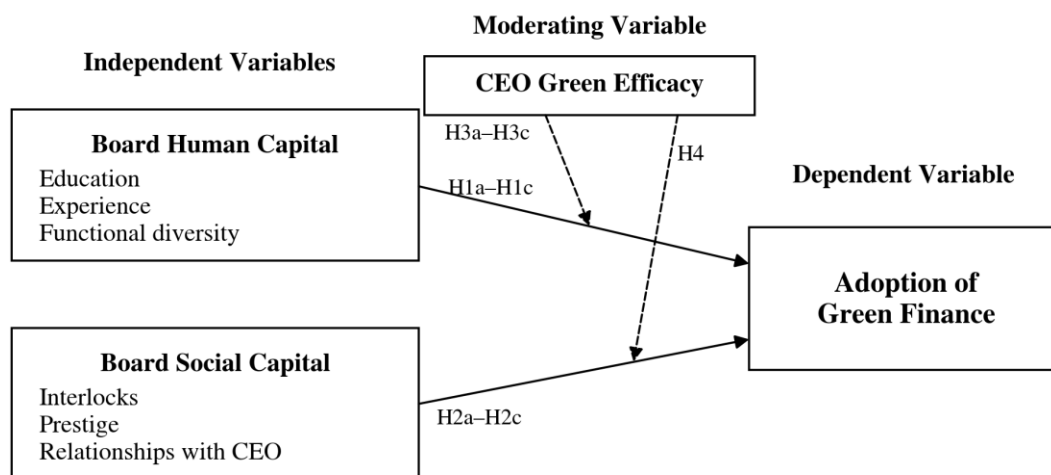


Figure 1. Conceptual Framework

4. Methodology

The study adopted a positivist research philosophy and an explanatory survey design. The philosophy supported the examination of measurable variables and the use of statistical analysis to evaluate the stated hypotheses. The study investigated the relationships between board-capital dimensions and green finance adoption, and assessed selected interactions with CEO green efficacy. The design enabled the collection of organisational information from senior respondents with knowledge of board composition, executive leadership and institutional practices. The resulting estimates are interpreted as associations within survey data because the design does not establish the temporal sequence required to demonstrate causation.

4.1 Target Population and Sampling

The sampling frame comprised 90 firms in Kenya's financial services sector: 43 commercial banks, nine microfinance institutions and 38 deposit-taking SACCOs. SACCOs were included where loans and advances met a KSh 3 billion threshold, which was intended to improve comparability in institutional size. A census approach was

used to invite all 90 qualifying firms. Within each firm, purposive sampling targeted the board chairperson, CEO and company secretary because their responsibilities positioned them to provide information on board resources and institutional decisions. The intended respondent total was therefore 270, comprising three respondents per institution. The census concerned institutions, while the purposive selection concerned individual respondents. The achieved analysis consisted of 164 usable questionnaires after screening the returned responses.

4.2 Data Collection, Validity, and Reliability

Primary data were collected using questionnaires. Board human capital was represented by board education, experience and functional diversity. Board social capital was represented by interlocks, prestige and directors' relationships with the CEO. CEO green efficacy represented perceived capacity to lead environmental initiatives, while green finance adoption was the outcome variable. The human-capital dimensions and CEO efficacy were summarised using scores with a reported range of one to five. The adoption measure was reported in proportion form. These measurement levels were retained when presenting descriptive findings so that adoption scores were distinguishable from the governance ratings.

Questionnaire pretesting involved ten small and medium enterprises (SMEs) in Thika. Face validity was assessed, and reliability testing used Cronbach's alpha in the Statistical Package for the Social Sciences (SPSS) with 0.70 as the stated acceptance criterion. Pretesting is useful for identifying difficulties in wording and administration. However, testing an instrument among SMEs provides a limited basis for judging its suitability for board chairpersons, CEOs and company secretaries in regulated financial institutions. The relevance of the items to the intended organisational roles therefore remains important when evaluating the measurement quality. The reliability criterion describes the standard used for assessment and does not, by itself, demonstrate that each construct meets that standard.

4.3 Data Analysis and Model Specification

Data preparation involved coding, entry, screening and cleaning in SPSS. Descriptive analysis summarised response counts, percentages, means, standard deviations, skewness and kurtosis. Pearson correlation was used to examine associations with green finance adoption. Multiple regression assessed the human-capital and social-capital dimensions in separate models. Hierarchical regression examined whether selected relationships changed with CEO green efficacy. The model distinction is important because the explanatory power of the human-capital regression applies to that model and cannot be assigned to a pooled model containing all six dimensions.

The direct-effect models were represented as follows:

$$GF_i = \alpha_H + b_1 BED_i + b_2 BEX_i + b_3 BFD_i + \varepsilon_i$$

$$GF_i = \alpha_S + b_4 BIL_i + b_5 BPR_i + b_6 BCR_i + \varepsilon_i$$

In these expressions, GF denotes green finance adoption; BED, BEX and BFD denote board education, experience and functional diversity; and BIL, BPR and BCR denote interlocks, prestige and directors' relationships with the CEO. Each model has an intercept, regression slopes and an error term. The subscript *i* identifies an observation. These specifications distinguish the two sets of direct relationships.

Moderation was represented by a model containing the predictor, CEO green efficacy and their interaction:

$$GF_i = \alpha + b_X X_i + b_M M_i + b_{XM} X_i M_i + \varepsilon_i$$

Here, X represents the board-capital dimension under examination and M represents CEO green efficacy. The interaction coefficient describes how the relationship between X and adoption changes with the moderator. A significant interaction provides evidence of moderation, while the change in R^2 indicates the additional variation explained at the relevant hierarchical step (Hayes, 2022). The examined interactions involved education, experience, functional diversity and interlocks. No combined interaction effect was inferred from the separate tests.

5. Findings

5.1 Response Rate

Table 1 presents the questionnaire response. Of the 270 questionnaires distributed, 211 were returned, representing 78.15%. Fifty-nine questionnaires were not returned. Screening excluded 47 returned questionnaires, leaving 164 usable responses, equivalent to 60.74% of those distributed and 77.73% of those returned. These figures distinguish the return rate from the rate of usable responses. The latter describes the records retained for analysis and provides the relevant basis for interpreting the descriptive results. Since respondents were selected within institutions, the questionnaire return rate should not be treated as a measure of the proportion of firms represented.

Table 1. Questionnaire Response

Questionnaire status	Number
Distributed	270
Returned	211
Not returned	59
Excluded after screening	47
Usable for analysis	164

5.2 Descriptive Statistics

Table 2 presents the descriptive statistics. Green finance adoption had a mean score of 0.390 and an observed range of 0.120 to 0.640. The mean indicates that adoption levels were below the upper end of the reported scale, while the range shows differences across responses. Board functional diversity had the highest mean among the governance ratings ($M = 4.323$, $SD = 1.213$), followed by board education ($M = 3.957$, $SD = 0.800$). Board experience had a mean of 2.965 ($SD = 1.155$), suggesting comparatively lower ratings for this dimension. CEO green efficacy had a mean of 3.478 ($SD = 1.133$), indicating a tendency towards scores above the midpoint of the one-to-five range, alongside variation among respondents.

Table 2. Descriptive Statistics

Variable	Min.	Max.	Mean	SD	Skewness	Kurtosis
Green finance adoption	0.120	0.640	0.390	— ^a	−0.745	0.074
Board education	1	5	3.957	0.800	−0.898	2.066
Board experience	1	5	2.965	1.155	−0.135	−0.769
Board functional diversity	1	5	4.323	1.213	−1.834	2.182
CEO green efficacy	1	5	3.478	1.133	−0.553	−0.319

Note. $n = 164$. SD = standard deviation. Adoption scores are reported in proportion form; the other rows use scores from one to five. ^a The reported adoption SD of 0.411 is inconsistent with the range 0.120–0.640 and is excluded from interpretation pending verification.

The negative skewness values indicate that responses tended towards the higher ends of the respective distributions. Functional diversity had the most pronounced negative skewness (−1.834), while experience was comparatively more balanced (−0.135). Education and functional diversity also had positive reported kurtosis values of 2.066 and 2.182. These distributional features provide context for the mean scores. They do not show that boards had particular qualifications or professional combinations because the ratings summarise the measured constructs. Similarly, the descriptive adoption score cannot explain why one institution adopts more green finance practices than another. The correlation and regression analyses address the relationships between the measured variables.

5.3 Assumptions

The reported regression diagnostics are summarised in Table 3. Kolmogorov–Smirnov and Shapiro–Wilk p -values were above .05, ranging from .200 to .611 for the tests reported. The linearity analysis showed significant linear components, with $p < .001$. Variance inflation factor (VIF) values ranged from 1.391 to 2.883 and tolerance values from .347 to .719, suggesting that collinearity was not severe among the predictors covered by those diagnostics. Levene’s test produced p -values between .069 and .232, indicating no statistically significant group variance differences under that test.

Table 3. Reported Regression Diagnostics

Assessment	Test	Reported result
Normality	Kolmogorov–Smirnov and Shapiro–Wilk	$p = .200$ to $.611$
Linear component	Analysis of variance (ANOVA) for linearity	$p < .001$
Collinearity	Variance inflation factor	VIF = 1.391 to 2.883
Collinearity	Tolerance	Tolerance = .347 to .719
Equality of group variances	Levene’s test	$p = .069$ to $.232$

Note. These results describe the reported checks. Their implications for residual normality, regression error variance and independence are considered in the accompanying text.

These checks support further examination of the regression estimates, with qualifications about what each test establishes. A significant linear component does not exclude additional nonlinear relationships. Levene’s test assesses equality of group variances and is not a complete assessment of whether regression error variance

changes with fitted values. Normality relevant to conventional regression inference concerns the errors, so tests of measured variables alone cannot establish residual normality. The diagnostics should therefore be read alongside residual plots and appropriate checks on the fitted models. Possible dependence between respondents from the same institution is a further consideration for the precision of the estimates.

5.4 Correlation Analysis

Table 4 shows the reported Pearson correlations with green finance adoption. Board education had the strongest reported correlation ($r = .848$, $p < .01$), closely followed by functional diversity ($r = .842$, $p < .01$). Board experience also had a strong positive relationship ($r = .793$, $p < .01$). CEO green efficacy had a positive correlation of .545 ($p < .01$). These results show that higher scores on the four variables were associated with higher adoption scores. The correlations are bivariate relationships and do not identify each variable's contribution after accounting for other predictors. The positive association involving CEO green efficacy also does not itself demonstrate moderation, which requires testing interaction terms.

Table 4. Correlations with Green Finance Adoption

Variable	Pearson r	p
Board education	.848	< .01
Board experience	.793	< .01
Board functional diversity	.842	< .01
CEO green efficacy	.545	< .01

Note. The correlations are bivariate associations with adoption. They are distinct from the interaction estimates used to assess moderation.

5.5 Hypotheses Testing

Board human capital. Table 5 presents the direct relationships involving education, experience and functional diversity. Education had a positive and statistically significant coefficient ($\beta = 0.421$, $p < .001$), supporting H1a. Experience also had a positive and significant coefficient ($\beta = 0.154$, $p < .001$), supporting H1b. Functional diversity had a positive and significant coefficient ($\beta = 0.439$, $p < .001$), supporting H1c. The findings show that the three measured human-capital dimensions were associated with adoption within the human-capital model. Functional diversity and education had larger reported coefficients than experience, although this comparison concerns coefficients within the stated model and does not establish the effect of changing board appointments.

Table 5. Board Human Capital Regression Results

Hypothesis	Predictor	β	p	Decision
H1a	Board education	0.421	< .001	Supported
H1b	Board experience	0.154	< .001	Supported
H1c	Board functional diversity	0.439	< .001	Supported

Note. Outcome: green finance adoption. $R^2 = .849$ for the human-capital model. β denotes the reported regression coefficient. Values shown as .000 in the regression summary are presented as $p < .001$.

The human-capital model had $R^2 = .849$, indicating that it explained 84.9% of the variation in the adoption measure within the analysed observations. This is substantial

explanatory power for that model. It should be interpreted together with the measurement approach and survey design, since a high R^2 does not demonstrate causal effects or guarantee prediction in other institutions. The explanatory power also does not represent the result of a joint regression containing both human and social capital. The coefficient findings support the proposed positive associations while leaving other possible institutional explanations open to further investigation.

Board social capital. Table 6 presents the direct social-capital findings. Board interlocks had a positive and significant coefficient ($\beta = 0.300$, $p < .01$), supporting H2a. Board prestige also had a positive and significant coefficient ($\beta = 0.290$, $p < .01$), supporting H2b. Directors' relationships with the CEO had a negative and significant coefficient ($\beta = -0.170$, $p = .01$). This supports the nondirectional H2c and shows that the relationship operated negatively within the reported social-capital model. The finding indicates that the three social-capital dimensions should not be interpreted as interchangeable governance advantages. The observed signs differ, and the result for CEO relationships needs to be considered in relation to the specific construct measured.

Table 6. Board Social Capital Regression Results

Hypothesis	Predictor	β	p	Decision
H2a	Board interlocks	0.300	< .01	Supported
H2b	Board prestige	0.290	< .01	Supported
H2c	Directors' relationships with the CEO	-0.170	= .01	Supported

Note. Outcome: green finance adoption. H2c is nondirectional and is supported by the significant negative coefficient. The .00 p-values for interlocks and prestige are conservatively presented as $p < .01$, reflecting their reporting precision.

The positive interlock association is consistent with a possible contribution from external knowledge and professional connections. The prestige association suggests that recognised standing may be relevant to adoption decisions. The negative coefficient for directors' relationships with the CEO suggests a possible governance concern where relationships limit independent scrutiny. These explanations are interpretations of the estimated associations. The regression does not directly demonstrate knowledge transfer, stakeholder confidence or weakened oversight, and it does not imply that every board–CEO relationship has a negative consequence.

CEO green efficacy. Table 7 presents the hierarchical regression findings. The interaction between board education and CEO green efficacy was positive and significant ($\beta = 0.450$, $p < .001$), with $\Delta R^2 = .046$. This supports H3a and indicates that the education–adoption association became more positive as CEO green efficacy increased. The reported R^2 change corresponds to 4.6 percentage points of additional explained variation at the relevant step. The interaction between experience and efficacy was not statistically significant ($\beta = 0.040$, $p > .05$), and the interaction involving functional diversity was also not significant ($\beta = 0.050$, $p > .05$). H3b and H3c were therefore not supported. Their R^2 changes were reported as .000 at the stated precision.

Table 7. Moderating Role of CEO Green Efficacy

Hypothesis	Interaction with CEO green efficacy	β	p	ΔR^2	Decision
H3a	Board education	0.450	< .001	.046	Supported
H3b	Board experience	0.040	> .05	.000	Not supported
H3c	Board functional diversity	0.050	> .05	.000	Not supported
H4	Board interlocks	0.580	< .05	.019	Supported

Note. Outcome: green finance adoption. ΔR^2 denotes the reported change at the relevant hierarchical step for each test. The changes belong to separate tests and are not added together. A change displayed as .000 is rounded to three decimals.

The interlocks–efficacy interaction was positive and significant ($\beta = 0.580$, $p < .05$), with $\Delta R^2 = .019$. This supports H4 and indicates a stronger positive interlock association at higher levels of CEO green efficacy. The incremental explained variation was 1.9 percentage points. Together, the results show selective moderation: CEO efficacy was relevant to the education and interlock relationships, while the experience and functional diversity interactions were not statistically significant. The positive interaction estimates support the direction of change in the associations. They do not provide conditional effects at particular efficacy values without the corresponding main-effect estimates and further probing. The non-significant interactions also do not negate the positive direct associations involving experience and functional diversity.

6. Discussion of the Findings

The positive education finding suggests that board knowledge is relevant to green finance adoption in the studied financial institutions. It is consistent with Nathalia and Setiawan's (2022) evidence linking board education to climate change disclosure and with the broader expertise finding reported by Raimo et al. (2025). The present outcome concerns adoption, so it extends the discussion from environmental reporting to financing-related organisational practices within the study setting. A plausible interpretation is that educated directors are better positioned to assess complex proposals and question information presented to them. The association does not identify which qualifications matter most, and it therefore supports attention to relevant competencies rather than a universal requirement for a particular academic credential.

Board experience also showed a positive relationship with adoption. This suggests that accumulated professional judgement can be relevant to environmental financing decisions. The interpretation is compatible with the agency perspective, under which directors need sufficient understanding to evaluate management proposals. Its smaller reported coefficient relative to education and functional diversity does not make experience unimportant. It indicates that the dimensions had different associations within the model. The results do not reveal whether financial-sector experience, environmental experience or general board service contributed most, so recruitment and training decisions should consider the relevance of experience to the institution's actual financing priorities.

Functional diversity had a positive association with adoption and the highest mean among the governance ratings. The result is consistent with the proposed value of examining environmental decisions from several professional perspectives. Wang (2022) also shows that the benefits of diverse board resources depend on how directors work together. For the present institutions, diversity may broaden the information

considered during decision making, but the regression did not directly test deliberation quality or collaboration. The finding supports the inclusion of complementary expertise while leaving the practical organisation of board work as a separate governance consideration.

The interlock and prestige findings indicate that external relationships and recognised standing may contribute to adoption. The interlock result is consistent with Lu et al. (2024), who link sustainability experience gained through other boards with transparent disclosure. In this study, external appointments may provide opportunities to encounter relevant knowledge, although their value depends on what directors bring back to the focal institution. Prestige may help a board engage stakeholders and establish professional credibility for environmental initiatives. Since prestige was measured separately, the finding adds a dimension that broader board-capital measures may conceal. Neither result establishes that more appointments or higher public recognition will always improve adoption.

The negative association involving directors' relationships with the CEO brings independent oversight into the discussion. It is compatible with the agency concern that governance resources may be less effective where executive influence limits challenge. Muttakin et al. (2018) similarly identify circumstances in which CEO power reduces the contribution of board capital to CSR disclosure. CEO power is different from the relationship construct tested here, so the findings should not be treated as equivalent. The present result supports examining the professional boundaries within which board–CEO communication occurs. It does not demonstrate that cordial working relationships caused lower adoption, because the relevant behavioural mechanisms were not separately tested.

CEO green efficacy strengthened the education and interlock relationships. A plausible explanation is that board knowledge and external information become more useful when executive leadership feels capable of pursuing environmental initiatives. Faris et al. (2025) provide evidence for the relevance of green self-efficacy to green innovation, although their employee-level mediation setting differs from this CEO-level moderation test. The current results show that efficacy did not significantly alter every human-capital relationship. Experience and functional diversity retained positive direct associations even though their interactions were not significant. This selective pattern is consistent with examining specific combinations of board resources and leadership conditions, as emphasised by Remo-Diez et al. (2025), while keeping CEO efficacy distinct from CEO power.

Interpretation of these findings remains subject to the survey and measurement approach. Responses may reflect perceptions rather than independently verified financing outcomes, and collecting several constructs through questionnaires can create shared-method influences. Respondents selected from the same institution may also provide related observations. The available associations consequently provide a basis for further institution-level investigation, including consideration of robust or clustered standard errors where the analysis retains individual respondents. The SACCO eligibility threshold also limits direct application to smaller institutions. Future research can strengthen the evidence through longitudinal designs, independent adoption measures and more detailed examination of the content of board expertise and external relationships.

7. Conclusions

The study concludes that both board human and social capital are relevant to green finance adoption among the financial institutions examined in Kenya. Education, experience and functional diversity were positively associated with adoption in the human-capital model. Interlocks and prestige also showed positive associations in the social-capital model, while directors' relationships with the CEO showed a negative association. The different signs indicate that the contribution of board capital depends on the dimension considered. Board qualifications and connections therefore need to be examined alongside the quality of governance relationships through which directors exercise their responsibilities.

CEO green efficacy strengthened the relationships involving education and interlocks, but its interactions with experience and functional diversity were not statistically significant. The results suggest that executive confidence in environmental initiatives is particularly relevant to the use of board knowledge and external connections. They support a view of green finance adoption that considers board resources together with implementation leadership and independent oversight. These conclusions concern associations in the analysed survey data and do not establish that changes in board composition or CEO efficacy will cause equivalent changes in adoption.

8. Recommendations

Financial institutions should assess the relevance of directors' education and professional experience to their green finance priorities. Nomination and development processes can consider whether directors can interpret environmental information, evaluate financing proposals and question the assumptions underlying them. Board development should include practical learning about environmental risk and the assessment of green financing opportunities. For banks, the CBK guidance and the Kenya Green Finance Taxonomy provide relevant material for this learning (CBK, 2021, 2025). The study supports strengthening competence, while the specific qualification requirements should reflect institutional responsibilities and the evidence available about directors' actual contributions.

Institutions should maintain a mix of professional backgrounds that supports the assessment of environmental financing proposals. Boards can review whether their existing expertise covers the financial and operational questions raised by intended initiatives, and address identified gaps through appointments or development. Directors with useful external connections and professional standing should be considered where those resources are relevant to institutional strategy. Interlocks should be assessed for their potential to provide applicable knowledge and for directors' capacity to fulfil their responsibilities. Professional recognition should similarly be considered alongside the substance of a director's expertise and contribution.

Boards should preserve independent oversight in their relationships with CEOs. Clear decision procedures, documented assessments and opportunities for directors to challenge proposals can support professional cooperation without limiting scrutiny. Institutions can also develop CEO green efficacy through practical exposure to environmental financing decisions, relevant training and feedback on implementation. Such development should be connected to actual responsibilities and resources so that confidence is supported by capability. The selective moderation results justify particular attention to how CEOs use board knowledge and respond to opportunities identified through external connections.

Further research should examine green finance adoption using independently verified institutional indicators and designs that establish the timing of changes in board resources and adoption. Studies can assess whether sustainability-specific education and experience differ from general qualifications and tenure. Additional work should investigate the content of directors' relationships with CEOs and test the behavioural explanations proposed for the negative association. Institution-level analyses and appropriate treatment of responses clustered within firms would strengthen inference. Further examination of interaction effects, including conditional slopes, would help identify the efficacy levels at which board resources have different associations with adoption.

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